CITY OF TORONTO

TORONTO PARAMEDIC SERVICES
D6 RENOVATION

610 BAY STREET TORONTO ONTARIO

VOLUME 1 · ARCHITECTURAL SPECIFICATIONS

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END OF SECTION

PART 1 - GENERAL

1.1 Division One Requirements

1.1.1 The provisions of all Sections of Division One shall apply to each section of the Specifications, including those of Mechanical (Division 15) and Electrical (Division 16).

1.1.2 The provisions of the Bid Forms and Supplements: *City of Toronto* Front End Documents shall apply to each section of the Specifications, including those of Mechanical (Division 15) and Electrical (Division 16).

1.2 City of Toronto Schedule Requirements

1.2.1 The schedule must adhere to the *City of Toronto's* restrictions regarding hours of work, and is to be approved by the *City of Toronto* prior to commencement of work. Update schedule as required or requested by the *City of Toronto* Project Manager to ensure accuracy of project deliverables. Refer to related specification section 01 32 16 Construction Progress Coordination.

1.3 Subdivision of Work

1.3.1 The Specifications have generally been divided into trade divisions, and the trade divisions into sections for the purpose of ready reference, but a section may consist of more than one Subcontractor or supplier. The responsibility for determining which Subcontractor or Supplier provided labour, materials, products, equipment and services to complete the work rests solely with the Contractor.

1.4 Discrepancies and/or Omissions

1.4.1 If the Contractor finds discrepancies in, or omissions from the Drawings, Specifications or other Contract Documents or has any doubt as to the meaning or intent of any part thereof the Consultant shall be notified at once. The Consultant will send written instructions or explanations. Neither the Owner nor the Consultant will be responsible for oral instructions.

1.4.2 If the Contractor finds discrepancies in, or omissions from the Bid Forms and Supplements: *City of Toronto* Front End Documents, or has any doubt as to the meaning or intent of any part thereof the Consultant shall be notified at once. The Consultant will send written instructions or explanations. Neither the Owner nor the Consultant will be responsible for oral instructions.

1.5 Examination

1.5.1 Make a careful examination of the site of the project, and investigate and be satisfied as to all matters relating to the nature of the work to be undertaken, as to the means of access and egress thereto and there from, as to the obstacles to be met with, as to the rights and interests which may be interfered with during the construction of the work, as to the extent of the work to be performed and any and all matters which are referred to in the Drawings, Specifications and other Contract Documents, or which are necessary for the full and proper understanding of the work and the conditions under which it will be performed.

1.5.2 No allowance shall be made subsequently in this connection on behalf of the Contractor for any error or negligence on its part.

1.5.3 Before commencing the work of any Section, the work of other Sections upon which it may depend, shall be carefully examined. Report any defects which might affect the new work in writing to the Consultant. Commencement of new work shall imply acceptance of all work by other Sections upon which the new work depends.

1.6 Coordination of Other Contractors' Work

1.6.1 Cooperate with and correlate and coordinate this work with that of Other Contractors who may have separate contracts with the Owner, in order to complete the work as expeditiously as possible.

1.6.2 Prior to commencement of work, ensure that all Other Contractors are fully conversant with the extent of the Work, the conditions and materials on the project, the schedule of completion, restrictions to safety, and to access. Also ensure that all Subcontractors are fully conversant with the extent of work involved with Other Contractors.

1.6.3 Conform to the requirements of the Consultant whenever activities will effect the ongoing business in the existing building and give at least 48 hours notice in advance of starting any work in the existing building.

1.7 Building Dimensions and Coordination

1.7.1 Ensure that all necessary job dimensions are taken and all trades are coordinated for the proper execution of the work. Assume complete responsibility for the accuracy and completeness of such dimensions, and for coordination.

1.7.2 Verify that all work, as it proceeds, is executed in accordance with dimensions and positions indicated which maintain levels and clearances to adjacent work, as set out by requirements of the drawings, and ensure that work installed in error is rectified before construction resumes.

1.7.3 Check and verify all dimensions referring to the work and the interfacing of all services. Verify with the trade concerned all dimensions, when pertaining to the work of other trades. Be responsible to see that Subcontractors for various trades cooperate for the proper performance of the Work.

1.7.4 Avoid scaling directly from the drawings. If there is ambiguity or lack of information, immediately inform the Consultant. Be responsible for any change through the disregarding of this clause.

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

1.7.6 Advise Consultant of discrepancies and if there are omissions on drawings, particularly reflected ceiling plans and jointing patterns for paving, ceramic tile, stone tile or carpet tile layouts, which affect aesthetics, or which interfere with services, equipment or surfaces. DO NOT PROCEED without direction from the Consultant.

1.7.7 Ensure that each Subcontractor communicates requirements for site conditions and surfaces necessary for the execution of the Subcontractor's work, and that he provides setting drawings, templates and all other information necessary for the location and installation of material, holes, sleeves, insets, anchors, accessories, fastenings, connections and access panels. Inform other Subcontractors whose work is affected by these requirements and preparatory work.

1.7.8 Prepare interference drawings to properly coordinate the work where necessitated. Refer to Section 01 33 23.

1.8 Labels and Nameplates

1.8.1 Do not install permanent or permanently-attached labels, trademarks, and nameplates in visible locations on materials and components, unless required for operating instructions or by Jurisdictional Authorities.

1.9 Use of Premises Before Substantial Performance

1.9.1 The Owner shall have the right to enter the work space, in whole or in part, for the purpose of placing fittings and equipment, or for other use, before completion of the Contract if, in the opinion of the Consultant, such entry and occupancy does not prevent or interfere with the Contractor in the performance of the Contract. Such entry shall in no way be considered as an acceptance of the Work in whole, or in part, nor shall it imply acknowledgement that terms of the Agreement are fulfilled.

1.10 Regulatory Requirements

1.10.1 Minimum Standard: Unless reference is made in the Contract Documents to other standards, all work shall conform to or exceed the minimum applicable standards of The 2012 Ontario Building Code, and/or the governing Jurisdictional Authorities.

1.10.2 Laws and Regulations: Comply with all applicable statutes, laws, by-laws, regulations, ordinances and orders whether Federal, Provincial, Municipal or otherwise, at any time in effect during the duration of this Contract, and all rules and requirements of the Police and Fire departments, or other governmental authorities, and all C.S.A. approvals, where required.

1.10.3 Construction Safety: Include all provisions for construction safety, such as fences, barricades, bracing supports, storage facilities, sanitation facilities, fire protection, standpipes, electrical supply, temporary heat, steam supply, ventilation, construction equipment with its supports and guards, stairs, ramps, platforms, runways, ladders, scaffolds, guardrails, temporary flooring, rubbish chutes, walkway lighting, and morality lighting, all as required by the Occupational Health and Safety Act, and amendments thereto and the Fire Code Ontario Regulation 388/97 as well as all other applicable regulations of Jurisdictional Authorities.

1.11 Examination Before Execution of Work

1.11.1 Make good defects in the Work on which further execution of work depends.

1.11.2 Verify dimensions of prepared work before fabrication of that work which is dependent on the prepared work.

1.11.3 Do not proceed with the execution of the work unless the work which is to receive it and site conditions are satisfactory. Commencement of all work of all sections shall imply that prepared work and site conditions are satisfactory.

1.12 Specification Reference to Standards and Codes

1.12.1 Where reference is made to published standards and codes, such references shall be considered to refer to the latest edition (revision) approved by the organization issuing that publication, which is current at the date of this Specification.

1.13 Local Labour and Fair Wages

1.13.1 Wherever possible, the Contractor shall give preference to the use of local labour, building mechanics, suppliers and subtrades. Rates of wages, hours and conditions of work of persons employed on the work shall be in accordance with Provincial Codes, and as generally recognized and accepted in the locality.

1.14 Locating Services Prior to Placing of Slabs

1.14.1 Record exact location of all services with dimensions to the Grid Lines and Datum Lines, and show on Record Drawings prior to placing concrete. DO NOT place concrete until this is done. Coordinate Mechanical, Electrical, and concrete trades.

1.15 Sleeving

1.15.1 Assess requirements for sleeving the structural elements for passing of pipes, conduits and other mechanical or electrical components, and include all work required for approved interfacing between the structure, all mechanical and electrical work, and other components of the work.

1.16 Concealing of Mechanical and Electrical Components

1.16.1 Include work required to modify indicated location of pipes, ducts, conduits, and other mechanical or electrical components to fully conceal such components from view in finished spaces.

1.17 Jurisdictional Requirements for Life and Fire Safety

1.17.1 Enforce all requirements established by Jurisdictional Authorities Code Bodies, Occupational Health and Safety Act, WHMIS Underwriters for life safety, fire prevention, and fire protection. Refer to additional requirements specified in Section 01701.

1.18 Materials, Equipment and Furniture Supplied by Owner

1.18.1 Where indicated the work may include installation of materials, equipment and/or furniture supplied by Owner during work of this Contract. Coordinate shipping and delivery with Owner. Provide protected storage on site for the materials, furniture and equipment. Do all work required to complete installation of equipment, in full operating condition, in accordance with manufacturer's directions. In the case of equipment which requires modification to suit new location, take measurements. Coordinate that equipment will fit into new location and make allowances in construction to accommodate the equipment. Provide new anchoring devices, rewire, modify or rework as required to suit new location.

1.18.2 In the case of equipment, furniture and materials that requires disconnection, removal and moving from an existing building at a different site, make arrangements to survey the equipment prior to its removal, arrange for all applicable tradesmen required to disconnect, dismantle, package and protect. Move to new location and reinstall in new facilities. Cap existing services, make good all existing surfaces and clean existing premises.

1.19 Imperial/International System of Units

1.19.1 Where measurements are indicated in both Imperial and International System of Units (SI), the (SI) System of Units will govern.

1.20 Work Not in Contract

1.20.1 Work not in this Contract (noted N.I.C. on drawings) shall be governed by Article GC 3.2 "Construction by Owner or Other Contractors" in the General Conditions.

1.21 Documents at Job Site

1.21.1 Maintain at job site, one copy each of the following and make same available to the Consultant upon request:

.1 Contract drawings.
.2 Specifications.
.3 Addenda.
.4 Reviewed shop drawings.
.5 Supplementary instruction.
.6 Change Orders.
.7 Other modifications to Contract.
.8 Field test reports.
.9 As-built record drawings.
.10 Copy of approved work schedule.
.11 Manufacturer's installation and application instructions.
.12 Ontario Building Code and Supplementary Guidelines to the Ontario Building Code.
.13 OHSA – construction.
.14 Minutes of meetings.
.15 MSDS information.

1.22 Smoking Restrictions

1.22.1 Smoking will not be permitted anywhere in the building. Any smoking shall take place outside the premises.

1.23 Posters, Photos, Calendars, and Pin-ups

1.23.1 Posters objectifying individuals, containing offensive content or similar material will not be allowed on site.

PART 2 - PRODUCTS

NOT USED

PART 3 - EXECUTION

NOT USED

END OF SECTION

VALUATION OF CHANGES TO WORK

PART 1 - GENERAL

1.1 **General**

1.1.1 Apply Unit, Separate, Itemized and Alternative Prices to Work if and as directed by the Consultant in accordance with the stipulations in this Section and the General Conditions of the Contract.

1.1.2 All unit prices described in this Section shall include the total cost of materials, labour, tools, equipment, fees, insurance, testing, preparation of drawings, submittals, calculations, supervision, inspections, deliveries, travelling, out-of-town accommodations, rentals, duties, taxes, head office and site office overheads, profits, and all other direct and indirect expenses required to fully perform the specified Work.

1.1.3 All Unit Prices shall be valid until the Total Performance of the Work.

1.1.4 All Separate, Itemized and Alternative Prices shall be valid until the latest possible date by which they could be implemented without affecting the date of Substantial Performance.

1.1.5 Changes to Work not covered by Unit, Itemized, Separate or Alternative Prices shall be established by using current labour rates, including mandatory benefits, prevailing local market prices of materials and/or equipment, taxes, specific fees related to the change only, and overhead costs as defined below.

1.2 **Overhead shall include all costs of:**

1.2.1 Operating head office and site facilities.

1.2.2 Head office and site personnel.

1.2.3 Custom duties, basic permits and other licences required by jurisdictional authorities.

1.2.4 Insurance.

1.2.5 Bonds.

1.2.6 All services defined in Sections 01 33 00 and 01 45 00.

1.2.7 Calculations, inspections, testing.

1.2.8 Deliveries, travelling, out-of-town accommodations.

1.2.9 Hand and small power tools required for the efficient completion of the Work.

1.3 **Unit Price**

1.3.1 Unit Prices submitted on appendices to Tender shall apply to any and all Work complete in place which can be measured in the specified units regardless of the variations in productivity and job conditions, or the time when instructions to carry out that Work will be issued.

1.3.2 Unit Prices shall apply only to the net change in quantities for each unit of Work in each change to the Work, provided that the instructions of a contemplated change have been given to the Contractor before the start of that Work and/or ordering of equipment.

1.3.3 After the Work covered by the applicable Unit Price has started, the Unit Price shall cover the new Work without any credit for Work already completed.

1.4 **Itemized Price**

1.4.1 An Itemized Price is included in the Stipulated Price, and could be deducted from it, in case the Work covered by that price will be, at Owner's choice, excluded from the Contract.

1.4.2 Submit Itemized Prices as requested in other Sections of the Specifications and/or on the Appendices to Tender.

1.5 **Separate Price**

1.5.1 A Separate Price covers Work not included in the Stipulated Price. At Owner's choice it can be rejected or accepted for incorporation into this Contract or carried out under a Separate Contract.

1.5.2 Submit Separate Prices as requested in other Sections of the Specifications and/or on the Appendices to Tender.

1.6 **Alternative Price**

1.6.1 An Alternative Price defines the net cost difference between two different materials, products or processes described in the Specifications and/or in the Appendices to Tender.

1.6.2 An Alternative Price for any work component identified as a second choice (an alternative) shall include all costs required to modify related and surrounding Work so that the alternative could function properly.

1.6.3 The above mentioned modification shall be acceptable to the Consultant.

1.7 **Changes to Work**

1.7.1 Conform to the requirements of the General Conditions, and Section 01 33 00 for pricing contemplated and or changes to the Work.

1.7.2 Any costs related to preparation of the necessary documentation for changes/contemplated changes are deemed to be included in the specified overhead and profit.

PART 2 - PRODUCTS

NOT USED

PART 3 - EXECUTION

NOT USED

END OF SECTION

ALLOWANCES

1 GENERAL

1.01 REFERENCE STANDARDS

.1 City of Toronto Master Roster Agreement

.2 Request for Tender
  .1 Appendix B – Base Bid – Pricing Form

1.02 CASH ALLOWANCES

.1 Refer to City of Toronto Master Roster Agreement.

.2 Include in Contract Price specified cash allowances.

.3 Cash allowances, unless otherwise specified, cover net cost to Contractor of services, products, construction machinery and equipment, freight, handling, unloading, storage and installation and other authorized expenses incurred in performing Work.

.4 Contract Price, and not cash allowance, includes Contractor's overhead and profit in connection with such cash allowance.

.5 Contract Price will be adjusted by written order to provide for excess or deficit to each cash allowance.

.6 Where costs under a cash allowance exceed amount of allowance, Contractor will be compensated for excess incurred and substantiated plus allowance for overhead and profit as set out in Contract Documents.

.7 Include progress payments on accounts of work authorized under cash allowances in Consultant's monthly certificate for payment.

.8 Prepare schedule jointly with Consultant and Contractor to show when items called for under cash allowances must be authorized by Consultant for ordering purposes so that progress of Work will not be delayed.

.9 List the amount of each allowance, for each work specified in each respective specification Section as follows:
  .1 Electrical Specifications [E-0.1] include allowance of $ 10,000 for purchase and installation of Security Cameras and associated Equipment.

1.03 CONTINGENCY ALLOWANCE

.1 Contingency Allowance is for additional work requested and authorized, in writing, by COT Project Management. To be Determined

2 PRODUCTS

2.01 NOT USED

.1 Not Used.

3 EXECUTION

3.01 NOT USED

.1 Not Used.

END OF SECTION

PART 1 - GENERAL

1.1 **General**

1.1.1 Submit a Schedule of Values to the Consultant at least 10 days prior to submitting first Application For Payment.

1.1.2 Upon request by Consultant, support values given with data that will substantiate their correctness.

1.1.3 Submit quantities of designated materials.

1.1.4 Refer to the General Conditions of the contract for details of payment procedure.

1.1.5 Schedule of Values will be used only as basis for Contractor's Application for payment.

1.1.6 Provide a line item in progress draws for interference drawings.

1.2 **Form of Submittal**

1.2.1 Submit typewritten Schedule of Values on 8½" x 11" white paper, in accordance with sample schedule included in this Section.

1.2.2 Use Table of Contents of this Specification as basis for the order for listing costs of work for sections under Division 2-16.

1.2.3 Identify each line item with number and title as listed in Table of Contents of this Specification.

1.3 **Preparing Schedule of Values**

1.3.1 Itemize separate line item cost for each of the following general cost items:

.1 Performance Bond.

.2 Field Supervision and Layout.

.3 Temporary Facilities and Controls.

.4 Building Permits, Sewer Levies, Etc.

1.3.2 Subdivide costs of products to be installed during several stages of construction into separate line items under each section listing.

1.3.3 Break down installed costs into:

.1 Delivered cost of product, with taxes paid.

.2 Total installed cost, with overhead and profit.

1.3.4 Make sum of total costs of all items listed in schedule equal to total contract sum.

1.4 **Preparing Schedule of Unit Material Values**

1.4.1 Submit separate schedule of unit prices for materials to be stored for which progress payments may be claimed.

1.4.2 Make form of submittal parallel to Schedule of Values, with each line item identified same as line item in Schedule of Values.

1.4.3 Include in unit price only:

.1 Cost of material.

.2 Delivery and unloading at site.

.3 Sales taxes.

1.4.4 Make sure that unit prices multiplied by quantities given equal material cost of that item in Schedule of Values.

1.5 **Review and Resubmittal**

1.5.1 After review by Consultant, revise and resubmit Schedule (and Schedule of Material Values), as required.

1.5.2 Resubmit revised schedule in same manner.

SCHEDULE OF VALUES

PROGRESS APPLICATION NO._____

Project_____ No._____ Requisition No._____ Month _____ 21
From _____ Date _____,20

Work Description	Original Contract Amount	Previous Progress Applications		This Progress Applications		Total Applications To Date		Balance on Contract	
		%	$	%	$	%	$	%	$
Division 1 - General Requirements									
General Conditions (Inc. Winterworks)									
Survey & Field Engineering									
Supervision & Administration									
Sub Totals									
Division 2 - Site Works									
Site Clear & Strip									
Excavations, Cut & Fill									
Trenching									
Weeping Tiles									
Underfloor Granular									
Final Grading									
Site Utilities - Storm, Water, Sanitary									
Sidewalks, Curbs & Concrete Paving									
Asphalt Paving									
Line & Pavement Markings									
Landscaping - Hard & Soft									
Sub Totals									

SCHEDULE OF VALUES

Work Description	Original Contract Amount	Previous Progress Applications		This Progress Applications		Total Applications To Date		Balance on Contract	
Division 3 - Concrete									
Concrete Supply									
Formwork - Place & Finish									
Tower Crane Rental									
Slab Hardener & Sealer									
Reinforcing Steel									
Welded Wire Mesh									
Misc. Concrete & Sundries									
Precast Stairs									
Architectural Precast Cladding									
Sub Totals									
Division 4 - Masonry									
Masonry									
Division 5 - Metals									
Structural Steel									
Steel Roof Deck									
Misc. Metals									
Stairs and Railings									
Sub Totals									
Divisions 6 to 16 - Similar									

END OF SECTION

PART 1 - GENERAL

1.1 Project Meetings for Coordination

1.1.1 In consultation with the Consultant during the second week of construction, arrange for site meetings weekly or every 2 weeks as appropriate to the stage of construction, for project coordination. Such meetings shall fall at the same time each week the meeting is scheduled.

1.1.2 Responsible representatives of the Contractor's and Subcontractor's office and field forces and suppliers shall be obliged to attend.

1.1.3 Inform the Owner, Consultant, and those others whose attendance is obligatory, of the date of each meeting, in sufficient time to ensure their attendance.

1.1.4 Provide physical space for meetings and chair meetings.

1.1.5 Consultant to record, prepare, and distribute minutes of each meeting. Draft minutes of meeting will be distributed within 48 hrs of meeting for comments/corrections from attendees. Final meeting minutes to be distributed within five (5) days of meeting.

1.2 Preconstruction Meeting

1.2.1 Within 5 days after award of Contract, request a meeting of parties in contract to discuss and resolve administrative procedures and responsibilities.

1.2.2 Include in the agenda the following:

.1 Appointment of official representative of participants in the Work.

.2 Scheduling of Work. Schedule to include a detailed breakdown of mechanical and electrical works.

.3 Interference with ongoing business.

.4 Work by other Contractors.

.5 Schedule of submission of shop drawings and samples.

.6 Requirements for temporary facilities, site sign, offices, storage sheds, utilities.

.7 Delivery schedule of specified equipment.

.8 Site security.

.9 Contemplated change notices, change orders, procedures, approvals required, mark-up percentages permitted, time extensions, overtime, administrative requirements.

.10 Record drawings.

.11 Maintenance manuals.

.12 Take-over procedures, acceptance, warranties.

.13 Monthly progress claims, administrative procedures, and holdbacks.

.14 Appointments of inspection and testing agencies or firms.

.15 Transcript of insurance policies.

.16 Schedule for progress meetings.

.17 Establish lines of communication.

1.3 **Project Meetings for Progress of Work**

1.3.1 Conduct progress meetings in accordance with the schedule and/or decisions made at Preconstruction meeting.

1.3.2 Include in the agenda the following:

.1 Review, approval of minutes of previous meeting.

.2 Review of Work progress since previous meeting.

.3 Field observations, problems, conflicts.

.4 Problems which impede construction schedule.

.5 Review of off-site fabrication delivery schedules.

.6 Corrective measures and procedures to regain projected schedule.

.7 Revisions to construction schedule.

.8 Progress during succeeding work period.

.9 Review submittal schedules: expedite as required.

.10 Maintenance of quality standards.

.11 Pending changes and substitutions.

.12 Review proposed changes for effect on construction schedule and on completion date.

.13 Other business.

1.4 **Progress Records**

1.4.1 Maintain a permanent written record on the site of the progress of the work using standard OGCA form. This record shall be available to the Consultant at the site, and a copy shall be furnished to same on request. The record shall contain:

.1 Dates of the commencement and completion of stage or portion of the work of each trade in each area of the project.

.2 Work force on project daily per trade.

.3 Visits to site by personnel of Consultant, Jurisdictional Authorities and testing companies.

PART 2 - PRODUCTS

NOT USED

PART 3 - EXECUTION

NOT USED

END OF SECTION

CONSTRUCTION PROGRESS COORDINATION

PART 1 - GENERAL

1.1 General Requirements

1.1.1 Submit projected construction schedule for entire Work. Revise schedule when it cannot readily be related to the actual stage of construction.

1.2 City of Toronto Requirements

1.2.1 The schedule must adhere to the *City of Toronto's* restrictions regarding hours of work, and is to be approved by the *City of Toronto* prior to commencement of work. Update schedule as required or requested by the *City of Toronto* Project Manager to ensure accuracy of project deliverables.

1.3 Phases of Construction

1.3.1 The project will be constructed in a single phase.

1.4 Form of Schedules

1.4.1 Provide detailed schedule in MS Project format, including the critical path-phases and completion within period specified. Prepare in form of horizontal bar chart. Provide separate horizontal bar column for each trade or operation, or separate activity for each operation that can be completed independently of other operations or trades. Provide as follows:

.1 Order: Chronological order of beginning of each item of work.

.2 Identification: Identify each column by distinct graphic delineation.

.3 Horizontal Time Scale: Identify first workday of each week.

.4 Scale and Spacing: To allow space for updating.

.5 Minimum Sheet Sizing: 11" x 17".

1.5 Content of Schedules

1.5.1 Submit complete sequence of construction by activity, as follows:

.1 Shop Drawings - Submittal dates, dates reviewed copies will be required.

.2 Decision dates for products specified by allowances, selection of finishes and colours, etc.

.3 Fabrication and delivery lead time.

.4 Dates for beginning and completion of each element of construction, specifically: subcontractor work, equipment installations and equipment tests.

1.5.2 Identify work of separate floors or separate phases, or other logically grouped activities.

1.5.3 Show projected percentage of completion for each item of work as of first day of each month.

1.5.4 Submit separate sub-schedule showing submittals, review times, procurement schedules, and delivery dates.

1.5.5 Submit sub-schedules to define critical portions of entire schedule.

1.6 **Updating**

1.6.1 Show all changes occurring since previous submission of updated schedule.

1.6.2 Indicate progress of each activity and show completion dates.

1.6.3 Include major changes in scope, activities modified since previous updating, revised projections due to changes, and other identifiable changes.

1.6.4 Provide narrative report including discussion of problem areas, including current and anticipated delay factors and their impact; corrective action taken or proposed, and its effect; effect of change in schedules of any work being done by the Owner or other parties for him; and description of revisions (effect on schedule due to change of scope, revisions in duration of activities, and other changes that may affect schedule).

1.7 **Submittals**

1.7.1 Submit initial schedules within 15 days after date of Notice to Proceed. Consultant will review schedules and return review copy within 10 days after receipt. If required, resubmit within 7 days after return of review copy.

1.7.2 Submit periodically updated schedules, accurately depicting progress to first day of each month.

1.8 **Distribution**

1.8.1 Distribute copies of reviewed schedules to job-site file, subcontractors, and other concerned parties.

1.8.2 Instruct recipients to report any liability to comply and provide detailed explanation with suggested remedies.

PART 2 - PRODUCTS

NOT USED

PART 3 - EXECUTION

NOT USED

END OF SECTION

SUBMITTAL PROCEDURES

PART 1 - GENERAL

1.1 Submittals After Receipt of Notice to Proceed

1.1.1 Submit the following:

.1 Initial Construction Schedule in accordance with Section 01300, within 15 days of receipt of Notice to Proceed with Work.

.2 Contractor's Safety Policy.

1.2 Submittals Prior to First Payment Claim

1.2.1 Submit the following:

.1 Letter of Good Standing from Workplace Safety & Insurance Board (WSIB).

.2 Schedule of Shop Drawing and Sample Submission.

.3 Product delivery schedule.

.4 Estimate of Monthly Progress Claims.

.5 Breakdown of Progress Claim, to Consultant’s standard, as specified in Section 01 29 00, and mechanical and electrical divisions.

.6 Documentation required by OAA/OGCA Take Over Procedures Document No. 100.

1.3 Submittals During Progress of Construction

1.3.1 Submit the following during the course of construction:

.1 Construction Schedule updates.

.2 Report on any damage, on conditions or problems arising out of receipt of Owner's equipment on site.

.3 Samples

.1 Submit samples where specified in each applicable trade section of the Specifications. Unless specified otherwise make samples of adequate size to represent the material intended for use on this project.

.2 Where the degrees of marking or colour cannot be adequately shown in a single sample, submit a range of samples to show the extremes of colour and marking. Identify samples with project number, date, and name of Contractor. Materials used in building shall correspond to approved samples for quality, colour, texture, finish, and thickness.

.3 Submit two samples of each item required unless specified otherwise.

.4 Progress records in accordance with Section 01 31 19, and testing and inspection reports in accordance with Section 01 45 00.

.5 <u>As-built drawings versus Record drawings</u>

.1 Refer to Volume 3, “OAA OGCA As-Built and Record Drawings” 3 pages dated Oct 21, 2010

.6 <u>As-built Drawings</u>

.1 Maintain, as the work progresses, until project duration, 1 set of project As-built Drawings. The full size drawings shall be in white prints while the 8-1/2" x 11" detail drawing sheets shall be in photocopies.

.2 The General Contractor shall return the marked up hard copies and provide as-built drawings digitally produced (CADD) on a computer. Transfer all as-built information to CD's using CD ROM of tender documents provided by the Consultant. ACAD 2016 shall be the acceptable data file platform. Autocad drawings to maintain the layering standard used on the tendering drawings. Each CD shall be clearly labelled with the project name, drawing number (s), Contractor and/or Subcontractor names and the date submitted. Record accurately on the Record Drawings, all changes to the Contract Documents as constructed, such as Consultant/Engineer-originated changes, Contractor/Subcontractor-originated changes, Site Instructions, Supplementary Instructions, Addenda, instructions by correspondence and Jurisdictional Authority approvals. Carefully record location of concealed elements as required for future maintenance, alteration work, and building additions. Delete information made obsolete by changes, and accurately draw or duplicate instructions and indicate all changes listed herein. Refer to Mechanical and Electrical Specification Divisions for additional requirements.

.3 Clearly mark each of the project As-built Drawings "Project As-built Copy". Maintain in good condition. Make the File Copy available at all times for inspection or use by the Consultant.

.4 Keep the File As-built Drawings current and do not record irrelevant information. Do not permanently conceal any work until the required information has been recorded.

.5 Submit to the Consultant, the as-built drawings and 1 bound photocopy of the Drawing Detail Sheets with the application for Substantial Performance of the project.

.7 As-built Specifications: Submit updated Specifications with the application for Substantial Performance of the project. Specifications shall incorporate all changes listed in .2 herein. A copy of the modification(s) shall be cut and pasted on the revised page where space permits, or a copy of the revision bound into and superimposed on the revised page.

.8 Shop Drawings: Submit shop drawings in accordance with Section 01 33 23, and in accordance with Mechanical and Electrical Divisions of the Specifications.

.9 Keying Chart: Submit keying chart in accordance with Section 08 71 00.

.10 List of Paint Materials: Submit list of paint materials in accordance with Section 09 91 00.

.11 Material Safety Data Sheets: Submit Material Safety Data Sheets (MSDS) to Consultant where applicable for adhesives, paints, sealers, caulking compounds, primers and other off-gassing materials.

.12 Progress Billing

.1 Coordinate monthly progress billings with cost breakdown.

.2 Include gross and net values of both basic Work and approved changes completed during billing period.

.3 Include running totals of gross and net values of Work completed by the end of the billing period.

.4 When requesting Holdback Releases, identify separately the amount applicable to Change Orders.

.13 Pricing of Changes to Work

.1 For changes to work relating to solicited (CCN's issued) or unsolicited claims submit sufficiently detailed estimate sheets for a proper assessment to be made, showing initial and revised quantities of labour, material and equipment as applicable for all work required to be expedited by the Contractor and Subcontractor.

.2 The net difference of the above amounts shall be multiplied with applicable current labour rates including all mandatory benefits, and prevailing market prices of materials and/or equipment. In case the net difference is an increase to the Contract Price, the combined markup for profit and overhead defined in Supplementary Conditions may be added to that net difference. No combined mark-up for overhead and profit is applicable when the net difference is a decrease to contract price.

.3 Unit Prices must be used for valuation of changes where unit prices have been requested provided and agreed to in the contract. For changes to work for which Unit Prices have been included in the agreement, submit detail calculations of initial and revised quantities, the net difference between them and related Unit Prices.

.4 Submit copies of price submissions together with detailed backup information and substantiation simultaneously to Consultant, Owner, and other applicable Consultants.

1.4 **Submittals When Project is Substantially Performed**

1.4.1 Manufacturer's Data Book and Shop Drawings

.1 Provide the Owner with shop drawings and Manufacturer's Data Books at the completion of the Project.

.2 Shop drawings shall consist of two complete sets of final "REVIEWED" and "Reviewed as Modified" shop drawings, on which corrections have been recorded of changes made during fabrication and installation of unforeseen conditions. Do not include drawings which were noted "REVISE AND RESUBMIT".

.3 The Manufacturer's Data Book shall consist of two copies of soft, black, vinyl-covered loose leaf binders, to accommodate 8-½" x 11" sheets. Binders shall match in all dimensions. A title sheet labelled "Manufacturer's Data

Book" with project name, date and list of contents shall precede data. Organize required material into applicable sections of work. Each section shall be marked by labelled tabs protected with celluloid covers fastened to hard paper dividers.

.4 The Manufacturer's Data Book shall contain:

.1 Equipment and operating instructions on all operable equipment and on all mechanical and electrical equipment, plumbing fixtures, and architectural hardware. Notes shall be typed. Drawings shall be neatly drafted and inked, or white-printed. Refer to Divisions 15 and 16 for additional requirements.

.2 Maintenance instructions.

.3 Original brochures on all equipment.

.4 Parts lists on all equipment including a list of suppliers.

.5 All additional material used in the project beyond that indicated by brochures listed under the various sections, showing manufacturers and sources of supply.

.6 Names, addresses and telephone numbers of the designer(s) and major contractor(s) who worked on the building.

.7 Commissioning data such as air and water flows and regulating valve positions.

1.4.2 Laboratory and Inspection Reports: Submit to the Consultant, in accordance with the technical Sections of the Specifications.

1.4.3 Extra Materials: Provide the Owner with extra materials for future maintenance use, as specified in the technical Sections of the Specifications.

1.4.4 Fixture Suspension Certificate: Submit to the Consultant a certificate from independent inspection company.

1.4.5 Sprinkler Installation Certificate: Submit to the Consultant certificates of tests required by NFPA 13.

1.4.6 Plumbing, Heating and Building Inspection Certificates: Submit to the Consultant certificates of Plumbing, Heating and Building Inspection.

1.4.7 Engineer's Certification: Where the documents require the seal of a registered Professional Engineer engaged by the Contractor, the Engineer(s) in question shall be responsible for providing certification as required by the Ontario Building Code or as required by the specifications, stating that the construction it designed is in conformity with that design. Submit one copy of the applicable certification to the Consultant before Substantial Performance.

1.4.8 Record Drawings: Refer to "Record Drawings" and "Record Specifications" articles in this section.

END OF SECTION

PART 1 - GENERAL

1.1 **Shop Drawing General Requirements**

1.1.1 Where specified or where deemed to be required by the Consultant, submit shop drawings to the Consultant in the following manner:

1.1.2 Submit “digital” copies in .pdf file format of each shop drawing with title block appearing at lower right-hand corner.

1.1.3 The use of photographed Consultant’s drawings for shop drawing purposes is not acceptable.

1.1.4 Prior to submission to the Consultant, the Contractor shall review all shop drawings. By this review the Contractor represents that he has determined and verified all field measurements, field construction criteria, materials, catalogue numbers, and similar data, or will do so, and that he has checked and coordinated each shop drawing with the requirements of the work and of the Contract Documents. The Contractor's review of each shop drawing shall be indicated by stamp, date, and signature of a responsible person. The Shop Drawing shall clearly indicate whether it is for review or for record purposes. Any and all shop drawings not bearing the Contractor's stamp (General Contractor and/or Subcontractor) will be returned for resubmission.

1.1.5 The Contractor (and Subcontractor(s) where appropriate), shall mark any information requested by the fabricator, confirm any matters in doubt, check and sign each trade shop drawing, and make any other notations he considers necessary before submitting to the Consultant for review.

1.1.6 Drawings requiring several or extensive changes will be marked "REVISE AND RESUBMIT", otherwise one (1) white print and reproducible will be returned marked "REVIEWED" or "REVIEWED WITH COMMENTS" and shall not be returned to the Consultant. Drawings marked "NOT REVIEWED" have not been reviewed because they are not within the discipline of the Consultant, are not required, or unacceptable.

1.1.7 Manufacturer's catalogue cuts will be acceptable, providing they are 8½" x 11" originals, and they indicate all choices including sizes, colours, model number, options, and other pertinent data. Only one copy need to be submitted to the Consultant, except for colour sample sheets.

1.2 **Shop drawings shall show:**

1.2.1 The name of the project.

1.2.2 Kinds of material and finishes.

1.2.3 Sections, arrangements and details which indicate complete construction, as well as all interconnections with other work.

1.2.4 Fabrication and erection dimensions, together with quantities and/or locations.

1.2.5 Weight of individual items and equipment which will affect the preparatory work of others and subsequent reinforcement required to support loads anticipated.

1.2.6 Assumed design loadings, all dimensions of elements and material specifications for all load-bearing members.

1.2.7 Data verifying that superimposed loads will not affect function, appearance and safety of work shown on shop drawings, as well as other work interconnected.

1.2.8 Proposed chases, sleeves, cuts, and holes in structural members.

1.2.9 The time that the fabricator considers necessary from the date that he receives the Contractor's authority to proceed (and shop drawing is returned) until the fabricated work will be delivered to the site, and for installation, if appropriate.

1.2.10 A 4½" x 3" high block for Consultant’s review stamp, and another block of the same size for review stamp of Contractor's Engineer.

1.2.11 The review by the Consultant is for the sole purpose of ascertaining conformance with the general design concept. The review shall not mean that the Consultant approves the detail design inherent in the shop drawings, responsibility for which shall remain with the Contractor submitting same, and such review shall not relieve the Contractor of his responsibility for errors or omissions in the shop drawings or of his responsibility for meeting all requirements of the Contract Documents. The Contractor is responsible for dimensions to be confirmed and correlated at the job site, for information that pertains solely to fabrication processes or to techniques of construction and installation, and for coordination of the work of all trades.

1.2.12 The review of this drawing and/or any notes added to it, does not constitute authorization to proceed with any work which, in the Contractor's or Supplier's opinion, will involve extra cost to the Owner.

1.2.13 In the event of any conflict between the Contract Documents and a shop drawing, the Contract Documents shall govern.

1.2.14 Keep copies of "reviewed" and "reviewed with comments" shop drawings on site for Consultant’s review.

1.3 **Interference and Coordination Drawings**

1.3.1 The Contractor shall prepare colour-coded interference and coordination drawings in order to properly coordinate the work of all trades, such as, but not restricted to, plumbing and fire protection, sheet metal and air conditioning, electrical and building structure.

1.3.2 Bear all costs involved for the preparation of these drawings and the changes necessitated due to interference discovered by their preparation. Advise all trades and the Consultant of any rerouting or relocation required.

1.3.3 The Contractor shall be responsible for the coordination and quality of work of all it's trades. Obtain one set of all Architectural, Structural, and Electrical Drawings before any trade starts installing it's services. The Contractor shall prepare installation, interference and setting drawings dimensioned and to scale, clear identifying location of the work of each trade and shall submit these drawings for the Consultant's review. The drawings shall make clear all the work intended and show its relation to adjacent piece of work or to the work of other trades. When an alternative piece of equipment is to be substituted for equipment shown, drawings of the area involved shall be prepared by the appropriate trade. Submit five (5) copies of such drawings for review, of which one will be retained by Consultant, two for Owner, and two for General Contractor.

1.3.4 Work shall not proceed in areas involved until after Consultant's final approval of such drawings has been obtained.

1.3.5 If due to the installation of services by one of the sub-trades the services of other sub- trades interfere and require any modification, pay for the cost of any remedial work to it's trades at no additional cost to the Owner.

1.3.6 If interferences are discovered advise Consultant immediately and do not proceed until adjustments are approved.

1.3.7 Submit copies of drawings for the Consultant’s records.

1.3.8 Provide a line item in progress draws for interference drawings.

PART 2 - PRODUCTS

NOT USED

PART 3 - EXECUTION

NOT USED

END OF SECTION

REGULATORY REQUIREMENTS

1 GENERAL

1.01 SUMMARY

.1 This Section references laws, bylaws, ordinances, rules, regulations, codes, orders of Authority Having Jurisdiction (AHJ), and other legally enforceable requirements applicable to the Work and that are or become enforced during performance of the Work.

1.02 DEFINITIONS

.1 Reference Standards: Means consensus standards, trade association standards, guides, and other publications expressly referenced in the Contract Documents.

1.03 REFERENCE STANDARDS AND REFERENCE DOCUMENTS

.1 If specified referenced standards do not indicate an edition or version, the latest edition or revision issued by the publisher at the time of bid closing shall apply, except as follows:

.1 If a particular edition or revision date of a specified standard is referenced in an applicable code or other regulatory requirement, the edition or version in the regulatory reference shall apply.

.2 The specified reference standards establish minimum requirements. If Contract Documents indicate requirements that conflict with a reference standard, the more stringent requirements shall apply.

.3 If multiple reference standards are specified and the standards establish different requirements, the most stringent requirement shall apply.

.4 In case of discrepancy or uncertainties, refer to Consultant for interpretation or clarification.

1.05 CODES

.1 Building Code: Perform Work in accordance with the Ontario Building Code 2012 including amendments up to the time of bid closing and other codes of provincial or local application.

.2 Fire Code: Perform Work in accordance with the National Fire Code of Canada (NFC)2020, and National Fire Code of Canada: 2010 (amended) including amendments up to the time of bid closing and other codes of provincial or local application.

.3 Energy Code: Perform Work in accordance with the National Energy Code of Canada for Buildings (NECB)]2020 and National Energy Code of Canada for Buildings 2015 (amended) including amendments up to the time of bid closing and other codes of provincial or local application.

.4 If there is a conflict or discrepancy between codes, the most stringent requirements shall apply.

.5 Specific design and performance requirements listed in Specifications and indicated on Drawings may exceed minimum requirements established by referenced Codes; these requirements will govern over the minimum requirements listed in the referenced Codes.

2 PRODUCTS

2.01 EASEMENTS AND NOTICES

.1 Owner will obtain permanent easements and rights of servitude that may be required for performance of the Work.

.2 Contractor shall give notices required by regulatory requirements.

2.02 PERMIT REQUIREMENTS

.1 Development Permit: Owner has applied for, obtained, and paid for development permit.

.2 Building Permit:
- .1 Owner has applied for and will be paying for building permit. Contractor is responsible for obtaining or coordinating other permits required for Work and its various parts.
- .2 Contractor shall display building permit and other permits in a conspicuous location at the Place of the Work.

.3 Occupancy Permits:
- .1 Contractor shall apply for, obtain, and pay for occupancy permits, including partial occupancy permits where required by AHJ.
- .2 Contractor shall correct deficiencies in accordance with Consultant's instructions. If a deficiency is not corrected, the Owner reserves the right to make correction and charge Contractor for costs incurred.
- .3 Contractor shall turn occupancy permits over to Owner.

3 EXECUTION

3.01 NOT USED

.1 Not Used.

END OF SECTION

PART 1 - GENERAL

1.1 **Related Requirements**

1.1.1 Section 01 33 00: Submission of samples to confirm product quality.

1.1.2 Section 01 61 00: Material and workmanship quality - reference standards.

1.2 **Independent Testing and Inspection Companies**

1.2.1 Naming of Companies

.1 The Consultant will name independent inspection and testing companies to inspect and report on compliance of Work with the Specifications. For simplicity, independent inspection and testing companies are referred to in the documents as "Inspector(s)".

.2 Inspection and testing by Inspector(s) is carried out for the Consultant's information and does not relieve the Contractor from the responsibility to perform Work in accordance with the Contract Documents.

1.2.2 Work to be Tested and/or Inspected: As listed in Front End / Cash Allowances.

1.2.3 Access to the Work: Representatives of the Inspector(s) shall have access to the Work at all times. The Contractor shall provide assistance and facilities for such access in order that the Inspector(s) may properly perform its function.

1.2.4 Extent of Testing: The extent of testing and inspection and the number of tests, if not specified in the applicable technical section of the Specifications, shall be verified with the Consultant before proceeding. Extra payment for testing and inspection beyond what the Consultant intends will be the Contractor's responsibility.

1.2.5 Notification of Work to be Tested: Be responsible for notifying all Inspector(s) as to when they will be required to inspect the work. Unless specified otherwise notify Inspector(s) at least 48 hours prior to testing.

1.2.6 Materials for Testing and Mock-Ups

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

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

1.2.9 Reports: Inspector(s) will submit copies of inspection and test reports promptly to the Consultant, the Owner, the Contractor, other applicable Consultants, and jurisdictional authorities.

1.3 Contractor's Quality Control

1.3.1 The Contractor shall be responsible for quality assurance, and how it is to be met.

1.3.2 Obtaining and payment of inspections, tests, or Engineer's stamps required by Code or Ordinances, or by a plan approval authority and made by a legally constituted authority, shall also be the responsibility of the Contractor, unless otherwise provided by the Contract Documents.

1.3.3 The Contractor shall be responsible for inspection or testing performed exclusively for his own quality control and convenience, including but not limited to testing, adjustment and balancing of mechanical and electrical systems, and to pay all costs associated therewith.

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

1.4 Review by Consultant

1.4.1 Give the Consultant advance notice of shop fabrication, field erection and other phases of the Work so as to afford them reasonable opportunity to inspect the Work for compliance with contract requirements. Failure to meet this requirement may be cause for the Consultant to classify the Work as defective.

1.4.2 Uncover any Work that has been designated for special tests, inspections or approvals before such is made, have the inspections or tests satisfactorily completed and make good such Work.

1.4.3 The Consultant may order any part of the Work to be examined if such Work is suspected to be not in accordance with the Contract Documents. If, upon examination such Work is found not in accordance with the Contract Documents, correct such Work and pay the cost of examination and correction. If such Work is found in accordance with the Contract Documents, the Owner will pay the cost of examination and replacement.

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

1.5 Mock-Ups

1.5.1 General: Prior to proceeding with the Work, prepare mock-ups as requested in the individual sections of the specifications and in this section. Include for Work of all Sections required to provide mock-ups.

.1 Metal panel [M-1] Screen Wall, Frame [M-2] & Mounting Box

Mockup of frame, expanded metal mesh and mounting box for card readers to demonstrate material connections, assembly. Minimum 610x610 segment to be constructed for review. Contractor to coordinate with architect extent prior to fabrication.

1.6 Test Results and Mixing Designs

1.6.1 Provide test results and mix designs as may be requested.

1.6.2 The cost of tests and mix designs beyond those called for in the Contract Documents or beyond those required by the law of the Place of Work shall be appraised by the Consultant and may be authorized as recoverable.

1.7 Construction Tolerances

1.7.1 Unless more restrictive/demanding requirements are specified in other Sections, the following construction tolerances could be accepted:

.1 "plumb and level" - 3 mm in 3 m.

.2 "square" - 10 seconds more or less than 90 degrees.

.3 "straight" - 3 mm under a 3 m long straight edge.

.4 Tolerances shall not be cumulative.

1.7.2 structure or between the components themselves.

1.8 Non-Compliance With Inspections and Tests

1.8.1 If the initial inspections and tests required to establish compliance with the Contract Documents indicates non-compliance with the Contract Documents, subsequent testing or reinspection occasioned by non-compliance shall be performed by the same Inspector(s) and the cost thereof borne by the Contractor.

1.8.2 Where factual evidence exists that defective workmanship has occurred or that work has been carried out incorporating defective materials, the Consultant may have tests, inspections or surveys performed, analytical calculation of structural

strength made and the like in order to help determine whether the work must be replaced. Tests, inspections or surveys carried out under these circumstances will be made at the Contractor's expense, regardless of their results, which may be such that, in the Consultant's opinion, the work may be acceptable.

1.8.3 All testing shall be conducted in accordance with the requirements of the Ontario Building Code, except where this would in the Consultant's opinion cause undue delay or give results not representative of the rejected material in place. In this case, the tests shall be conducted in accordance with the standards given by the Consultant.

1.8.4 Materials or workmanship which fail to meet specified requirements may be rejected by the Consultant whenever found at any time prior to final acceptance of the work regardless of previous inspection. If rejected, defective materials or work incorporating defective materials or workmanship shall be promptly removed and replaced or repaired to the satisfaction of the Consultant, at no expense to the Owner.

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

1.8.6 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.

1.9 **Testing and Demonstration of Operable Equipment and Systems**

1.9.1 Ensure that the Owner's representatives are adequately instructed in all aspects of operation and maintenance of manual and automated systems and/or equipment, and all tests and adjustments have been performed to ensure smooth, trouble free operation is achieved, in compliance with Contract Documents.

PART 2 - PRODUCTS

NOT USED

PART 3 - EXECUTION

NOT USED

END OF SECTION

PART 1 - GENERAL

1.1 General

1.1.1 Do not substitute materials, equipment or methods different from that shown on Drawings and specified, without written approval of Consultant. Make application for approval of substitution to Consultant.

1.1.2 Use only materials, components and equipment which are in production. If so requested provide a precise model and shop drawings for viewing by Consultant.

1.1.3 Manufacture, pack, ship, deliver and store materials and equipment so that no damage occurs to structural and functional qualities and finished appearances.

1.1.4 Ensure that materials, while transported, stored, or installed, are not exposed to an environment which would increase their moisture content beyond the maximum specified, or in a manner detrimental to their function or appearance, or both.

1.2 Transportation and Handling of Materials

1.2.1 Schedule early deliveries of materials to enable work to be executed without delay. Before delivery, arrange for receiving at site.

1.2.2 Deliver packaged materials and equipment and store until use, with manufacturer's seals and labels intact.

1.2.3 Label packaged goods to describe contents, quantities, and other information as specified.

1.3 Storage and Protection of Materials

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

1.3.2 Store manufactured materials in accordance with manufacturer's instructions.

1.3.3 Store steel, lumber, masonry units, precast concrete work, and similar materials on platforms raised clear of ground.

1.3.4 Store finished materials and woodwork under cover at all times.

1.3.5 All damaged materials will be rejected for use and thereupon shall be immediately removed from site.

1.4 Anchoring Devices, and Accessories

1.4.1 In addition to requirements for fastening devices specified in the technical Sections of the Specifications, include for all fastenings, inserts, caps, closures, anchors, and accessories required for execution of work, and be entirely responsible for their installation.

1.4.2 Unless specified otherwise in the technical sections of the Specifications, use metal fastenings of same material as the metal component they are anchoring, of metal which will not set up electrolytic action which could cause damage to fastenings or components under moist conditions.

1.4.3 If exposed fastenings and accessories are allowed by the Documents in finished areas, use fastenings and accessories of same texture, colour and finish as base metal on which they occur. Keep such exposed fastenings and accessories to a minimum, spaced and laid out evenly and neatly and cut off to make them as inconspicuous as possible, but still provide necessary securement.

1.4.4 Install anchoring devices in such a manner as to provide positive, permanent anchorage of unit to be anchored in position. Space anchors within limits of their capacities. Select all anchoring devices to have a safety factor of 4 against failure for their design load.

1.4.5 Install fastenings of permanent type. Do not install wood plugs.

1.4.6 Fastenings which cause spalling or cracking of material to which anchorage is made are not permitted.

1.4.7 The use of explosive powder tools will not be permitted under any circumstances unless equipped with a device which positively prevents free flight of the stud.

1.5 Manufacturer’s Requirements and Instructions, Workmanship and Qualifications of Workers

1.5.1 Use competent experienced workers, thoroughly skilled in the trade in which they are performing work.

1.5.2 Obtain and follow manufacturer's written instructions, directions and specifications prior to performing the work, and follow them strictly. If instructions are not available, obtain directions from the manufacturer in writing before proceeding. The proceeding of work without this direction is the Contractor's responsibility. It is the Contractor's responsibility to conform to Code requirements in the event that manufacturer's instructions and directions conflict with the Ontario Building Code. Improper installation or erection of products, due to failure in complying with manufacturer's requirements will require removal and re-installation at no cost to Owner.

1.5.3 Be responsible for obtaining up-to-date changes in manufacturer's application procedures.

1.5.4 In the event that products specified have been discontinued advise Consultant.

1.6 **Product Upgrades**

1.6.1 Where upgraded or newer versions or models, of products, components and systems in this Specification, become available during the construction, the Contractor shall provide the Owner with a proposal to change to such upgraded or newer versions or models. Such proposals shall fully identify the effect on Contract Price, schedule, and space requirements.

PART 2 - PRODUCTS

NOT USED

PART 3 - EXECUTION

NOT USED

END OF SECTION

PART 1 - GENERAL

1.1 **Related Requirements Specified Elsewhere**

1.1.1 Section 01 33 23: Shop drawings.

1.1.2 Section 01 29 00: Payment procedures.

1.2 **Substitutions**

1.2.1 During bidding, Consultant will consider written requests from prime bidders for substitutions, received at least 7 working days prior to bid closing date; requests received after that time will not be considered.

1.2.2 All requests for substitution, be it during bidding or at construction stage shall include complete data substantiating compliance with the Contract Documents.

1.2.3 For products:

.1 Product identification, including manufacturer's name and address.

.2 Manufacturer's literature:

.1 Product description

.2 Performance test data

.3 Reference standards.

.3 Samples.

.4 Name and address of similar projects on which product was used, and date of installation.

.5 The Contractor shall make allowance and arrangements at his expense for the Owner if he so desires, to view products installed on other sites.

.6 The Contractor shall submit alternate product information prior to submission of shop drawings of same product.

1.2.4 For construction methods:

.1 Detailed description of proposed method.

.2 Drawings illustrating methods.

1.2.5 Itemized comparison of proposed substitution with product or method specified.

1.2.6 Data relating to changes in construction schedule.

1.2.7 Relation to separate contracts.

1.2.8 **I**n making request for substitution, Contractor represents:

.1 They have generally investigated proposed product or method, and determined that it is equal or superior in all respects to that specified.

.2 They will provide the substitution with the same guarantee as that for product or method specified.

.3 They will coordinate installation of accepted substitution into work, making such changes as may be required for work to be complete in all respects.

.4 Requests for substitutions during construction shall state what cost difference if any, will be made in the Contract Price for each substitution, should it be accepted,

1.2.9 Substitutions will not be considered if:

.1 They are indicated or implied on shop drawings or project data submittals without formal request.

1.2.10 Acceptance will require revision of Contract Documents.

1.3 **Products List**

1.3.1 Within thirty days after date of Contract, submit to Consultant one reproducible transparency of complete list of all products which are proposed for installation.

1.3.2 Tabulate list by each specification section.

1.3.3 For products specified under reference standards, include with listing of each product:

.1 Name and address of manufacturer.

.2 Trade name.

.3 Model or catalogue designation.

.4 Manufacturer's data:

.1 Performance and test data.

.2 Reference standards.

.5 Material safety data sheets.

1.4 **Contractor's Options**

1.4.1 For products specified only by reference standards, select any product meeting standards, by any manufacturer.

1.4.2 In order to establish standards of quality, the Consultant has in the detailed Specifications, referred to certain products by name and catalogue number. Where the drawings have shown specific detailing, dimensions, ratings, characteristics and other performance criteria the details are based on one specific manufacturer and not combinations of more than one.

1.4.3 For products specified by naming several products or manufacturer's, select any product and manufacturer named.

1.4.4 For products specified by naming one or more products, but indicating the phrase "or approved equivalent" after specified product, Contractor must submit request for substitution, for any product not specifically named. The Consultant may at his discretion reject products which in his opinion are not equivalent.

1.4.5 For products specified by naming only one product and manufacturer and without the phrase "or approved equivalent", there is no option, and no substitution will be allowed.

PART 2 - PRODUCTS

NOT USED

PART 3 - EXECUTION

NOT USED

END OF SECTION

ENVIRONMENTAL PROTECTION AND CLEANING

PART 1 - GENERAL

1.1 Dust and Cleaning Requirements

1.1.1 Standards: Maintain project in accordance with the latest edition of The Occupational Health and Safety Act.

1.1.2 Hazard, Debris and Rubbish Control

.1 Provide on-site containers for collection of waste materials, debris and rubbish.

.2 Store volatile wastes in covered metal containers and remove from premises daily.

.3 Prevent accumulation of wastes which create hazardous conditions.

.4 Provide adequate ventilation during use of volatile or noxious substances.

1.1.3 Disposal Operations

.1 Comply with local ordinances and anti-pollution laws:

.2 Do not burn or bury rubbish and waste materials on project site.

.3 Do not dispose of volatile wastes such as mineral spirits, oil, or paint thinner in storm or sanitary drains.

.4 Do not dispose of wastes into streams or waterways.

.5 Remove waste materials, debris and rubbish from site and legally dispose of at public or private dumping areas off Owner's property.

PART 2 - PRODUCTS

2.1 Materials

2.1.1 Use only cleaning materials recommended by manufacturer of surface to be cleaned.

2.1.2 Use cleaning materials only on surfaces recommended by cleaning material manufacturer.

PART 3 - EXECUTION

3.1 General Cleaning

3.1.1 Vacuum-clean interior areas when ready to receive finish painting and continue vacuum cleaning on an as-needed basis until space is ready for Substantial Performance or occupancy.

3.1.2 Obtain from each Subcontractor, instructions which designate proper methods and materials to be use in final cleaning, and submit such instructions to the Consultant. Include instructions in Manufacturer's Data Book specified in Section 01300.

3.1.3 Handle materials in a controlled manner with as few handlings as possible; do not drop or throw materials from heights.

3.1.4 Schedule cleaning operations so that dust and other contaminants resulting from cleaning process will not fall on wet, newly-painted surfaces.

3.2 **Final Cleaning**

3.2.1 At completion of Work, remove waste materials, rubbish, tools, equipment, machinery, and surplus materials, and clean all surfaces exposed to view; leave project clean and ready for occupancy.

3.2.2 Employ experienced workers, or professional cleaners, for final cleaning.

3.2.3 In preparation for Substantial Performance or occupancy, conduct final inspection of interior and exterior surfaces exposed to view, and of concealed spaces.

3.2.4 Remove grease, dust, dirt, stains, labels, fingerprints, and other foreign materials from all sight-exposed interior and exterior finished surfaces; polish resilient and ceramic surfaces so designated to shine finish. Vacuum carpet.

3.2.5 Clean and polish glass.

3.2.6 Repair, patch and touch up marred surfaces to specified finish, to match adjacent surfaces.

3.2.7 Clean filters, exposed ductwork, and structure.

3.2.8 Clean bulbs and lamps and replace those burned out.

3.2.9 Clean diffusers and grilles.

3.2.10 Maintain cleaning until project, or portion thereof, is occupied by Owner.

3.3 **Removal of Temporary Facilities**

3.3.1 Completely remove temporary facilities from site, making good any damage when no longer required.

3.3.2 Maintain cleaning until project, or portion thereof, is occupied by Owner.

END OF SECTION

CLOSEOUT PROCEDURES

PART 1 - GENERAL

1.1 **Final Inspections and Close Out**

1.1.1 Arrange for, conduct and document final inspections, close-out and take-over at Completion of the Contract in accordance with procedures described in OAA/OGCA TAKE-OVER PROCEDURES, Document No. 100.

1.1.2 Forty-five days prior to Substantial Performance, set up a meeting with Subcontractors and Suppliers to go over their various disciplines with the Owner. Prior to Substantial Performance and as scheduled with the Consultant, provide instructional sessions for equipment and for electrical. At this time, one (1) soft copy and two (2) hard copies of the approved brochures and operating manuals and one (1) soft copy of the As-Built Drawings shall be given to the Owner. Instructional period shall be in as many sessions as required to properly disseminate information to Owner's technical staff.

PART 2 - PRODUCTS

NOT USED

PART 3 - EXECUTION

NOT USED

END OF SECTION

PART 1 - GENERAL

1.1 Existing Building Work

1.1.1 Be aware that clauses related to existing facilities are specified in other Sections of the specification, therefore consult all sections of this Specification, together with architectural, structural, mechanical and electrical drawings in their entirety, for work required in, on, or exterior to existing building.

1.1.2 Execute all work in the existing building required by these Specifications and Drawings. This work shall include surface preparation, refinishing and painting of damaged, replaced, and remedial work in the existing building. Work shall be done in accordance with these Specifications for similar work. Visit the existing premises and if available, review existing documents if there is any doubt of existing construction.

1.1.3 Remove all existing components and materials as noted. Relocate components and materials indicated. Protect relocated items until built into new location. Where existing masonry and other materials are removed to widen existing or provide new openings, brace, shore and protect existing structure until lintels have been installed. Where possible, limit removal of such components and materials to smallest area possible. Make good all disturbed or affected areas. Refer to drawings for notes regarding demolition.

1.1.4 Each operation of the work required shall be done by tradesmen specializing in such work, with the overall coordination and the final result being the responsibility of the Contractor.

1.1.5 New surfaces shall finish flush with existing surfaces. Where two existing visible surfaces are to be made one by removal of existing work, these surfaces shall be made flush and similar in material, size, colour, and texture. If this is not possible, a proposal for the Consultant's approval shall be presented. Do not proceed with work without this approval.

1.1.6 Tooth masonry where filling existing openings or where new walls abut existing walls.

1.1.7 Work shall include provision and maintenance of temporary vandalproof, dustproof, and lockable partitions between renovations and existing building where work is being carried out, and adjoining untouched occupied areas of existing building. Weatherproof any openings made in the work with substantial weathertight materials. Insulate as required to maintain thermal integrity of building. Maintain egress and access to and from emergency exits. **THE GENERAL CONTRACTOR SHALL PAY FOR DAMAGES OUTSIDE THE CONSTRUCTION AREA INSIDE OR OUTSIDE THE BUILDING.**

1.1.8 Heritage designated elements of the building are to be protected for the duration of the construction period and are not to be modified, damaged or manipulated. No fastening or demolition of elements at Heritage Designated elements. Any potential requirements identified during construction to modify heritage designated elements to be reviewed prior to proceeding with Owner and Consultant.

1.1.9 Work shall include provision and maintenance of all necessary planking or other required protection to prevent damage to adjacent materials from falling materials, construction traffic, and any other causes during the execution of the Contract.

1.1.10 It is essential that necessary arrangements are made to maintain uninterrupted all services which are necessary for the effective functioning of the existing building program and operations. This includes delivery of new materials, removal, cutting, reconnecting, reinstalling, rerouting, and reinstatement of material and of services complete. Note that noise and disturbance must be kept to a minimum in the existing building. Any work performed within the existing building during normal working hours will be restricted. The Contractor's tender shall include for any necessary overtime to accomplish the work.

1.1.11 Execute all work as quietly as possible in and around existing building during all times that the Owner is occupying it. Noisy operations shall be scheduled with the Owner to achieve the least disturbance. The Owner will determine what level of noise is acceptable in the event of a complaint.

1.1.12 Execute all work in the existing building at a time convenient to the Owner.

1.1.13 Unless otherwise stated, materials recovered due to work in the existing building shall become the property of the Contractor. Salvageable materials may be used in the renovations, where applicable, if approved by the Consultant. Do not use damaged materials, refinish to provide surface satisfactory to Consultant. Remove remaining materials from site.

1.1.14 The existing heating system and all electrical and water services shall remain fully operable. Provide temporary heat as required when existing systems are shut down.

1.1.15 Where existing mechanical and electrical equipment is removed, and new equipment will not be installed, fill holes left in the work with materials to match existing adjacent structures. Provide additional structural supports where holes occur at structural deck.

1.1.16 In all cases, give notice to the Owner at least 48 hours before intending to execute the work in each room and area of existing building, in order that the Owner may remove his furnishings or in the event that a noxious or harmful substance or product is intended to be applied or used, or fumes will result from the use of such a product or substance which may result in nausea or other such bodily injuries.

Provide adequate ventilation to ensure worker safety. Submit WHMIS sheets for Consultant's review.

1.1.17 Remove and replace and make good all ceilings due to work of new equipment and mechanical services. Limit removal to smallest area possible.

1.2 Use of Existing Building

1.2.1 Provide and limit access for construction personnel only to locations at existing building approved by the Owner.

1.2.2 Instruct all construction personnel that only work required under the Contract in the existing building shall be performed, and that no other activities nor use of facilities, washrooms, and services within the building shall be allowed.

1.3 Dimensions

1.3.1 Verify existing dimensions, shown on drawings, to ensure that the location of new materials, equipment and services to be installed are coordinated with existing conditions. Notify the Consultant if existing dimensions differ from the Consultant's drawings. Do not proceed without obtaining the Consultant's directions.

1.4 Regulations Respecting Asbestos

1.4.1 Where work is likely to disturb friable material containing asbestos or work is to be carried on in close proximity to and may disturb friable material containing asbestos the work shall be governed by the Ministry of Labour Ontario Regulations, respecting Asbestos on Construction Projects and in Buildings and Repair Operations - made under the Occupational Health and Safety Act. Where there is a conflict between these regulations and any part of this specification the more stringent requirement shall apply.

1.4.2 If during alteration work existing asbestos material, other than known asbestos-containing material specified in the Designated Substance Survey is discovered do not remove such asbestos-containing material, stop work in that area and immediately notify the Consultant.

1.5 Chasing and Cutting Masonry or Concrete to Accommodate Services

1.5.1 Cut and chase concrete, masonry and other substrates for conduit, receptacles, switches, piping or any other service. Make good after the particular service has been installed. Ensure dust prevention and noise measures are taken. Make arrangements with Owner before cutting. Identify the location of known existing services before cutting. Dispose of debris off site. Cuts proposed through structural

slabs, walls and other members must be approved in writing by the Owner and the Building Structural Engineer. X-ray of slabs is required. All hammer drilling must be done before 8:00 a.m. or after 6:00 p.m. All hole locations shall be submitted in drawings, accompanied by the X-rays for review and approval prior to drilling.

1.6 **Protection of Existing Machinery, Equipment and Surfaces**

1.6.1 Because the existing facility will continue to remain in operation during the Work, it is essential that protection is provided to existing machinery, equipment and surfaces. Protection materials used must be adequate to prevent contamination or damage. Provide extra ordinary temporary measures to control dust and air contamination. Comply with air cleanliness requirements of the Owner.

1.7 **Materials Affecting Occupants**

1.7.1 When it is likely that during installation materials used in the work would affect the health, life safety or well being of building occupants, advise Consultant and Owner so that appropriate measures can be taken. Obtain material safety (WHMIS) data sheets.

1.7.2 Obtain from the Owner's representative permission to cut and/or weld each time such operations will take place. Owner to be given at least 48 hours of notice.

1.7.3 During all welding operations, use smoke eaters at the source of the smoke/fumes. Use exhaust fans and flexible ducts to stop any and all fume/smoke dissipation into the areas not in construction.

1.8 **Openings, Suspensions and Connections**

1.8.1 Cutting of openings into any structural members, floors and walls, not specifically indicated, will be strictly prohibited, unless authorized by the Consultant concerned.

1.8.2 The Contractor shall be responsible for examining and testing all existing conditions, structure, etc., to or from which new work or material is connected, suspended, or supported, by his own forces or by any Subcontractor or tradesman, and he shall immediately report to the Consultant or the Consulting Engineer any condition or situation which might prove unsound or unsuitable to receive the new work, before proceeding with it.

1.9 **Fire Safety**

1.9.1 Work shall include provision and maintenance of fire protection and proper and safe means of fire exit from all zones of the existing building at all times, to the approval of the Jurisdictional Authorities.

1.9.2 Make allowance for and include all requirements necessary to provide for the safety of occupants in the existing building through the elimination and control of fire

hazards, the maintenance of existing life safety systems, fire walls, doors, dampers, fire suppression systems and fire safety plans.

1.9.3 Where existing fire separations, doors or other closures, walls, ceilings and floors are damaged or breached in such a manner so as to affect the integrity of their fire resistance rating, such damage shall be repaired immediately and expeditiously so that the integrity of the fire separations is maintained.

1.9.4 Maintain doors and closures in fire separations so that they are operable at all times.

1.9.5 Do not block or wedge fire doors open.

1.9.6 Keep fusible links and heat and smoke devices operable and free of paint or dirt.

1.9.7 Inspect door hardware and other ancillary components and make necessary adjustments or repairs to ensure proper closing and latching.

1.9.8 Repair or replace inoperative parts of hold-open devices and automatic releasing devices.

1.9.9 Check fire doors as frequently as necessary to ensure they remain closed.

1.9.10 Inspect and maintain fire dampers and firestopping.

1.9.11 Remove debris from means of egress on a daily basis, and if it impedes exiting remove it immediately.

1.9.12 Combustible materials shall not be permitted to accumulate in any part of an elevator shaft, stairway, or other means of egress.

1.9.13 Fire access routes and access panels or windows provided to facilitate access for fire fighting operations shall not be obstructed by vehicles, gates, fences, building materials, vegetation, signs, or other form of obstruction.

1.9.14 Clearly identify and maintain fire department sprinkler and standpipe connections for use at all times.

1.9.15 Maintain fire access routes so as to be immediately ready for use at all times by fire department vehicles.

1.9.16 Hoods, filters and ducts that are subject to accumulations of combustible deposits shall be checked weekly and be cleaned when the deposits become a fire hazard.

1.9.17 Disconnect switches for mechanical (air-conditioning) and ventilation systems shall be capable of being shut down. Work on ducts involving the use of heat producing devices for cutting, welding or soldering shall not be undertaken before the system has been shut down, the duct cleaned of any accumulations of combustible

deposits and any combustible lining and covering material that could be ignited by such work has been removed.

1.9.18 Precautions shall be taken, where necessary, to ensure that there is no damage to fuel supply piping or equipment that would result in fuel leakage or a fire hazard during renovations or excavations.

1.9.19 Ensure sprinkler heads are not obstructed, and sprinkler systems remain operational at all times.

1.9.20 Ensure fire hose cabinets are not obstructed and contents remain in place and are readily available for use.

1.9.21 Storage of compressed gas or liquid cylinders shall be in accordance with Section 5.6 of The Ontario Fire Code.

1.9.22 Ensure lighting for illumination in exits, and access to exits is maintained.

1.9.23 Required exit signs shall be clearly visible and maintained in a clean and legible condition.

1.9.24 Internally illuminated exit lights shall be kept clearly illuminated at all times, when the building is occupied.

1.9.25 Pilot lights on emergency lighting unit equipment shall be checked monthly for operation.

1.9.26 Emergency lighting unit equipment shall be inspected monthly to ensure that:

.1 The terminal connections are clean, free of corrosion and lubricated when necessary.

.2 The terminal clamps are clean and tight as per manufacturer's specifications.

.3 The electrolyte level and specific gravity are maintained as per manufacturer's specifications, and

.4 The battery surface is kept clean and dry.

1.9.27 Emergency lighting unit equipment shall be tested monthly to ensure that the emergency lights will function upon failure of the primary power supply.

1.10 **Temporary Fire Protection Devices**

1.10.1 Operable fire extinguishers must be kept on the premises throughout the construction period and these extinguishers must be sufficient in number and of suitable type to combat a potential fire in the work area. Any contractors working

with an open flame must provide for their own fire extinguishers in an operable condition. Existing extinguishers are not to be removed from cabinets.

1.10.2 The following equipment shall be considered as a minimum. Provide additional equipment as required.

.1 One (1) fire extinguisher at each work area on site.

.2 Provide and maintain temporary fire protection during construction as required by Fire Insurance Company regulations and municipal fire prevention authorities.

.3 Maintain fire hydrants in operating order in existing building areas (if applicable).

.4 Extinguishers, generally, shall be 2-1/2 gallon capacity of soda acid type. Where subject to lower temperatures, they shall be antifreeze type.

.5 In proximity to gas, oil, grease, or paint storage locations extinguishers shall be 10# CO-2.

.6 Keep extinguishers fully charged.

1.11 **Use of Existing Elevator**

1.11.1 The use of existing elevator is subject to approval by Owner. Any requests shall conform to Owner's schedule for building use. If allowed, protect all surfaces from damage.

PART 2 - PRODUCTS

NOT USED

PART 3 - EXECUTION

NOT USED

END OF SECTION

DEMOLITION AND PREPARTATION FOR NEW WORK

PART 1 - GENERAL

1.1 **General Requirements**

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

1.2 **Related sections**

1.2.1 Section 01 77 00 Existing Building Work

1.3 **Work Included in Section**

1.3.1 Various demolition and removals shown/noted on Drawings.

1.3.2 Restoration of damaged or disturbed work.

1.3.3 Removal of surplus materials from the site.

1.4 **Referenced Standards**

1.4.1 CSA S350-M1980 (R2003) Code of Practice for Safety in Demolition of Structures.

1.5 **Existing Conditions**

1.5.1 Take over structures to be demolished based on their condition (on date that tender is accepted) at time of examination prior to tendering).

1.6 **Demolition Drawings**

1.6.1 Where required by authorities having jurisdiction, submit for approval, drawings, diagrams or details showing sequence of disassembly work and supporting structures and underpinning.

1.6.2 Submissions to bear stamp of qualified professional engineer registered in the Province of Ontario.

1.7 **Quality Assurance**

1.7.1 Comply with all applicable municipal regulations, the Occupational Health and Safety Act 1991 and Regulations for Construction Projects and the Ontario Building Code.

1.7.2 Complete all measures required by the authority having jurisdiction for the enclosure of the site and protection of the public before the work of demolition is commenced.

1.7.3 Conspicuously post danger signs around the property. Close off with barricades all doorways and thoroughfares giving access to the area of demolition.

1.7.4 Requirements specified herein shall be considered the minimum requirements; be responsible for providing and performing things required and necessary to complete the work, in a safe, proper and workmanlike manner.

1.7.5 A competent foreman shall be in charge of the work at all times while work is in progress.

1.8 **Maintaining Traffic**

1.8.1 Maintain and preserve Owner's access requirements to and from existing buildings(s) in areas where demolition and removal work is being carried out (and throughout the existing building).

1.8.2 Do not close, obstruct, place or store material in Owner's driveways and passageways. Conduct operations with minimum interference with roads, streets, driveways and passageways.

1.9 **Hauling Operations**

1.9.1 Haul and move machines, vehicles and equipment over designated route and within work areas as designated by Consultant.

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

1.10 **Interruptions To Owner's Operations**

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

1.11 **Protection**

1.11.1 Protect work to remain against damage of any kind. Repair or replace damaged work at the discretion of Consultant, at no cost to Owner.

1.11.2 Protect existing building floor and roof against damage from operations under this Section, including lifting, moving, rolling, etc., of materials. Use [13 mm|1/2"] thick plywood covers with ends mechanically joined, over floor for any such handling. Be responsible for repairs to flooring for any damage caused. Execute such repairs to the satisfaction of, and at no cost to Owner.

1.11.3 Prevent debris from blocking surface drainage system, elevators, mechanical and electrical systems which must remain in operation.

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

1.11.5 Provide and maintain necessary fire extinguishers throughout the work at all times to the approval of the Fire Marshal, and located at convenient and accessible points.

1.11.6 Maintain Services Required For Building Operation.

1.11.7 Many of the service lines which are being modified, particularly those on the existing exterior walls, must be kept in service throughout the construction period except for brief change-over periods.

1.11.8 Do work required to maintain such services, including preparation of sketches, detail scheduling of such work and coordinating and obtaining approval of Consultant.

PART 2 - PRODUCTS

2.1 Materials

2.1.1 Temporary Wood Studs: Construction Grade Spruce.

2.1.2 Polyethylene Sheet: [0.152 mm | 6 mil.], thick, clear, stapled in place.

2.1.3 Plywood: Douglas Fir plywood.

PART 3 - EXECUTION

3.1 Temporary Screens (Hoarding)

3.1.1 Dustproof Screens: Before any work proceeds in any particular area in the existing building, temporarily enclose the area and access thereto, with clean polyethylene sheet material, (clean polyethylene sheet screen) overlapped [100 mm | 4"] and taped at floor, ceiling (and doors), walls or intersecting members, in a manner to prevent dust and dirt infiltration into the adjoining areas to the satisfaction of Consultant. Take every possible precaution to prevent dust and dirt resulting from

the contract operations from entering Owner's operational areas. Adjust and relocate such screens as required for the various operations under the contract. Refer to architectural demolition drawings.

3.1.2 Preparation

.1 Disconnect and re-route electrical and telephone service lines entering buildings to be demolished in accordance with authorities having jurisdiction. Post warning signs on electrical lines and equipment which must remain energized to serve other properties during period of demolition.

3.1.3 Demolition

.1 At end of each day's work, leave work in safe condition so that no part is in danger of toppling or falling. (Protect interiors of parts not to be demolished from exterior elements at all times).

.2 Demolish to minimize dusting. Keep materials wetted as directed by Consultant.

.3 Do not sell or burn materials on site.

.4 Remove contaminated or dangerous materials as defined by authorities having jurisdiction, relating to environmental protection, from site and dispose of in safe manner to minimize danger at site or during disposal.

3.2 Demolition and Removals

3.2.1 Carry out demolition work, removal of existing materials and equipment, and disposal of resultant debris not specifically called for under various Sections of the Specification but which is required to complete the work of this Section. Proceed with demolition of, or alteration to, any portion of existing building ONLY after thorough protection of existing building has been achieved, as directed and/or accepted by Consultant.

3.2.2 Confine operations and workmen to those parts of the building which are defined on Drawings, and exercise great care not to damage existing construction beyond that necessary for the carrying out new work and make good any such damage in every respect.

3.3 **Materials To Be Reused**

3.3.1 Where indicated on Drawings to be removed and stored for future use by Owner, or for later reuse by other trades of this Contract, remove, handle and transport such items to storage area designated on Drawings or to an area within the site designated by Consultant. Perform such work carefully and with diligence to prevent any damage to the items during removal and in storage.

3.4 **Cutting**

3.4.1 Perform required cutting using power operated cutting devices. Chipping will not be allowed. Breaking out shall commence only after sawcutting of the cut-off points has been performed in order to prevent damage to remainder.

3.4.2 Demolish masonry and concrete in small sections.

3.4.3 Coordinate with mechanical trade and sawcut and breakout existing floor or wall to accommodate new mechanical piping or conduit. Have mechanical trade lay out and supervise work.

3.4.4 Sawcut existing roofing and deck for new openings to dimensions shown on Drawings and provide temporary weatherproof enclosures properly held in place. Existing gravel surfacing, roofing felts, insulation and vapour barrier shall be reasonably cut back as required for new openings.

3.5 **Disposal of Materials, Rubble and Debris**

3.5.1 Surplus Materials

.1 Materials forming permanent part of the building that require removal become Contractor's property and must be removed from site daily, unless such materials are otherwise specified or shown on Drawings to be reused under this Contract (or turned over to Consultant). Remove materials not suitable for reuse as shown on Drawings (as specified) from site.

.2 Stockpiling of surplus materials on site will not be permitted.

3.5.2 Rubble and Debris

.1 Rubbish and debris resulting from execution of the work shall be cleaned up as they are generated. Dispose of same at end each day's work or place in waste disposal bins which must be emptied on a regular basis. Stockpiling of rubble and debris will not be permitted.

.2 Do not burn material on site.

3.6 **Cleaning-Up**

3.6.1 Leave building in a "broom-clean" condition on completion of work to Consultant's satisfaction.

3.6.2 Clean all existing surfaces specified to receive new applied finishes to assure proper adherence.

3.6.3 Clean all existing surfaces to receive paint finish to paint manufacturer's written specifications and/or recommendations.

3.7 **Designated Substance Survey**

3.7.1 A designated substance survey was conducted by the Owner to determine the presence of environmentally hazardous materials. A copy of this report is available for review.

3.7.2 No responsibility is assumed by the Consultant for the scope or accuracy of this report. The Trade Contractor shall review the report and the existing facilities and extract his own conclusions and interpretation.

END OF SECTION

METAL FARBICATIONS

PART 1 - GENERAL

1.1 General Requirements

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

1.2 Referenced Standards

1.2.1	ASTM A143-01	Standard Practice for Safeguarding Against Embrittlement of Hot-Dip Galvanized Structural Steel Products and Procedure for Detecting Embrittlement
1.2.2	ASTM A167-99 (2004)	Standard Specification for Stainless and Heat Resisting Chromium-Nickel Steel Plate, Sheet and Strip
1.2.3	ASTM A307-00	Standard Specification for Carbon Steel Bolts and Studs, 60,000 psi Tensile Strength
1.2.4	ASTM A325M-03	Standard Specification for High Strength Bolts for Structural Steel Joints (Metric)
1.2.5	ASTM A380-99 (2005)	Standard Practice for Cleaning, Descaling, and Passivation of Stainless Steel Parts, Equipment, and Systems
1.2.6	ASTM A563M-04	Standard Specification for Carbon and Alloy Steel Nuts (Metric)
1.2.7	ASTM A780-01	Standard Practice for Repair of Damaged and Uncoated Areas of Hot-Dip Galvanized Coatings
1.2.8	CAN/CSA-S16.1-01	Limit States Design of Steel Structures
1.2.9	CSA W47.1-03	Certification of Companies for Fusion Welding of Steel Structures
1.2.10	CSA W55.3-1965 (R1998)	Resistance Welding Qualification Code for Fabricators of Structural Members Used In Buildings
1.2.11	CSA W59-03	Welded Steel Construction (Metal Arc Welding)
1.2.12	CSA-G40.20-04/G40.21-04	General Requirements for Rolled or Welded Structural Quality Steel/ Structural Quality Steel

1.2.13	CSA-G164-M92 (R1998)	Hot Dip Galvanizing of Irregularly Shaped Articles
1.2.14	ANSI/NAAMM	MBG 531-88 Metal Bar Grating

1.3 **Quality Assurance**

1.3.1 Qualifications of metal fabricator / subcontractor in custom metal fabrication: Execute work of this Section using a firm thoroughly conversant with governing laws, bylaws, and regulations. Use workmen skilled in work of this Section. The metal fabricator / subcontractor for the metal panels and supporting metal assembly must have a minimum of 10 years experience with custom metal fabrication.

1.3.2 Welding

.1 Welding of structural components shall be done only by fabricators certified by CSA Welding Qualification Codes, CSA W47 or W55.3 as applicable, for welding of steel and who shall perform welding to meet specified requirements of W59.1, as may apply.

.2 Weld all stainless steel by the Argon Arc process. Grind smooth and polish joints, crevice free, and flush without seams.

.3 Weld all connections where possible, and bolt where not possible. Provide method to prevent loosening of nuts. Ream holes drilled for fastenings. Make welded joints tight, flush, and in true planes with base metals. Make welds continuous at joints where entry of water into building or into voids of members or assemblies is possible. Grind welds in exposed locations smooth in a manner that will not leave blemishes on exposed surfaces. Join members generally by inert metal arc welding where practicable, using materials recommended by manufacturers of metals being welded. Remove flux completely following welding, and grind and polish joints smooth and clean.

.4 Where galvanized steel is to be welded, provide adequate ventilation. If adequate ventilation is not available provide supplementary air circulation. In confined spaces use a respirator.

.5 Touch up all uncoated weld areas.

1.4 **Shop Drawings**

1.4.1 Submit shop drawings in accordance with Section 01 33 23, of all the work of this Section, including large-scale detail of members and materials, of connection and jointing details, and of anchorage devices, dimensions, gauges, thicknesses, description of materials, metal finishing, as well as all other pertinent data and information, for Consultant's review before fabrication.

1.4.2 Submit shop drawings for the following metal components:

.1 Metal panel screen wall shop drawings:

1. Indicate all metal panels along Edward Street within bay openings. Coordinate with structural.

2. Details of connections of metal panels to supporting assembly.

3. Details of metal panels and doors coordinated with hollow metal doors & hollow metal frames.

4. Refer to architectural & structural drawings, including

.2 High-speed garage door support structure

1. Refer to Structural Drawings

1.5 **Samples**

1.5.1 Metal panel screen wall samples:

1. Provide a minimum two (2) 300mm x 300mm (12” x 12”) samples of [M-1] expanded metal mesh panel together with:

2. Provide a minimum 2 (2) 300mm x 300mm (12” x 12”) corner sample of metal frame surround [M-2] for [M-1] panels.

1.6 **Product Delivery, Storage, and Protection**

1.6.1 Maintain protection provided for work of this Section from time of installation until final finishes are applied or to final cleanup.

1.6.2 Protect prime-painted and galvanized surfaces from damage.

1.6.3 Protect exposed surfaces of prefinished metal work which does not receive site finishing with protective coatings or wrappings. Use materials recommended by finishers or manufacturers of metals, to ensure that method is sufficiently protective, easily removable, and harmless to the finish.

1.6.4 Load and store galvanized articles as follows to prevent the formation of wet storage stain:

.1 Stack the articles or bundle to allow air between the galvanized surfaces during transport from the supplier. Load the material in such a manner that continuous drainage could occur.

.2 Raise the articles from the ground and separate with strip spacers to provide free access of air to most parts of the surface. Incline in a manner which will give continuous drainage. Under no circumstances will galvanized steel be allowed to rest on cinders, clinkers, wet soil or decaying vegetation.

.3 Handle galvanized articles in such a manner as to avoid any mechanical damage and to minimize distortion.

PART 2 - PRODUCTS

2.1 **Materials**

2.1.1 General: Metals shall be free from defects which impair strength or durability, or which are visible. Metals shall be new, of best quality, and free from rust, or waves, or buckles, clean, straight, and with sharply defined profiles.

2.1.2 Metals

.1 Steel: For structural sections hot rolled to meet requirements of CAN3-G40.21, Grade 50W for tubes and Grade 44W for flat shapes. For sheet cold-rolled furniture steel, double annealed, mill stretched and levelled, and fully pickled. Otherwise, steel shall be hot-rolled or cold-rolled of alloy to suit needs of fabrication, use, and appearance.

.2 Stainless Steel: Type 304 alloy conforming to ASTM A167, No. 4 finish.

.3 Primers and Coatings

.1 Interior Steel in Dry Areas: Quick drying oil alkyd conforming to CISC/CPMA 2.75.

.4 Exterior Steel, Interior Steel in Unheated Areas, Steel Embedded in Concrete: Hot dip galvanized conforming to CSA G164.

.5 Cold Galvanizing Coating Touch-Up: W.R. Meadows "Galvafroid" or Kerry Industries "Z.R.C." zinc rich coating or similar manufacturer containing minimum 90% zinc by weight.

.6 Fastenings: Use nuts and bolts conforming to ASTM A307, A325, and A563 as applicable.

.7 For interior work, use cadmium-plated fastenings where other protection is not specified.

.8 For exterior work and interior wet areas such as but not limited to shower rooms, change rooms use 300 series stainless steel.

2.1.3 Anchors and Shims For exposed anchorage of stainless steel, use stainless steel and otherwise to match metal anchored. For non-exposed work, anchors and shims may be galvanized steel.

2.1.4 Anchors and Shims Pipe: To ASTM A53, extra strong steel pipe for bollards.

2.1.5 Expanded Metal Mesh panel [M-1] assembly:

.1 Metal panels and supporting assembly to be provided by one metal fabricator / subcontractor, with experience in custom metal fabrication. See Quality Assurance item 1.3.

.2 All metal panels [M-1] and supporting assembly components are to be powder coated finish. Powder coat finish to match finish on overhead coiling doors (refer to 08 33 23.13).

.3 All Metal angles framing expanded metal panels to be painted to match [M-1] Panels. (refer to 09 91 00)

.4 The metal panel screen walls along Edward St and Elizabeth St are composed of but not limited to the following components:

.5 Expanded Metal panels:

.1 [M-1] Apex 03 by Amico Global

Visual % Open: 26%

Long way Diamond: 6.0”

Short Way Diamond: 2.5”

Finish: Powder Coat

2.1.6 High speed garage door metal support:

.1 All metal supporting assembly components are to be painted finish.

.2 Refer to Architectural drawing and Structural drawings & specifications.

2.1.7 Angle support for hollow metal door frames and expanded metal mesh

.1 Angles required for the support and anchorage of hollow metal and aluminium door frames to masonry openings are the responsibility of the miscellaneous metals section.

.2 Hot dip galvanize exterior angles, and prime paint.

.3 Painted to match [M-1] panels

2.1.8 Lintels and Shelf Angles

.1 Lintels or shelf angles secured to a structural steel member are the responsibility of structural steel trade.

.2 Other lintels and shelf angles are the responsibility of the miscellaneous metals section.

.3 Hot dip galvanize exterior lintels and shelf angles, and prime paint.

.4 Refer to Structural Drawing for lintel schedule. Hot dip galvanize shelf angles and bracing for support of masonry. Provide 6 mm expansion gaps at corners and between lengths of shelf angles. Bolt angles to allow for construction inaccuracies and tolerances unless shown as welded. At corners, bolts should not exceed 250 mm from corner. Maximum thickness of shims shall not exceed 9 mm.

2.2 **Design and Fabrication**

2.2.1 Generally

.1 Fabricate work of this Section with machinery and tools specifically designed for the intended manufacturing processes, and with skilled tradesmen.

.2 Fit and assemble work in the shop. When this is not possible, make a trial shop assembly.

2.2.2 Construction

.1 Fabricate work with materials, component sizes, metal gauges, reinforcing, anchors, and fasteners of adequate strength to withstand intended use, and with allowable design factors imposed by Jurisdictional Authorities.

.2 Ensure that work will remain free of warping, buckling, opening of joints and seams, distortion, and permanent deformation.

2.2.3 Assembly

.1 Accurately cut, machine, and fit joints, corners, copes and mitres so that junctions between components fit together tightly, and in true planes.

.2 Fasten work with concealed methods, unless otherwise indicated on the Drawings.

.3 Weld all connections where possible, and bolt where not possible, and cut off bolts flush with nuts. Countersink bolt heads and provide method to prevent loosening of nuts. Ream holes drilled for fastenings.

.4 Make welded joints tight, flush, and in true planes with base metals, and continuous at joints where entry of water into building or into voids of members or assemblies is possible. Continuously grind and make smooth welds in exposed locations.

.5 Provide for differential movements within assemblies and at junctions of assemblies with surrounding work.

.6 Plug galvanizing vent holes with pear shaped fishing weights hammered in place and filed smooth.

.7 Fabricate shims of galvanized steel of sizes required.

2.2.4 Finish Work

.1 Provide holes and connections for work installed under other Sections of this Specification.

.2 Cleanly and smoothly finish exposed edges of materials, including holes.

.3 Cap open ends of sections exposed to view, such as pipes, channels, angles, and other similar work.

2.2.5 Prime Painting of Steel: Clean all loose mill scale, rust, dirt, weld flux, and spatter from work after fabrication. Grind smooth sharp projections. Prepare for prime

painting by blast cleaning to SSPC-SP6. Apply to steel a shop prime coat of paint. Work paint into corners, and onto open areas smoothly. Deliver work to site with primer undamaged. Paint all surfaces except those to be welded in field, encased in concrete, or that are machined or galvanized. Paint surfaces that are inaccessible to finish field painting with two coats of primer.

2.2.6 Galvanized Steel

.1 Pre-clean steel work in accordance with accepted methods to produce an acceptable surface for quality hot dip galvanizing.

.2 Galvanize steel members, fabrications, and assemblies after fabrication by the hot dip process in accordance with CSA G164. Minimum coating Z275.

.3 Galvanize bolts, nuts and washers and iron and steel hardware components in accordance with CSA G164.

.4 Safeguard products against steel embrittlement in conformance with ASTM A143.

.5 Design features which may lead to difficulties during galvanizing shall be pointed out prior to dipping.

.6 The composition of metal in the galvanizing bath shall be not less than 98.0% zinc.

.7 Galvanized surfaces to be painted must be prepared to insure adhesion. Brush blasting, hand tooling or acid etching before application of coating. Oxidation of galvanized surfaces must be removed prior to coating.

Surface treatment with Clean ‘n Etch by Great Lakes Laboratories or similar. Apply treatment as per manufacturer’s recommendations.

2.2.7 Mechanical Damage: Repair areas damaged by welding, flame cutting, or during handling, transport or erection (in accordance with ASTM A780) using one of the following methods whenever the damage exceeds 4.7 mm in width:

.1 Cold Galvanizing Compound

.2 Ensure surfaces to be reconditioned with cold galvanized zinc-rich compound are clean, dry, and free of oil, grease and corrosion products.

.3 Power clean areas to be repaired to near white metal condition. To ensure that a smooth reconditioned coating can be effected, extend surface preparation into the undamaged galvanized compound.

.4 Touch up using specified cold galvanizing compound.

.5 Spray or brush apply paint in minimum two coats until a dry film thickness of 4 mils minimum has been achieved. Apply a finish coat of aluminum paint to provide a colour blend with the surrounding galvanizing. Verify coating thickness by measurements with a magnetic or electromagnetic gauge.

.6 Treat galvanized surfaces that are cut, welded, or threaded with three coats of cold galvanizing compound immediately following damage to galvanized protection.

.7 Coating shall be continuous, adherent, as smooth and evenly distributed as possible and free from any defect that is detrimental to the stated end use of the coated article.

.8 Determine the integrity of the coating by visual inspection and coating thickness measurements.

.9 The galvanized coating shall be sufficiently adherent to withstand normal handling during transport and erection.

2.2.8 Wet Storage Stain: Remove any wet storage stain if formed and discovered prior to leaving the galvanizer's plant, unless late pick up or acceptance of delivery has necessitated the material being stored in unfavourable conditions. In any event, remove wet storage stain before installation so that premature failure of the coating will not occur. Remove wet storage stain as follows:

.1 Arrange the objects so that their surfaces dry rapidly.

.2 Remove light deposits by means of a stiff bristle (not wire) brush. Remove heavier deposits by brushing with a 5% solution of sodium or potassium dichromate with the addition of 0.1% by volume of concentrated sulphuric acid. Apply with a stiff bristle brush and leave for about 30 seconds before thoroughly rinsing and drying. Alternatively a proprietary product such as Oakite Highlite, which is intended for this purpose may be used according to manufacturer's recommendations.

2.2.9 Stainless Steel Work

.1 The stainless steel fabricator shall take all necessary precautions to safeguard against latent surface discolouration due to disturbance of the natural protective oxide coating of the material or to contamination from other sources. The fabrication process shall include proper and adequate cleaning in accordance with the recommended practices set out in ASTM A380.

.2 Workmanship shall be the best standard practice for this type of work. Do all stainless steel work in accordance with NAAMM, Code of Standard Practice for the Metal Industry, Workmanship, Class 1.

.3 Do all stainless steel fabrication in clean shops, located away from areas where carbon steel is burnt, ground, or cut with abrasive wheels to ensure that carbon steel dust will not be embedded into the stainless steel.

.4 Prior to fabrication of stainless steel clean tools and dies which have been used on carbon steels.

.5 Ensure tools and dies used for forming and cutting stainless steel are free of nicks and other damage.

PART 3 - EXECUTION

3.1 Inspection of Site

3.1.1 Take site measurements to ensure that work is fabricated to fit surrounding construction around obstructions and projections in place, or yet to be put in place to suit service locations, and inaccuracies of construction.

3.2 Installation

3.2.1 Install work plumb, true, square, straight, level, and accurately and tightly fitted together and to surrounding work.

3.2.2 Work includes anchor bolts, bolts, washers and nuts, lag screws, expansion shields, toggles, straps, sleeves, brackets, clips, shims and other items necessary for secure installation, as required to support and/or resist loads and forces, and as required by Jurisdictional Authorities.

3.2.3 Provide anchors at 600 mm o.c. for cast-in-place work unless shown otherwise.

3.2.4 Attach work to wood by screws through countersunk holes in metal.

3.2.5 Attach work to masonry with lead plugs and non-corrosion fastenings to support load with a safety factor of 3.

3.2.6 Insulate between dissimilar metals, or between metals and masonry or concrete with bituminous paint to prevent electrolysis.

3.2.7 Caulk between components installed under this work.

3.3 Patching and Refinishing

3.3.1 After erection, touch up prime paint and galvanized finishes damaged or removed during installation.

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

3.3.3 Refinish shop-applied finishes in field only with approval of Consultant.

3.3.4 Clean off dirt on surfaces resulting from installation work.

END OF SECTION

HOLLOW METAL DOORS AND FRAMES

1 GENERAL

1.01 RELATED REQUIREMENTS

.1 Section 05 50 00 – Metal Fabrications

.3 Section 08 71 00 - Door Hardware

.6 Section 09 91 00 - Painting

1.02 REFERENCE STANDARDS

.1 American National Standards Institute/Steel Door Institute (ANSI/SDI):
- .1 ANSI/SDI A250.7-[1997], Nomenclature for Standard Steel Doors and Steel Frames
- .2 ANSI/SDI A250.11-[12], Recommended Erection Instructions for Steel Frames

.2 ASTM International (ASTM):
- .1 ASTM A 653/A 653M-[18], Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process
- .2 ASTM A 780/A 780M-[20], Standard Practice for Repair of Damaged and Uncoated Areas of Hot-Dip Galvanized Coatings
- .3 ASTM A 879/A 879M-[12], Standard Specification for Steel Sheet, Zinc Coated by the Electrolytic Process for Applications Requiring Designation of the Coating Mass on Each Surface
- .4 ASTM A 924/A 924M-[20], Standard Specification for General Requirements for Steel Sheet, Metallic-Coated by the Hot-Dip Process
- .5 ASTM D 4726-[18], Standard Specification for Rigid Poly(Vinyl Chloride) (PVC) Exterior-Profile Extrusions Used for Assembled Windows and Doors

.3 Canadian General Standards Board (CGSB):
- .1 CAN/CGSB-1.132-M90, Zinc Chromate Primer, Low Moisture Sensitivity
- .2 CAN/CGSB-1.181-99, Ready-Mixed Organic Zinc-Rich Coating
- .3 CGSB 41-GP-19Ma-84, Rigid Vinyl Extrusions for Windows and Doors
- .4 CAN/CGSB 82.5-M88, Insulated Steel Doors

.4 CSA Group (CSA):
- .1 **CSA G40.20-[13] /G40.21-[13]**, General Requirements for Rolled or Welded Structural Quality Steel/Structural Quality Steel
- .2 CSA W59-[18], Welded Steel Construction, Includes Errata (2020)

.5 Canadian Steel Door Manufacturers Association (CSDMA):
- .1 Recommended Dimensional Standards for Commercial Steel Doors and Frames, [2000]
- .2 Recommended Specifications for Commercial Steel Doors and Frames, [2006]

.3 Recommended Selection and Usage Guide for Commercial Steel Door and Frame Products, [2009]
.4 Storage and Installation Guide, [2012]

.6 Fenestration & Glazing Industry Alliance (FGIA) (formerly American Architectural Manufacturers Association (AAMA)):
.1 AAMA 812-[19], Voluntary Practice for Assessment of Frame Deflection When Using One Component Polyurethane Foams for Air-Sealing Rough Openings of Fenestration Installations

.7 National Fire Protection Association (NFPA):
.1 NFPA 80-[2013], Standard for Fire Doors and Other Opening Protectives
.2 NFPA 252-[2022], Standard Methods of Fire Tests of Door Assemblies

.8 Steel Door Institute (SDI):
.1 SDI-108-[18], Recommended Selection and Usage Guide for Standard Steel Doors
.2 SDI-111-[09], Recommended Details for Standard Steel Doors, Frames, Accessories and Related Components
.3 SDI-122-[15], Installation Troubleshooting Guide for Standard Steel Doors and Frames

1.03 ADMINISTRATIVE REQUIREMENTS

.1 Coordination:
.1 Coordinate primers for doors and frames with site-applied paint as indicated in Section 09 91 00 - Painting.
.2 Coordinate throat dimensions based on actual material used for support / wall and partition construction assemblies.

1.04 ACTION AND INFORMATIONAL SUBMITTALS

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

.2 Product Data:
.1 Submit manufacturer's product data for each type of door and frame. Indicate door designation, type and model, product characteristics, core description, fabrication details, dimensions, fire-protection rating, finishes, and limitations.
.2 Submit WHMIS Safety Data Sheet (SDS).

.3 Shop Drawings:
.1 For each type of door, indicate material, steel core thicknesses, mortises, reinforcements, location of exposed fasteners, openings, arrangement of hardware, fire-protection rating, and finishes.
.2 For each type of frame, indicate material, core metal thickness, reinforcements, location of anchors and exposed fastenings, reinforcing, fire-protection rating, and finishes.
.3 Include a schedule identifying each unit with door marks and numbers matching numbering on Drawings and door schedule.

.4 Certificates:
.1 Where fire-protection rated door and frame exceeds size limitations of fire labelled assemblies, submit evidence indicating compliance with fire labelling for door and frame assembly.

1.05 CLOSEOUT SUBMITTALS

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

.2 Warranty Documentation: Submit manufacturer's material and fabrication warranty.

1.06 QUALITY ASSURANCE

.1 Qualifications:
.1 Manufacturer: A member in good standing of the Canadian Steel Door Manufacturers Association.
.2 Installers: Experienced with installation of hollow metal doors and frames of similar complexity and scope to that required for the Project.
.3 Testing Agencies: Provide doors and frames under label service program of a testing agency acceptable to authorities having jurisdiction (AHJ).

.2 Manufacturer: Obtain doors and frames from a single manufacturer.

1.07 DELIVERY, STORAGE, AND HANDLING

.1 Perform in accordance with Section 01 61 00 - Common Product Requirements and CSDMA Guide Specification for Installation and Storage of Hollow Metal Doors and Frames.

.2 Delivery and Acceptance Requirements: Deliver materials to site in original factory packaging with manufacturer's labels.
.1 Provide temporary protection during delivery and site storage to prevent distortion, surface damage, and rust.
.2 After arrival on site, remove wet wrapping materials, inspect doors and frames for damage, and notify delivery company and supplier if damage is found.
.3 Minor damage may be repaired if refinished products match new work, and are acceptable to Consultant.

.3 Storage and Handling Requirements:
.1 Store materials off ground, in a dry, well-ventilated indoor location, in a manner that prevents sagging, bowing, or twisting, and in accordance with manufacturer's recommendations, and CSDMA Guide Specification for Installation and Storage of Hollow Metal Doors and Frames.
.2 Store with space between stacked doors to allow air circulation.
.3 Store and protect steel doors and frames from nicks, scratches, and distortion.

1.08 SITE CONDITIONS

.1 Site Measurements: Before fabrication, verify actual dimensions of openings by

measuring on site, and indicate actual measurements on shop drawings. Coordinate fabrication schedule with construction progress to avoid delaying the Work.

.2 Established Dimensions: When site measurements cannot be made without delaying the Work, establish dimensions and proceed with fabricating doors and frames without site measurements. Coordinate site construction to ensure that actual site dimensions correspond to established dimensions.

1.09 WARRANTY

.1 Manufacturer's Warranty: Submit manufacturer's standard warranty.

2 PRODUCTS

2.01 REGULATORY REQUIREMENTS

.1 Steel Fire-Protection Rated Doors, Frames, and Screens: Labelled and listed by an organization accredited by Standards Council of Canada in conformance with CAN/ULC-S104 and CAN/ULC-S105 for ratings indicated.

.2 Affix appropriate label to each opening indicating the labelling requirement, as follows:
- .1 At standard size openings: Fire endurance rating
- .2 At oversized openings: Unclassified as to fire rating

2.03 PERFORMANCE REQUIREMENTS

.1 Design exterior frame assembly to accommodate expansion and contraction when subjected to a minimum and maximum surface temperature of -35°C to 35°C.

.2 Maximum deflection for exterior steel entrance screens under wind load of 1.2 kPa not to exceed 1/175th of span.

.3 Steel Fire-Rated Doors and Frames: Labelled and listed by an organization accredited by Standards Council of Canada in conformance with CAN/ULC-S104 for ratings specified or indicated.

.4 Provide fire labelled frames for openings requiring fire protection ratings. Test products in conformance with CAN/ULC-S106 and listed by a nationally recognized agency having factory inspection services.

2.04 MATERIALS

.1 Exterior Doors and Frames : Metallic coated steel sheets in accordance with ASTM A 924/A 924M, coated to ASTM A 653/A 653M, Commercial Steel (CS), Type B, ZF120galvannealed, stretcher levelled standard of flatness where used for face sheets.

.3 Metallic Coated Steel Sheet Thickness: Minimum thickness in accordance with CSDMA, Recommended Specifications for Commercial Steel Door and Frame Products, Table 1

and Appendix 1,SDI-111.

.4 Reinforcement Channels: To CSA G40.20/G40.21, Type 44W, coating designation to ASTM A 653/6 53M, ZF75.

.6 Composites: Balance of core materials used in conjunction with lead, in accordance with manufacturer's proprietary design.

2.05 DOOR CORE MATERIALS

.1 Honeycomb: Structural small cell, maximum [25] -mm kraft paper, minimum [36] kg weight per ream, minimum [16.5] kg/m³ density, and sanded to required thickness.

.2 Fibreglass with Vertical Steel Stiffeners: To CAN/ULC-S702, semi-rigid type, density 24 kg/m³, face sheets laminated.

2.06 ADHESIVES

.1 Honeycomb Core and Steel Component Adhesive: Heat resistant, spray grade, polyurethane.

.2 Polystyrene and Polyurethane Core Adhesive: Heat resistant, epoxy resin based, low viscosity, contact cement.

.3 Lock-Seam Edge Adhesive: Fire resistant, resin reinforced polychloroprene, high viscosity, sealant/adhesive.

2.07 ACCESSORIES

.1 Touch-up Primer: To CAN/CGSB-1.181

.2 Isolation Coating: Epoxy resin solution

.3 Exterior Top Caps: Rigid polyvinylchloride extrusion conforming to CGSB 41-GP-19Ma

.4 Interior Top Caps: Steel

.5 Frame Thermal Breaks: Not required

.6 Door Bottom Seal: Not required

.7 Door Silencers/Bumpers: Single stud neoprene type, black colour. Self-adhesive type silencers are not acceptable.

.8 Metallic Paste Filler: To manufacturer's standard.

.9 Fire Labels: Metal riveted.

.10 Floor Anchors and Channel Spreaders: 1.60-mm nominal tee anchors, 1.19-mm wall stud anchors, and provide anchors appropriate to site conditions, as follows:

.1 Exterior Locations: Hot-dipped, zinc-coated
.2 At Masonry: Corrugated, galvanized tee anchors or heavy gauge galvanized wire ties
.3 Drilled stud anchors for wire tie to studs

.11 Exposed Fasteners: stainless steel to ASTM A 167.

2.08 FABRICATION - FRAMES

.1 Fabricate frames in accordance with CSDMA Recommended Dimensional Standards for Commercial Steel Doors and Frames.

.2 Fabricate frames to profiles and maximum face sizes as indicated.

.3 Exterior Frames: 1.6mm welded type construction.

.5 Blank, reinforce, drill, and tap frames for mortised, templated hardware, and electronic hardware using templates provided by finish hardware supplier. Reinforce frames for surface-mounted hardware.

.6 Protect mortised cut-outs with steel guard boxes.

.7 Reinforce frames for surface-mounted hardware.

.8 Prepare door openings for door silencers:
.1 Three silencers on strike jamb for single door openings.
.2 Two silencers on heads for double door openings.

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

.10 Conceal fastenings except where exposed fastenings are indicated.

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

.12 Insulate exterior frame components with polyurethane insulation.

.13 Provide fire labelled frame products for openings requiring fire protection ratings, as scheduled. Test products in conformance with CAN/ULC-S104, CAN/ULC-S106, NFPA 252 and list by a nationally recognized agency having factory inspection services and construct as detailed in Follow-Up Service Procedures/Factory Inspection Manuals issued by listing agency to individual manufacturers.

2.09 FRAME ANCHORAGE

.1 Provide concealed anchorage to floor and wall construction.

.2 Locate each wall anchor immediately above or below each hinge reinforcement on hinge

jamb and directly opposite on strike jamb.

.3 Provide 2 anchors for rebate opening heights up to 1520 mm, and one additional anchor for each additional 760 mm of height or fraction thereof.

.4 Locate anchors for frames in previously placed concrete, masonry or structural steel a maximum 150 mm from top and bottom of each jamb and intermediate anchors at a maximum 660 mm on centre.

2.10 FRAMES - WELDED TYPE

.1 Perform welding to CSA W59.

.3 Accurately mitre or mechanically joint frame product and securely weld on inside of profile.

.4 Cope accurately and securely weld butt joints of mullions, transom bars, centre rails, and sills.

.5 Grind welded joints and corners to flat plane, fill with metallic paste, and sand to uniform smooth finish.

.6 Securely attach floor anchors to inside of each jamb profile.

.7 Weld in two temporary jamb spreaders per frame to maintain proper alignment during shipment.

2.11 FABRICATION - FRAMES, KNOCKED-DOWN TYPE

.1 Ship knocked-down type frames unassembled.

.2 Provide frames with mechanical joints which interlock securely and provide functionally satisfactory performance when assembled and installed in accordance with CSDMA Guide Specification for Installation and Storage of Hollow Metal Doors and Frames.

.3 Securely attach floor anchors to inside of each jamb profile.

2.12 FABRICATION - DOORS, GENERAL

.1 Doors: Swing type, flush, with provision for openings as indicated.

.2 Exterior Doors: Insulated fiberglass core construction.

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

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

.5 Reinforce doors for surface-mounted hardware where required. Provide flush PVC top

caps to exterior doors.

.6 Prepare doors for recessed mounting of automatic door bottoms where scheduled in Section 08 71 00 - Door Hardware.

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

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

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

3 EXECUTION

3.01 EXAMINATION

.1 Verification of Conditions: Verify conditions of substrates previously installed under other Sections or Contracts are acceptable for steel doors and frames 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.

3.02 INSTALLATION - GENERAL

.1 Install doors and frames to CSDMA Guide Specification for Installation and Storage of Hollow Metal Doors and Frames.

.2 Install fire-rated doors and frames in accordance with NFPA 80.

.3 Isolate steel from direct contact with dissimilar metals, concrete, and masonry.

3.03 INSTALLATION - FRAMES

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

.2 Secure anchorages and connections to adjacent construction.

.3 Brace frames rigidly in position until built-in:
- .1 Remove temporary jamb spreaders.
- .2 Provide temporary wood spreaders at third points of frame rebate height to maintain frame width until adjacent building-in work completed.
- .3 Provide vertical support at centre of head for openings exceeding 1200 mm in

width.

.4 Remove wood spreaders after frames have been built-in.

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

.5 Fill rough opening with low pressure spray-applied polyurethane foam to AAMA 812.

.6 Install door silencers.

3.04 INSTALLATION - DOOR HARDWARE

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

3.05 SITE QUALITY CONTROL

.1 Tolerances: Provide even margins between doors and jambs, and doors and finished floor and thresholds as follows.

.1 Hinge Side: 1.0 mm

.2 Latch Side and Head: 1.5 mm

.3 Finished floor Maximum 19 mm

.4 Refer to Section 01 91 13 - General Commissioning Requirements for commissioning requirements.

3.07 ADJUSTING

.1 Use primer to touch-up finishes damaged during installation.

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

.3 Repair damage to zinc coatings in accordance with ASTM A 780/A 780M.

.4 Repair damage to adjacent materials caused by metal doors and frames installation.

.5 Adjust operable parts for correct function.

3.08 CLEANING

.1 Progress Cleaning: Perform in accordance with Section 01 74 00 - Cleaning, and as follows:

.1 Remove traces of primer, sealants, epoxy, and filler materials. Clean doors and frames.

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

.2 Final Cleaning: Perform in accordance with Section 01 74 00 - Cleaning.

3.09 PROTECTION

.1 Protect installed products and components from damage during construction. Install temporary protective covering to exposed components.

.2 Protect thresholds, hardware, frames, doors, from damage. Lock operative door bottom in up position.

END OF SECTION

OVERHEAD RAPID COILING DOORS

PART 1 – GENERAL

1.01 SUMMARY

A. Section includes high-speed, rigid overhead coiling doors, activation devices and accessories.

1.02 ADMINISTRATIVE REQUIREMENTS

A. Coordination: Verify the work of this Section with project conditions for compliance with Contract Documents. Coordinate overhead rapid coiling door's operating controls with activation devices and specified accessories.

1.03 ACTION SUBMITTALS

A. See Section 01 30 00 – Administrative Requirements for submittal procedures.

B. Product Data: For each type and size of overhead rapid coiling door, activation device, and accessory, include detailed information of fabricated materials and finishes, wind load resistance, and electrical component connections.

C. Shop Drawings: Indicate pertinent dimensioning, component profiles, and anchorage locations for verification of proper fit and mounting. Include Setting Drawings and templates, with locations for built-in or embedded anchoring devices, a summary of forces, loads and weights on walls and jambs and the Manufacturer's Installation & Maintenance Manual – English.

D. Samples: submit 1 set door panel material for each panel type option selected. Sample sizes to be no smaller than 12" (305mm) long, 6" (152mm) x 6" (152mm), or full size as appropriate to materials.

1.04 QUALITY ASSURANCE

A. Regulatory Agency Approvals: Items requiring electrical connection in this section shall be listed and classified by UL/ULC or testing firm acceptable to Authorities Having Jurisdiction as suitable for purpose specified.

B. Qualifications:
   1. Suppliers: Obtain overhead rapid coiling doors, including all components and accessories though one source. Use only new doors, components, and accessories for this project.
   2. Installers: Engage companies specializing in performing work of the type specified in this section and authorized by manufacturer.

1.05 DELIVERY, STORAGE AND HANDLING

Delivery and Acceptance Requirements: Verify completeness of shipment upon receipt of materials. Confirm delivery of all component parts with original shipping manifest.

Storage and Handling Requirements: Store all materials in dry locations with adequate ventilation, free from dust, water, and available for inspection and handling.

1.06 WARRANTY

See Section 01 77 00 – Closeout Submittals for additional warranty requirements.

Warranty Documentation: Provide a final executed warranty document as accepted by Owner; include in Warranties and Bonds Manual.

Warranty Period:
The motor to be guaranteed against defects in materials and workmanship for a period of 5 years. All other mechanical and electrical components to be warranted against defects for a period of 2 years. Insulated panels to be warranted against defects for a period of 2 years. Vision/Ventilated panels to be warranted against defects for a period of 7 years. During the warranty period, labor is to be covered for the first year after installation is completed.

PART 2 – PRODUCTS

2.01 MANUFACTURERS

A. Hörmann High Performance Doors.
117 Starpointe Boulevard, Burgettstown, Pennsylvania 15021-9506
Toll Free: (800)-365-3667 | Phone: 724-385-9150
Website: www.hormann.us | Contact Email Address: info2@hormann.us

B. Products Options: Provide the following as to be considered the basis of design:
1. High Performance Door Model: Speed-Guardian™ Series – Low Profile Model 5000 CLP U 42.

C. Substitution Limitations:
1. Requests for approval of equal substitutions will be considered in accordance with provisions of Section 01 60 00.

2.02 PERFORMANCE REQUIREMENTS

A. Structural Performance Requirements: Provide door assemblies capable of withstanding gravity loads and stresses without permanent deformation of the door components.
1. Resistance to Wind Load: Uniform pressure (velocity pressure) acting inward (pressure) and outward (suction) of wind acting normal to plane of wall as determined in accordance with ASTM E330-02, FBC-TAS 202-94, or ANSI/DASMA 108-2012, Exposure B:
a. Door widths up to 16’- 0” (4.87 m): 21.0 psf. (1,006 Pa); Wind Load Class 5; 115 mph (185 km/h).

B. Operation-Speed Requirements: Open cycle performing up-to 60 in./sec. (1.5 m/s) and close cycle performing at up-to 20 in./sec. (0.5 m/s).

C. Operation-Cycle Requirements: Acting for not less than 1,000,000 total cycles.

D. Headroom Clearance Requirements: Door openings up to 14’- 9” (4.5 m) high, HR = 36-¼” (920.0 mm), door openings up to 16’- 0” (4.87 m) high, HR = 37-⅝” (956.0 mm). Doors with Hood Enclosure option, include additional 1-⅝” (40 mm).

E. Resistance to Water Penetration Requirements: No less than Class 2, 15 minutes water spray at 55 Pa differential at panel joints.

F. Solar Heat Gain Coefficient (G-value) of Door Curtain Vision Material Requirements: No less than G 0.74 for transparent panels.

G. Visible Transmittance (T_{vis}) of Door Curtain Vision Material Requirements: No less than T_{vis} 0.77 for transparent panels.

2.03 OPERATION

A. Electric Door Operator (Drive System): 5 Horsepower variable speed motor capable of gradual acceleration and braking.

B. Door Control Devices: One (manufacturer supplied) Control Panel per unit, required.
   1. Control Panel: Heated Three-Phase Model: Hörmann XL49819 Smart Start™ NXT with Plug & Play wiring. Housing (W x H x D): 15-¾" x 23-⅝" x 7-⅞" (400 x 600 x 200 mm). NEMA Type 4X / IP66 compliant, UL/cUL listed. Supply Voltage (from Electrical Disconnect): 3-Phase, 208 vAC to 575 vAC, 60 Hz, 20 Amp Class CC fuse. Control Panel Weight: 16 lbs. (7.25 kg).
      a. Finish: Polyester Powder Coat Painted, baked-on steel. Color RAL (to be determined by consultant), all surfaces.

C. Activation Devices: Provide door activations as noted on Door and Hardware Schedules including locations, quantities, and types and in coordination with Section 08 71 10
   1. Manufacturer Recommended Door Activation Device: BEA, Inc.: LZR®-WIDESCAN, Motion, Presence & Safety Sensor.Mounting Extension Bracket. Quantity: One (1).
   2. Door Activation Devices: Triple Push Button Control: MMTC, Inc.: 3BXL, NEMA 4 Exterior Three-button with Lockout - Surface Mounted Control Station. Integrated keyed lockout. NEMA Type 4 rated. Triangular button pattern configuration.

D. Emergency Operation / Disconnect Device: Provide one Electrical Disconnect Device (switch) for each overhead rapid coiling door installed. Emergency manual operation via disconnect of power to the motor and chain hoist. Hand crank operation not accepted.

2.04 MATERIALS

A. Top Assembly Components:
   1. Spiral Guides, Mounting Brackets (1 Pair): Provide one non-contact galvanized spiral panel guide and mounting bracket per each jamb. Panel wheel guides shall be aluminum.
   2. Top/Bottom Spiral Support Channels: Provide one top and one bottom 11-gauge galvanized steel spiral support channel(s).
   3. Motor Bracket: One motor bracket at the operator side of the door shall be provided.
   4. Drive Shaft: Provide one drive shaft, to be fabricated of galvanized cold rolled steel, 1-½" (38.0 mm) diameter.
   5. Drive Shaft Support: Doors with an opening width of 11'- 6" (3.5 m) and up to 16'- 0" (4.87 m) shall have one drive shaft support.
   6. Top Assembly Component Finishes:Finish: Polyester Powder Coat Painted, baked-on steel. Color to be selected by Consultant from RAL Classic Color System, (Spiral Guides, Mounting Brackets, Top/Bottom Spiral Support Channels, Motor Bracket).

B. Guide Tracks: Fabricated jamb guides constructed with Manufacturer's standard heavy-duty materials arranged with a continuous, vertical oriented, one-piece design and removable front covers to meet specified performance criteria; allowing door panels to operate smoothly.
   1. Guide Tracks Finish:
      Polyester Powder Coat Painted, baked-on steel. Color selected from manufacturer's RAL Classic Color System by Consultant, (Tracks & Removable Front Covers).

C. Door Curtain Seals: Twin black, PVC brush seals at throat of the guide tracks, with one Lintel seal for the full width of the top of the door, vinyl-loop style. Color: Black. Bottom Panel: Rubber, field serviceable seal for the Bottom Profile Panel of the door to ensure close fit with uneven thresholds and floors, Color: Black.

D. Entrapment Protection Equipment: In-line Light Curtain System installed within Guide Tracks in compliance with UL 325 Standard for Safety, Door, Drapery, Gate, Louver, and Window Operators and Systems. Photoelectric sensors and electric reversing edges shall not be accepted as primary entrapment protection equipment.

E. Door Curtain Counterbalancing: Products shall not require counterbalancing weight or springs to operate. No exceptions considered.

F. Door Curtain Panels: Refer to Drawings for intended panel configurations, types, and options. Product Door Panels to consist of heavy-duty materials, designed to withstand wind loading indicated, in a continuous length for width of each door opening (without splices).
   1. Insulated Panel(s): Interlocking flat-faced insulated steel panels, with neoprene rubber thermal break at panel joints (tops). Factory Material Textures: Spiral side face to be Micrograin™ texture and Non-Spiral Side face to be Stucco texture.
      a. Finish: Polyester Powder Coat Painted, baked-on steel. Color selected by Consultant from RAL Classic Color System, [Both Faces].
   2. Ventilation Panel(s): Refer to Drawings for design intent per door type. Interlocking flat-faced, hollow extruded aluminum frames with neoprene rubber thermal break at panel joints (tops) and ventilation areas fitted with double-walled perforated aluminum sheet material at 1” (25 mm) air space. Material perforation pattern to allow for minimum 56.3% open area per sheet.
      Color Finish: Polyester Powder Coat Painted, baked-on aluminum. Color selected by Consultant from RAL Classic Color System, [Both Faces].
   3. Bottom Profile Panel: Interlocking flat-faced insulated steel panel, including neoprene rubber thermal break at panel top, and black EPDM rubber threshold door curtain seal at panel bottom. Factory Material Textures: Spiral side face to be Micrograin™ texture and Non-Spiral Side face to be Stucco texture. Automatic reversing edge mechanisms in bottom profile will not be accepted as a primary entrapment protection device. Bottom Profile Panel color finishes to coordinate with Primary Curtain Panel color finishes. Consult manufacturer for applications with custom Bottom Profile Panel lower-edge angles conforming to sloped threshold conditions. Additional entrapment protection safety features are required for Sloped Bottom Profiles (Photoelectric Sensor).

G. Other Door Curtain Component(s):
   1. Intermediate Panel Connectors:(at each panel joint) For gap control spacing and sag between panels, to be spaced according to manufacturer’s set intervals at interior face of door. Standard Color: Light Grey.

2.05 FABRICATION

A. Factory Production: Do not release doors for fabrication until all specified submittal materials have been reviewed, processed, and returned by the Consultant as acceptable.

B. Safety Labeling: Affix 'High Performance Door Warning Label' to one guide track vertically at a readable height, (5-feet) (1.5 m) above the bottom of track. Use only Door and Access Systems Manufacturers' Association, (DASMA) created warning labels.

2.06 FINISHES

A. Appearance of Finished Work: All components as provided, of overhead rapid coiling doors shall be factory finished. Noticeable variations of finish quality in the same piece are not acceptable.

B. Finishing System: Top Assembly, Guide Tracks, Curtain Panels, and Hood Enclosures: baked-on polyester powder coat paint. Color as selected from RAL Classic color system.

2.07 ACCESSORIES

A. General: Refer to Drawings including Door Schedules for basis of design for accessories, intended configurations, quantities, types, options, and remarks.
B. LED Lite-Advance System: Hörmann: Door operation indicating LED light strip safety system. Quantity: One (1) set. Provide flat retainer profiles for installation.

PART 3 – EXECUTION

3.01 EXAMINATION

A. Verification of Conditions: The doorway opening should be square and plumb, free of intrusion from obstructions, door threshold should be level, and host wall of sound construction and structural integrity to achieve the best possible installation.

3.02 PREPARATION

A. Coordinate installation of overhead rapid coiling doors with other trades prior to commencement of work. Exterior doorway openings should be weatherproofed, flashed, and ready to receive finishes prior to commencing installation. Repair or replace damaged substrate materials and hold installation procedures until repairs are complete.

3.03 INSTALLATION

A. General: Comply with manufacturer's detailed written instructions for the installation of overhead rapid coiling doors.
   1. Installation may require the use of powered platforms, man-lifts, and vehicle-mounted work platforms.
   2. High voltage electrical field wiring to be performed by registered electricians experienced, trained, and qualified to perform the work.
   3. Verify the quality of the mounting structure for suitability to perform as required. Inspect for signs of damage, premature wear.
   4. Handle all materials with care. Do not attempt to rectify or reuse damaged parts without express approval from the manufacturer.

B. Exterior Mounted Hoods: Continue weather barrier system behind Hood. DO NOT expose sheathing, framing members, or building insulation behind Hood without weather barrier protection.

C. Tolerances: the door must be installed in an opening that is the products manufactured finished size.

3.04 SYSTEMS STARTUP, ADJUSTING, CLEANING

A. Initial Operation: Before initial operation of the door and putting into service, check that it is in good working order and free of defects.
   1. Test Run: After installing the door, test the functional safety. Operate the door no fewer than 30 cycles during the testing phase. Verify proper working order of all safety components, including Emergency-Off button.

B. Starting and Adjusting: After successful completion of Test Run, examine lift system components for proper wear. adjust doors to operate easily, free from warp, twist, or distortion and fitting weather-tight for entire perimeter of opening.

C. Cleaning and Care: During construction operations Installer shall provide progress cleaning that minimizes accumulation of dirt, dust, ice, snow, and standing water. Verify all protective films have been removed from the door prior to final cleaning.
   1. Use warm water together with a neutral, non-abrasive cleaning agent (household detergent, pH value 7, Isopropanol 99.9%).
   2. To clean the surface, use ONLY a soft cloth. Rinse off any dirt, dust, snow or ice particles with clean water. Never scrape ice, snow or foreign materials from the door. DO NOT rub over the panels when dry, otherwise risk of scratching the surface finish may occur.

3.05 CLOSEOUT ACTIVITIES

A. Demonstration and Training: It shall be the responsibility of the Installer to demonstrate safe operating procedure of the overhead rapid coiling door to the Owner's appointed staff or representative. Start-up Services: Engage a factory-authorized service representative to train and educate facilities maintenance personnel for ongoing management and maintenance of the door.

3.06 PROTECTION, MAINTENANCE

A. Protecting Installed Construction: Overhead rapid coiling doors not yet in use may be vulnerable to impact damage and abrasions. Protect completed work from accidental damage after installation, and prior to acceptance by the Owner. Doors not in use should be set out with safety cones, caution tape and signage noting the door as not operational.

B. Maintenance Intervals: Consult Product Owner's Manual for proper maintenance and testing requirements. Cleaning the door curtain is recommended as needed for removal of dirt accumulation.

END OF SECTION

OVERHEAD RAPID COILING DOORS

PART 1 – GENERAL

1.01 SUMMARY

A. Section includes high-speed, rigid overhead coiling doors, activation devices and accessories.

1.02 ADMINISTRATIVE REQUIREMENTS

A. Coordination: Verify the work of this Section with project conditions for compliance with Contract Documents. Coordinate overhead rapid coiling door's operating controls with activation devices and specified accessories.

1.03 ACTION SUBMITTALS

A. See Section 01 30 00 – Administrative Requirements for submittal procedures.

B. Product Data: For each type and size of overhead rapid coiling door, activation device, and accessory, include detailed information of fabricated materials and finishes, wind load resistance, and electrical component connections.

C. Shop Drawings: Indicate pertinent dimensioning, component profiles, and anchorage locations for verification of proper fit and mounting. Include Setting Drawings and templates, with locations for built-in or embedded anchoring devices, a summary of forces, loads and weights on walls and jambs and the Manufacturer's Installation & Maintenance Manual – English.

D. Samples: submit 1 set door panel material for each panel type option selected. Sample sizes to be no smaller than 12" (305mm) long, 6" (152mm) x 6" (152mm), or full size as appropriate to materials.

1.04 QUALITY ASSURANCE

A. Regulatory Agency Approvals: Items requiring electrical connection in this section shall be listed and classified by UL/ULC or testing firm acceptable to Authorities Having Jurisdiction as suitable for purpose specified.

B. Qualifications:
   1. Suppliers: Obtain overhead rapid coiling doors, including all components and accessories though one source. Use only new doors, components, and accessories for this project.
   2. Installers: Engage companies specializing in performing work of the type specified in this section and authorized by manufacturer.

1.05 DELIVERY, STORAGE AND HANDLING

Delivery and Acceptance Requirements: Verify completeness of shipment upon receipt of materials. Confirm delivery of all component parts with original shipping manifest.

Storage and Handling Requirements: Store all materials in dry locations with adequate ventilation, free from dust, water, and available for inspection and handling.

1.06 WARRANTY

See Section 01 77 00 – Closeout Submittals for additional warranty requirements.

Warranty Documentation: Provide a final executed warranty document as accepted by Owner; include in Warranties and Bonds Manual.

Warranty Period:
The motor to be guaranteed against defects in materials and workmanship for a period of 5 years. All other mechanical and electrical components to be warranted against defects for a period of 2 years. Insulated panels to be warranted against defects for a period of 2 years. Vision/Ventilated panels to be warranted against defects for a period of 7 years. During the warranty period, labor is to be covered for the first year after installation is completed.

PART 2 – PRODUCTS

2.01 MANUFACTURERS

A. Hörmann High Performance Doors.
117 Starpointe Boulevard, Burgettstown, Pennsylvania 15021-9506
Toll Free: (800)-365-3667 | Phone: 724-385-9150
Website: www.hormann.us | Contact Email Address: info2@hormann.us

B. Products Options: Provide the following as to be considered the basis of design:
1. High Performance Door Model: Speed-Guardian™ Series – Low Profile Model 5000 CLP U 42.

C. Substitution Limitations:
1. Requests for approval of equal substitutions will be considered in accordance with provisions of Section 01 60 00.

2.02 PERFORMANCE REQUIREMENTS

A. Structural Performance Requirements: Provide door assemblies capable of withstanding gravity loads and stresses without permanent deformation of the door components.
1. Resistance to Wind Load: Uniform pressure (velocity pressure) acting inward (pressure) and outward (suction) of wind acting normal to plane of wall as determined in accordance with ASTM E330-02, FBC-TAS 202-94, or ANSI/DASMA 108-2012, Exposure B:
a. Door widths up to 16’- 0” (4.87 m): 21.0 psf. (1,006 Pa); Wind Load Class 5; 115 mph (185 km/h).

B. Operation-Speed Requirements: Open cycle performing up-to 60 in./sec. (1.5 m/s) and close cycle performing at up-to 20 in./sec. (0.5 m/s).

C. Operation-Cycle Requirements: Acting for not less than 1,000,000 total cycles.

D. Headroom Clearance Requirements: Door openings up to 14’- 9” (4.5 m) high, HR = 36-¼” (920.0 mm), door openings up to 16’- 0” (4.87 m) high, HR = 37-⅝” (956.0 mm). Doors with Hood Enclosure option, include additional 1-⅝” (40 mm).

E. Resistance to Water Penetration Requirements: No less than Class 2, 15 minutes water spray at 55 Pa differential at panel joints.

F. Solar Heat Gain Coefficient (G-value) of Door Curtain Vision Material Requirements: No less than G 0.74 for transparent panels.

G. Visible Transmittance (T_{vis}) of Door Curtain Vision Material Requirements: No less than T_{vis} 0.77 for transparent panels.

2.03 OPERATION

A. Electric Door Operator (Drive System): 5 Horsepower variable speed motor capable of gradual acceleration and braking.

B. Door Control Devices: One (manufacturer supplied) Control Panel per unit, required.
   1. Control Panel: Heated Three-Phase Model: Hörmann XL49819 Smart Start™ NXT with Plug & Play wiring. Housing (W x H x D): 15-¾" x 23-⅝" x 7-⅞" (400 x 600 x 200 mm). NEMA Type 4X / IP66 compliant, UL/cUL listed. Supply Voltage (from Electrical Disconnect): 3-Phase, 208 vAC to 575 vAC, 60 Hz, 20 Amp Class CC fuse. Control Panel Weight: 16 lbs. (7.25 kg).
      a. Finish: Polyester Powder Coat Painted, baked-on steel. Color RAL (to be determined by consultant), all surfaces.

C. Activation Devices: Provide door activations as noted on Door and Hardware Schedules including locations, quantities, and types and in coordination with Section 08 71 10
   1. Manufacturer Recommended Door Activation Device: BEA, Inc.: LZR®-WIDESCAN, Motion, Presence & Safety Sensor.Mounting Extension Bracket. Quantity: One (1).
   2. Door Activation Devices: Triple Push Button Control: MMTC, Inc.: 3BXL, NEMA 4 Exterior Three-button with Lockout - Surface Mounted Control Station. Integrated keyed lockout. NEMA Type 4 rated. Triangular button pattern configuration.

D. Emergency Operation / Disconnect Device: Provide one Electrical Disconnect Device (switch) for each overhead rapid coiling door installed. Emergency manual operation via disconnect of power to the motor and chain hoist. Hand crank operation not accepted.

2.04 MATERIALS

A. Top Assembly Components:
   1. Spiral Guides, Mounting Brackets (1 Pair): Provide one non-contact galvanized spiral panel guide and mounting bracket per each jamb. Panel wheel guides shall be aluminum.
   2. Top/Bottom Spiral Support Channels: Provide one top and one bottom 11-gauge galvanized steel spiral support channel(s).
   3. Motor Bracket: One motor bracket at the operator side of the door shall be provided.
   4. Drive Shaft: Provide one drive shaft, to be fabricated of galvanized cold rolled steel, 1-½" (38.0 mm) diameter.
   5. Drive Shaft Support: Doors with an opening width of 11'- 6" (3.5 m) and up to 16'- 0" (4.87 m) shall have one drive shaft support.
   6. Top Assembly Component Finishes:Finish: Polyester Powder Coat Painted, baked-on steel. Color to be selected by Consultant from RAL Classic Color System, (Spiral Guides, Mounting Brackets, Top/Bottom Spiral Support Channels, Motor Bracket).

B. Guide Tracks: Fabricated jamb guides constructed with Manufacturer's standard heavy-duty materials arranged with a continuous, vertical oriented, one-piece design and removable front covers to meet specified performance criteria; allowing door panels to operate smoothly.
   1. Guide Tracks Finish:
      Polyester Powder Coat Painted, baked-on steel. Color selected from manufacturer's RAL Classic Color System by Consultant, (Tracks & Removable Front Covers).

C. Door Curtain Seals: Twin black, PVC brush seals at throat of the guide tracks, with one Lintel seal for the full width of the top of the door, vinyl-loop style. Color: Black. Bottom Panel: Rubber, field serviceable seal for the Bottom Profile Panel of the door to ensure close fit with uneven thresholds and floors, Color: Black.

D. Entrapment Protection Equipment: In-line Light Curtain System installed within Guide Tracks in compliance with UL 325 Standard for Safety, Door, Drapery, Gate, Louver, and Window Operators and Systems. Photoelectric sensors and electric reversing edges shall not be accepted as primary entrapment protection equipment.

E. Door Curtain Counterbalancing: Products shall not require counterbalancing weight or springs to operate. No exceptions considered.

F. Door Curtain Panels: Refer to Drawings for intended panel configurations, types, and options. Product Door Panels to consist of heavy-duty materials, designed to withstand wind loading indicated, in a continuous length for width of each door opening (without splices).
   1. Insulated Panel(s): Interlocking flat-faced insulated steel panels, with neoprene rubber thermal break at panel joints (tops). Factory Material Textures: Spiral side face to be Micrograin™ texture and Non-Spiral Side face to be Stucco texture.
      a. Finish: Polyester Powder Coat Painted, baked-on steel. Color selected by Consultant from RAL Classic Color System, [Both Faces].
   2. Ventilation Panel(s): Refer to Drawings for design intent per door type. Interlocking flat-faced, hollow extruded aluminum frames with neoprene rubber thermal break at panel joints (tops) and ventilation areas fitted with double-walled perforated aluminum sheet material at 1” (25 mm) air space. Material perforation pattern to allow for minimum 56.3% open area per sheet.
      Color Finish: Polyester Powder Coat Painted, baked-on aluminum. Color selected by Consultant from RAL Classic Color System, [Both Faces].
   3. Bottom Profile Panel: Interlocking flat-faced insulated steel panel, including neoprene rubber thermal break at panel top, and black EPDM rubber threshold door curtain seal at panel bottom. Factory Material Textures: Spiral side face to be Micrograin™ texture and Non-Spiral Side face to be Stucco texture. Automatic reversing edge mechanisms in bottom profile will not be accepted as a primary entrapment protection device. Bottom Profile Panel color finishes to coordinate with Primary Curtain Panel color finishes. Consult manufacturer for applications with custom Bottom Profile Panel lower-edge angles conforming to sloped threshold conditions. Additional entrapment protection safety features are required for Sloped Bottom Profiles (Photoelectric Sensor).

G. Other Door Curtain Component(s):
   1. Intermediate Panel Connectors:(at each panel joint) For gap control spacing and sag between panels, to be spaced according to manufacturer’s set intervals at interior face of door. Standard Color: Light Grey.

2.05 FABRICATION

A. Factory Production: Do not release doors for fabrication until all specified submittal materials have been reviewed, processed, and returned by the Consultant as acceptable.

B. Safety Labeling: Affix 'High Performance Door Warning Label' to one guide track vertically at a readable height, (5-feet) (1.5 m) above the bottom of track. Use only Door and Access Systems Manufacturers' Association, (DASMA) created warning labels.

2.06 FINISHES

A. Appearance of Finished Work: All components as provided, of overhead rapid coiling doors shall be factory finished. Noticeable variations of finish quality in the same piece are not acceptable.

B. Finishing System: Top Assembly, Guide Tracks, Curtain Panels, and Hood Enclosures: baked-on polyester powder coat paint. Color as selected from RAL Classic color system.

2.07 ACCESSORIES

A. General: Refer to Drawings including Door Schedules for basis of design for accessories, intended configurations, quantities, types, options, and remarks.
B. LED Lite-Advance System: Hörmann: Door operation indicating LED light strip safety system. Quantity: One (1) set. Provide flat retainer profiles for installation.

PART 3 – EXECUTION

3.01 EXAMINATION

A. Verification of Conditions: The doorway opening should be square and plumb, free of intrusion from obstructions, door threshold should be level, and host wall of sound construction and structural integrity to achieve the best possible installation.

3.02 PREPARATION

A. Coordinate installation of overhead rapid coiling doors with other trades prior to commencement of work. Exterior doorway openings should be weatherproofed, flashed, and ready to receive finishes prior to commencing installation. Repair or replace damaged substrate materials and hold installation procedures until repairs are complete.

3.03 INSTALLATION

A. General: Comply with manufacturer's detailed written instructions for the installation of overhead rapid coiling doors.
   1. Installation may require the use of powered platforms, man-lifts, and vehicle-mounted work platforms.
   2. High voltage electrical field wiring to be performed by registered electricians experienced, trained, and qualified to perform the work.
   3. Verify the quality of the mounting structure for suitability to perform as required. Inspect for signs of damage, premature wear.
   4. Handle all materials with care. Do not attempt to rectify or reuse damaged parts without express approval from the manufacturer.

B. Exterior Mounted Hoods: Continue weather barrier system behind Hood. DO NOT expose sheathing, framing members, or building insulation behind Hood without weather barrier protection.

C. Tolerances: the door must be installed in an opening that is the products manufactured finished size.

3.04 SYSTEMS STARTUP, ADJUSTING, CLEANING

A. Initial Operation: Before initial operation of the door and putting into service, check that it is in good working order and free of defects.
   1. Test Run: After installing the door, test the functional safety. Operate the door no fewer than 30 cycles during the testing phase. Verify proper working order of all safety components, including Emergency-Off button.

B. Starting and Adjusting: After successful completion of Test Run, examine lift system components for proper wear. adjust doors to operate easily, free from warp, twist, or distortion and fitting weather-tight for entire perimeter of opening.

C. Cleaning and Care: During construction operations Installer shall provide progress cleaning that minimizes accumulation of dirt, dust, ice, snow, and standing water. Verify all protective films have been removed from the door prior to final cleaning.
   1. Use warm water together with a neutral, non-abrasive cleaning agent (household detergent, pH value 7, Isopropanol 99.9%).
   2. To clean the surface, use ONLY a soft cloth. Rinse off any dirt, dust, snow or ice particles with clean water. Never scrape ice, snow or foreign materials from the door. DO NOT rub over the panels when dry, otherwise risk of scratching the surface finish may occur.

3.05 CLOSEOUT ACTIVITIES

A. Demonstration and Training: It shall be the responsibility of the Installer to demonstrate safe operating procedure of the overhead rapid coiling door to the Owner's appointed staff or representative. Start-up Services: Engage a factory-authorized service representative to train and educate facilities maintenance personnel for ongoing management and maintenance of the door.

3.06 PROTECTION, MAINTENANCE

A. Protecting Installed Construction: Overhead rapid coiling doors not yet in use may be vulnerable to impact damage and abrasions. Protect completed work from accidental damage after installation, and prior to acceptance by the Owner. Doors not in use should be set out with safety cones, caution tape and signage noting the door as not operational.

B. Maintenance Intervals: Consult Product Owner's Manual for proper maintenance and testing requirements. Cleaning the door curtain is recommended as needed for removal of dirt accumulation.

END OF SECTION

PART 1 - GENERAL

1.1 **General Requirements**

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

1.2 **Referenced Standards**

1.2.1	CAN/CGSB-85.100-M93	Painting
1.2.2	SSPC-SP6	Steel Structures Painting Council, Commercial Blast Cleaning Standard
1.2.3	ASTM D523-89	Standard Test Method for Specular Gloss.

1.3 **Submittals**

1.3.1 Samples

.1 Submit 2 Drawdowns of every colour required in accordance with Section 01 33 00. Include a complete list of paint and finish materials to be used, showing the name of the manufacturer, the catalogue number, grade and quality of the materials proposed for use.

.2 Colours shall match those specified in the Finishes Schedule.

.3 Apply samples of finishes in a testing area in the building in the presence of the Consultant. Apply samples with the correct material, number of coats, colour, texture and degree of gloss required. Refinish if required, until approval of the Consultant is obtained. Location of testing area shall be as approved by the Consultant.

.4 Leave test areas undisturbed until completion of the work. Approved work in the test area shall serve as a standard for similar work throughout the project. Work which does not match the approved finishes shall be corrected and refinished at no expense to the Owner.

1.3.2 List of Materials: Submit a list of materials proposed for use on the work, for review at least thirty (30) days before the materials are required. The list shall bear the manufacturer's official certification that the materials listed thereon are the best quality made by the company.

1.3.3 Extra Materials: Supply Owner with one clearly identified sealed 3.78 litre can of each colour and type of paint, stain, and varnish for this work for future maintenance. Take such materials to designated storage area in the building.

1.4 Product Delivery, Storage, and Handling

1.4.1 Storage and Safety Precautions: Store containers of paint, varnish, thinner, and other volatile materials in well-ventilated designated room under lock and key, where they will not be exposed to excessive heat or direct rays of the sun. Keep containers tightly closed when not in actual use. Remove used cloths from building every night, and when not in use. Take precautions against spontaneous combustion by burning, drenching in water, or placing in air-tight covered metal containers. Provide CO_2 fire extinguisher of 9 kg. capacity in this room while area is used for paint storage.

1.4.2 Protection: Protect the work of other trades from damage. Post signs at freshly-painted surfaces immediately following their completion. Any soiling of concrete pavement attributable to this section due to spillage, mixing of material, or any other cause whatsoever, to be entirely reinstated under this Section at no expense to the Owner.

1.5 Job Conditions

1.5.1 Environmental Temperature: Do not paint or finish in unclean or improperly ventilated areas. Maintain ambient and substrate temperatures and humidity conditions within acceptable limits as recommended by paint manufacturer.

1.5.2 Application Requirements:

- .1 Apply paint finish in areas where dust is no longer being generated by related construction operations or when wind or ventilation conditions are such that airborne particles will not affect quality of finished surface.
- .2 Apply paint to adequately prepared surfaces and to surfaces within moisture limits noted herein.
- .3 Apply paint when previous coat of paint is dry or adequately cured.
- .4 Apply paint finishes when conditions forecast for entire period of application fall within manufacturer's recommendations.
- .5 Do not apply paint when:
  - .1 Temperature is expected to drop below 10 degrees C before paint has thoroughly cured.
  - .2 Substrate and ambient air temperatures are expected to fall outside MPI or paint manufacturer's limits.
  - .3 Surface to be painted is wet, damp or frosted.
- .6 Provide and maintain cover when paint must be applied in damp or cold weather. Heat substrates and surrounding air to comply with temperature and humidity conditions specified by manufacturer. Protect until paint is dry or until weather conditions are suitable.
- .7 Schedule painting operations such that surfaces exposed to direct, intense sunlight are scheduled for completion during early morning.

.8 Remove paint from areas which have been exposed to freezing, excess humidity, rain, snow or condensation. Prepare surface again and repaint.

.9 Paint occupied facilities in accordance with approved schedule only. Schedule operations such that painted surfaces will have dried and cured sufficiently before occupants are affected.

1.5.3 Protection

.1 Provide metal pans or adequate tarpaulins to protect floors in areas assigned for the storage and mixing of paints.

.2 Use sufficient drop cloths and protective coverings for the full protection of floors, furnishings, woodwork, windows, and work not being painted. Protect mechanical, electrical, and special equipment hardware, all other components of the building which do not require painting from paint spotting and other soiling during the painting process.

.3 Leave above areas clean and free from evidence of occupancy upon completion of painting.

.4 Protect paint materials from fire and freezing.

.5 Keep waste rags in metal drums containing water, and remove from building at end of each working shift.

1.5.4 Lighting: Provide a minimum of 761 lux, (75 footcandles) lighting on surfaces to be painted.

1.6 **Interior Paint Gloss Terms**

1.6.1 Gloss Terms: To ASTM D523-89 shall have following values:

Gloss Term	Gloss Value
Flat	0 to 10
Eggshell (Satin)	15 to 25
Semi-Gloss	45 to 55
Gloss, medium	60 to 80
Gloss, high	80 to 90.

PART 2 - PRODUCTS

2.1 **Materials**

2.1.1 Paint Primers and Finish

.1 Environmentally friendly, solvent free, highest grade, first line quality product of the manufacturer. Painting and finishing materials shall comply with or exceed CAN2-85-100 for Premium Grade Work and comply with the specified generic formula guide in accordance with the manufacturer's recommendations.

2.01 ACCEPTABLE MANUFACTURER

.1 Sherwin Williams

Design based on Sherwin Williams products

.2 Requests for approval of equal substitutions will be considered in accordance with provisions of Section 01 60 00.

2.02 PRODUCTS

Existing Surfaces

.1 Substrate: Steel (Existing, currently painted)
Finish: Macropoxy 646 fast cure epoxy, b58-62-, B58V620, 2 coats

New Surfaces

.2 Substrate: Steel Structure
Primer: Macropoxy 646 fast cure epoxy B58-620, B58V620, 1 Coat
Finish: Acrolon 218 HS Acrylic Polyurethane B65-650 SG, B65V600, 2 coats

.3 Miscellaneous Metal constructions
Primer: Macropoxy 646 fast cure epoxy B58-620, B58V620, 1 Coat
Finish: Acrolon 218 HS Acrylic Polyurethane B65-650 SG, B65V600, 2 Coats

.4 Hollow Metal doors and frames
Primer: Macropoxy 646 fast cure epoxy B58-620, B58V620, 1 Coat
Finish:Acrolon 218 HS Acrylic Polyurethane B65-650 SG, B65V600, 2 Coats

2.03 COLOURS

.1 Consultant will provide Colour Schedule after Contract award.

.2 Colour schedule will be based upon selection of 5 base colours and 3 accent colours. No more than 8 colours will be selected for entire project and no more than 3 colours will be selected in each area.

.3 Selection of colours will be from manufacturers full range of colours.

.4 Where specific products are available in restricted range of colours, selection based on limited range.

.5 Second coat in three coat system to be tinted slightly lighter colour than top coat to show visible difference between coats, if requested by Consultant

.6 For deep and ultra deep colours; 4 coats may be required.

2.04 MIXING AND TINTING

.1 Perform colour tinting operations prior to delivery of paint to site. Obtain written approval from Consultant for tinting of painting materials.

.2 Mix paste, powder or catalyzed paint mixes in accordance with manufacturer's written instructions.

.3 Use and add thinner in accordance with paint manufacturer's recommendations. Do not use kerosene or similar organic solvents to thin water-based paints.

.4 Thin paint for spraying in accordance with paint manufacturer's instructions.

.5 Re-mix paint in containers prior to and during application to ensure break-up of lumps, complete dispersion of settled pigment, and colour and gloss uniformity. Strain as necessary.

2.05 GLOSS/SHEEN RATINGS

.1 Paint gloss is defined as sheen rating of applied paint, in accordance with following values:

Gloss @ 60 degrees	Sheen @ 85 degrees
Gloss Level 1 - Matte Finish (flat)	Max. 5	Max. 10
Gloss Level 2 - Velvet-Like Finish	Max.10	10 to 35
Gloss Level 3 - Eggshell Finish	10 to 25	10 to 35
Gloss Level 4 - Satin-Like Finish	20 to 35	min. 35
Gloss Level 5 - Traditional Semi-Gloss Finish	35 to 70	
Gloss Level 6 - Traditional Gloss	70 to 85	
Gloss Level 7 - High Gloss Finish	More than 85	

.2 Gloss level ratings of painted surfaces as noted on Finish Schedule.

PART 3 - EXECUTION

3.1 Inspection

3.1.1 Verify all surfaces with electric moisture meter and do not proceed if reading is higher than 12-15, without written permission from Consultant.

3.1.2 Proceed with work only when surfaces and conditions are satisfactory for production of a first-class job.

3.1.3 Remove dust, grease, rust, and extraneous matter from all surfaces, except that rust occurring on items specified to be primed under other Sections shall be removed and work reprimed under those Sections.

3.2 Preparation

3.2.1 Concrete and Masonry

.1 Test surfaces for alkalinity with pink litmus paper or other standard industry method.

.2 Where extreme alkalinity occurs, wash surface with 4% solution tetrapotassium pyrophosphate where latex base paint is to be used, and with zinc sulphate solution where other paint bases are to be used.

.3 Etch normal concrete surface to receive alkyd paint with commercial muriatic acid solution (1 part to 20 parts water by volume). Follow with complete rinsing with clean water.

.4 Rub down surfaces of different textures and remove mortar spots and sharp edges with a scraper. Patch where required. Fill masonry and concrete surfaces with block filler to fill all holes and pores.

3.2.2 Gypsum and Cement Board: Inspect to ensure properly filled joints, sand smooth. Fill small nicks or holes with patching compound and sand smooth.

3.2.3 Unprimed Ferrous Metal Surfaces: clean with power tools to SSPC-SP3 specifications before application of the primer coat.

3.2.4 Galvanized and Pre-Primed Surfaces

.1 New Metal With Wipe Coated Galvanizing: Thoroughly clean to remove all grease, oil, dirt and all other contaminants which may be present on the surface. Mineral Spirits or Xylol are acceptable solvents to use for this purpose - that is, to remove grease, oil, dirt and similar contaminants. Remove scale by wirebrushing.

.2 Weathered Metal and Wipe Coated Galvanizing: For old and weathered galvanized, wipe coat galvanized surfaces and preprimed metal, thorough surface preparation is essential - to ensure that all contaminants have been removed from the surface and pretreat as for New Metal.

.3 Spangled Type Galvanizing: Treat with vinyl wash primer to provide proper bond for paint finish.

3.2.5 Mask and cover all surrounding surfaces to provide neat, clean, true juncture lines, and to keep paint from adjacent surfaces. Protect floor finishes from splashings.

3.2.6 Mask labels and specification plates occurring on equipment to be painted and ULC labels on doors and frames.

3.2.7 Re-seal all cut edges of wood doors, if the material was cut subsequent to initial sealing. Seal or prime the tops and bottoms of wood doors.

3.3 **Workmanship**

3.3.1 Apply work using skilled tradesmen working under direction of a capable foreman, and according to manufacturer's specifications; in a workmanlike manner; with suitable clean equipment in good condition; in dust-free and under adequate illumination and suitable conditions for production of best results; evenly, uniform in sheen, colour and texture, free from brush marks, sags, crawls, runs, or other defects detrimental to appearance or performance; and in a manner to prevent spattering or spilling over finished surfaces.

3.3.2 Mix paint on site and use unadulterated, except where specified otherwise in manufacturer's directions.

3.3.3 Use same brand of paint for primer, intermediate, and finish coats.

3.3.4 Do not apply succeeding coats until preceding coat is dry and hard.

3.3.5 Lighten preceding coats 25% white (tint white coats) from the colour called for in the Colour and Material Schedule.

3.3.6 It is generally intended that material be applied by brush or roller. Spray painting will be permitted in areas where advantageous, but Consultant shall be consulted and shall approve each area before spray painting commences. Consultant may at any time prohibit the use of spray painting for such reasons during application as carelessness, poor masking, or protective measures, paint fogs drifting into prepainted surfaces or other finishes, disturbance to other trades, or failure to obtain a dense, even, opaque finish.

3.3.7 Sand lightly between coats with No. 00 sandpaper.

3.3.8 Do not apply last coat of varnish on stained wood surfaces until all gloss varnish applications have been inspected and approved by the Consultant.

3.3.9 Finish exposed edges of doors to match face of door. Seal hidden edges of wood core doors with two coats of gloss varnish or two coats of paint. Paint exposed raw edges of plywood doors to match faces. Fill all open end grain of wood doors and plywood with filler after first coat application.

3.4 **Application**

3.4.1 Follow manufacturer's preparation and application instructions.

3.4.2 Paint all exposed surfaces where specifically noted on Room, Material and Finish Schedule.

3.4.3 Unless specifically noted, do not paint stainless steel, chrome, baked enamel, plastic laminate, glass, tile, porcelain enamel, ceramic surfaces, equipment name or specification plates, fire resistance labels, washroom fixtures, manhole and catch basin covers, floors or sprinkler heads. Make good paint finish on items where painted surfaces have become marred or defaced.

3.4.4 Examine the Drawings and Specifications for the work of other sections regarding the provisions for prime and finish coats. Paint or finish all materials installed throughout the project which are required to be painted and which are left unfinished or unpainted by other sections. The only exception to this requirement is where the Drawings, specifications or schedules state positively and explicitly that a surface is not to be finish painted.

3.4.5 In areas where painting is not called for, painting is not required, with the following exceptions, which require paint: plywood backboards, all other exposed wood, all exposed ferrous metals (even if galvanized), and mechanical and electrical services, equipment and hangers (including exterior rooftop mechanical and electrical units) and interior of coat closets. Colours selected by Consultant.

3.4.6 Paint glazing rebates and stops of hollow-metal sections before glass is installed.

3.4.7 Paint fire hose cabinets, on or near finished surface shall to match the colour of the surface on which the article appears, except where noted otherwise on Schedules.

3.4.8 Identification paint schedule as follows:

.1 Fire protection system: red, alkyd enamel.

.2 Systems posing safety hazards: yellow, alkyd enamel.

.3 Safe systems: green, alkyd enamel.

3.4.9 Do not paint circuit breakers, switches, and receptacles, or similar electrical components.

3.4.10 For finished interior wood that is to be painted, apply one coat of approved best grade white interior trim primer, reduced with thinners in accordance with manufacturer's printed directions, to ALL surfaces of wood as soon as material is delivered and before it is built in. Use brushes for applying material to interior wood.

3.4.11 Repaint the entire plane of areas showing incomplete coverage.

3.4.12 Do not paint over ULC labels on doors and frames and over identification labels on mechanical and electrical equipment.

3.4.13 "Cut in" @ corners and or wall ceiling junctions.

3.5 **Formulae**

3.5.1 The following Formulae are intended to provide completely opaque surfaces.If surfaces are not completely opaque and uniform, apply additional coats at no additional cost to the Owner.

3.5.2 Consult Consultant before painting any surface not included in the formulae as listed.

3.5.3 Unless noted otherwise in finish schedule, use the following sheens:

.1 Painted doors, frames, trim - semi-gloss.

.2 Gypsum board for ceilings and walls - eggshell.

.3 Janitors rooms, kitchens, garbage rooms, basement corridors, and basement washrooms - semi-gloss.

.4 For masonry - semi-gloss.

3.5.4 <u>Painting Existing Work</u>

.1 Prime and finish paint all existing surfaces of the building that are identified to be repainted and that are marred, altered or disturbed in any way or when latex paint is being used over alkyd or a gloss surface to match colour and finish of existing surfaces unless otherwise indicated. For damaged paint extend painting to a suitable boundary to avoid a "patched" effect. Sand, wire-brush, or scrape such existing finished surfaces to remove loose paint and to reduce gloss. Also clean existing films of all dirt, grease, or wax. If

metallic surfaces are rusted, remove loose scale to provide a firm surface. Patch and sand cracks and other imperfections.

.2 Prime all surfaces with the primer specified for the particular type of surface and then apply finish coats as specified, to both existing films and primed surfaces.

END OF SECTION