Simcoe County District School Board

Coldwater Public School

Interior Classroom Renovations and Improvements

33 Gray Street, Coldwater, Ontario

"Issued for Permit and Tender"

Project 24009

DATE April 18th, 2024

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End of Section

PART 1 GENERAL

Dwg. No.	Title	Issue No.	Rev. No.	Issue Date
000	OBC Matrix and List of Drawings	3	-	April 18, 2024
Architectural				
A201	Overall Ground Floor Plan	3	-	April 18, 2024
A202	Enlarged Ground Floor Demo Plan	3	-	April 18, 2024
A203	Enlarged Ground Floor Plan	3	-	April 18, 2024
A204	Enlarged Ground Floor Demo RCP Plan	3	-	April 18, 2024
A205	Enlarged Ground Floor RCP Plan	3	-	April 18, 2024
A701	Interior Elevations	3	-	April 18, 2024
A702	Interior Elevations	3	-	April 18, 2024
A703	Interior Elevations	3	-	April 18, 2024
A704	Interior Elevations	3	-	April 18, 2024
A801	Millwork Sections	3	-	April 18, 2024
A901	Room Finish Schedule	3	-	April 18, 2024

Mechanical				
M1.1	Key Plan, Schedules & Legend	3	-	April 18, 2024
M2.1	Enlarged Ground Floor Part Plan Mechanical Demo	3	-	April 18, 2024
M2.2	Enlarged Ground Floor Part Plan Mechanical Reno	3	-	April 18, 2024
M3.0	Mechanical Specification	3	-	April 18, 2024
Electrical				
E101	Key Plan, Legend, Schedules and Details	3	-	April 18, 2024
E201	Partial Ground Floor – Lighting Demolition Plan	3	-	April 18, 2024
E202	Partial Ground Floor – Power and Systems Demolition Plan	3	-	April 18, 2024
E301	Partial Ground Floor – Lighting Renovation Plan	3	-	April 18, 2024
E302	Partial Ground Floor – Power and Systems Renovation Plan	3	-	April 18, 2024

End of Section

PART 1 GENERAL

1.1 Section Includes

.1 Work covered by contract documents
.2 Location of the site
.3 Site access
.4 Contractor traffic route
.5 Work sequence
.6 Contractor use of premises
.7 References and codes
.8 Engineer design
.9 Hazardous material discovery
.10 Building smoking environment
.11 Special conditions
.12 Site security
.13 Protection of Drawings

1.2 Work Covered by Contract Documents

.1 Work of this Contract comprises the construction of the **Simcoe County District School Board Coldwater Public School Interior Classroom Renovations and Improvements,** for the Simcoe County District School Board, and as indicated on the drawings and specifications.

1.3 Location of Site

.1 The Work of this Contract is located 33 Gray Road, Coldwater, Ontario.

1.4 Imperial Project

.1 All dimensions are to be shown in inches and feet.

1.5 Site Access

.1 Access to the site to be arranged by the Owner.

1.6 Contractor Traffic Route

.1 Maintain fire department access/control.

1.7 Work Sequence

.1 Construct Work continuously.

1.8 Contractors Use of Premises

.1 Contractor has restricted use of site until Substantial Performance or school re-occupancy.

.2 The school will be partially occupied during construction. The Contractor shall provide all necessary barriers and hoardings to separate and protect occupied areas from surrounding partially occupied areas.

.3 Provide noise control or complete noisy operations which may affect occupants at times as agreed with the Owner. All noisy work must be completed during the school summer shut down.

.4 Complete work in occupied areas at times when agreed with the Owner. Schedule work which will disrupt services or school operations use during off hours.

1.9 References and Codes

.1 Perform Work in accordance with Ontario Building Code (OBC), National Fire Code of Canada (NFC), the Canadian Electrical Code CSA C22.1-18, and other codes of provincial or local application provided that in case of conflict or discrepancy, more stringent requirements apply.

.2 Meet or exceed requirements of:
.1 Contract documents.
.2 Specified standards, codes and referenced documents.

1.10 Engineer Design

.1 Where specifications require work to be designed by an engineer, engage an engineer licensed in the Province of Ontario to design such work.

1.11 Hazardous Material Discovery

.1 Refer to Designated Substance Survey – Limited Designated Substance Survey Report

.2 All abatement work must be completed in accordance with all applicable regulations and guidelines.

.3 Should any other material not identified in the above referenced report material and resembling asbestos or other hazardous substances be encountered in course of demolition work, immediately stop work and notify the Consultant. Refer to Section 01 41 00.

1.12 Verification

.1 All dimensions shall be verified on site, and all necessary modifications and adjustments shall be made as necessary to suit.

1.13 Building Smoking Environment

.1 Smoking is prohibited in all workplaces on Simcoe County District School Board property.

1.14 Special Conditions

.1 The following general and special conditions apply:
.1 All existing surfaces and finishes are to be repaired wherever damaged during the course of the Work.
.2 Wherever existing flooring and wall finishes are to be removed, include full removal down to the existing substrate of all tile, base, mortars, grouts, waterproofing membranes and adhesives in accordance with TTMAC recommended procedures. Patch and repair existing substrate to the quality required by the new finish material manufacturer for the installation of their products.
.3 All openings in existing fire rated assemblies or fire separations which are created by the removal of existing services, plumbing, conduit, ductwork, fittings fixtures or accessories are to be firestopped to maintain the integrity of the existing construction.
.4 All exposed interior surfaces except prefinished surfaces shall be painted whether referred to in the specifications and drawings or not.
.5 Terrazzo repairs through the corridors shall be completed through the cash allowance.

.6 Projectors, whiteboards, and tackboards shall be coordinated and installed by the general contractor.

1.15 "By Others"

.1 The term "by others" where it is used in the contract documents means that work shown or described in the contract documents and labeled with this designation is not included in the specific sub-trade's scope of work, but will be required to be done within the General Contractor's contract.

1.16 Use of Drawings

.1 Drawings are not to be scaled.

.2 Copies of architectural and structural "issued for construction" drawings in digital format will be made available for the contractors use under the following conditions.
- .1 Copyright remains with BBA.
- .2 The drawings will only be used for shop drawings for this project and not be put to any other use.
- .3 BBA assumes no liability for errors or omissions in the drawings. The Contractor assumes all risk and expenses associated with the use of drawings in the production of his work.
- .4 References to BBA and other Consultants must be deleted from the title block.
- .5 The Contractor signs a release available from BBA that addresses the above items in more detail.

.3 Arrangements for use of sub-consultant drawings must be made with the appropriate sub-consultant.

1.17 Protection of Drawings

.1 Copyright of electronic document belongs to the Consultant. Electronic documents may not be forwarded to others, transmitted, downloaded or reproduced in any format, whether print or electronic, without the express, written permission of the copyright owner.

.2 Drawings, specifications and other contract related documents which are posted on Contractor controlled websites for access by sub-trades and suppliers, shall be posted only on password protected and secure websites approved by the Consultant to limit access to those with an expressed interest in the Project.

.3 Provide Consultant and Owner with access to such websites as noted above.

PART 2 PRODUCTS

2.1 Not Used

.1 Not used

PART 3 EXECUTION

3.1 Not Used

.1 Not used

End of Section

PART 1 GENERAL

1.1 Consultants

.1	Architect:	Barry Bryan Associates 201 - 250 Water Street Whitby, Ontario L1N 0G5 Tel: (905) 666-5252 Fax: (905) 666-5256
.2	Structural Engineer:	Barry Bryan Associates 201 - 250 Water Street Whitby, Ontario L1N 0G5 Tel: (905) 666-5252 Fax: (905) 666-5256
.3	Mechanical Engineer:	DEI Consulting Engineers
.4	Electrical Engineer:	DEI Consulting Engineers

End of Section

PART 1 GENERAL

1.1 Section Includes

.1 Cash Allowances

1.2 References

.1 Canadian Construction Documents Committee CCDC2-2020, Stipulated Price Contract including the Supplementary Conditions.

1.3 Cash Allowances

.1 Refer to General Conditions, GC4.1.

.2 Unless otherwise specified, Cash Allowances shall cover the cost of the materials and equipment delivered F.O.B. job site, and all applicable taxes, except Harmonized Sales Tax. The Contractor's handling costs on the site, labour, installation costs, overhead and profit and other expenses shall be included separately in the Stipulated Price and not in the Cash Allowance.

.3 Where it is specified that a Cash Allowances is to include both supply and installation costs, such allowances shall cover the cost of the materials and equipment delivered and unloaded at the site, all applicable taxes and the contractor’s handling costs on the site, labour and installation costs and other expenses, except overhead and profit which shall be included separately in the Stipulated Price.

.4 If the cost of the Work covered by Cash Allowances, when determined, is more or less than the allowance, the Contract Sum shall be adjusted accordingly.

.5 In the event that the cost of the work covered by Cash Allowances should exceed the cash allowance, while the contract sum will be adjusted in conformity therewith, there shall be no adjustment to the Contractor's fee or other expenses such as overhead or profit, it being understood and agreed that the contract sum includes the Contractor's expenses and profit for all Cash Allowances whether or not they are exceeded.

.6 Progress payments on accounts of work authorized under Cash Allowances shall be included in monthly certificate for payment.

.7 Expenditures from Cash Allowances shall be authorized by Change Directive or Change Order.

.8 Cash Allowance for independent inspection and testing shall cover the cost of such services as provided by independent testing agency only. The Contractor's cost for labour, overhead and other expenses related to independent inspection and testing shall be included separately in the Stipulated Price and not in the Cash Allowance.

.9 Cause the work covered by Cash Allowances to be performed for such amounts and by such persons as the Consultant may select and direct or as required by the project drawings and specifications.

.10 Refer to Instructions to Bidders, for list of Cash Allowances.

PART 2 PRODUCTS

2.1 Not Used

.1 Not used

PART 3 EXECUTION

3.1 Not Used

.1 Not used

End of Section

PART 1 GENERAL

1.1 Section Includes

.1 Requests for Information
.2 Submittal procedures
.3 Screening of RFI's
.4 Response to RFI's
.5 Response Timing

1.2 Request for Information (RFI)

.1 A request for information (RFI) is a formal process used during the Work to obtain an interpretation of the Contract Documents or to obtain additional information.
.2 An RFI shall not constitute notice of claim for a delay.

1.3 Submittal Procedures

.1 Make submittals in accordance with Section 01 33 00 – Submittal Procedures.
.2 Number RFI's consecutively in one sequence in order submitted, in numbering system as established by the Contractor.

.3 Submit one distinct subject per RFI form. Do not combine unrelated items on one form.

.4 RFI form:
  .1 Submit a draft "Request for Information" form to be approved by the Owner and Consultant.
  .2 Submit RFI's to the Consultant on approved "Request for Information" form. The Consultant shall not respond to an RFI except as submitted on this form.
  .3 Where RFI form does not have sufficient space to provide complete thereon, attach additional sheets as required.
  .4 Submit with RFI form all necessary supporting documentation.

.5 RFI log:
  .1 Maintain log of RFI's sent to and responses received from the Consultant, complete with corresponding dates.
  .2 Submit updated log of RFI's at each construction meeting and with each application for payment submission.

.6 Submit RFI's sufficiently in advance of affected parts of the Work so as not to cause delay in the performance of the Work. Costs resulting from failure to do so will not be paid by the Owner.

.7 Only the Contractor shall submit RFI's to the Consultant.

.8 RFI's submitted by Subcontractors or Suppliers directly to the Consultant will not be accepted.

1.4 Screening of RFI's

.1 Contractor shall satisfy itself that an RFI is warranted by undertaking a thorough review of the Contract Documents to determine that the claim, dispute, or other matters in question relating to the performance of the Work or the Interpretation of the Contract Documents cannot be resolved by direct reference to the Contract Documents. Contractor shall describe in detail this review on the RFI form as part of the RFI submission. RFI submittals that lack such detailed review description, or where the detail provided is, in the opinion of the Consultant, insufficient, shall not be reviewed by the Consultant and shall be rejected.

1.5 Response to RFI's

.1 Consultant shall review RFI's from the Contractor submitted in accordance with this section with the following understandings:
.1 Consultant's response shall not be considered as a Change Order or Change Directive, nor does it authorize changes in the Contract Price or Contract Time or changes in the Work.
.2 Only the Consultant shall respond to RFI's. Responses to RFI's received from entities other than the Consultant shall not be considered.

1.6 Response Timing

.1 Allow 5 Working Days for review of each RFI by the Consultant.

.2 Consultant's review of RFI commences on date of receipt of RFI submission by the Consultant from Contractor and extends to date RFI returned by Consultant.

.3 When the RFI submission is received by Consultant before noon, review period commences that day. When RFI submittal is received by Consultant after noon, review period begins on the next Working Day.

.4 If, at any time, the Contractor submits a large enough number of RFI's or the Consultant considers the RFI to be of such complexity that the Consultant cannot process these RFI's within 5 Working Days, the Consultant will confer with the Contractor within 3 Working Days of receipt of such RFI's, and the Consultant and the Contractor will jointly prepare an estimate of the time necessary for processing same as well as an order of priority among the RFI's submitted. The Contractor shall accommodate such necessary time at no increase in the Contract Time and at no additional cost to the Owner.

PART 2 PRODUCTS

2.1 Not Used

.1 Not used

PART 3 EXECUTION

3.1 Not Used

.1 Not used

End of Section

PART 1 GENERAL

1.1 Section Includes

.1 Preconstruction Conference
.2 Project Meetings
.3 On Site Documents
.4 Schedules
.5 Closeout Procedures
.6 Cost Breakdown

1.2 Preconstruction Conference

.1 The Consultant will call for and administer Preconstruction Conference at time and place to be announced.

.2 Contractor, all major Subcontractors, and major suppliers shall attend the Preconstruction Conference.

.3 Agenda will include, but not be limited to, the following items.
  .1 Lines of communication and contact information
  .2 Schedules
  .3 Review of long lead items
  .4 Personnel and vehicle permit procedures
  .5 Use of premises
  .6 Location of any Contractor on-Site facilities
  .7 Security
  .8 Housekeeping
  .9 Submittal and RFI procedures
  .10 Inspection and testing procedures, on-Site and off-Site
  .11 Control and reference point survey procedures
  .12 Health and Safety
  .13 Contractor's Schedule of Values
  .14 Contractor's Schedule of Submittals

.4 The Consultant will distribute copies of minutes to attendees. Attendees shall have seven (7) days to submit comments or additions to minutes. Minutes will constitute final documentation of results of Preconstruction Conference.

1.3 Project Meetings

.1 The Contractor will arrange project meetings and assume responsibility for setting times and recording and distributing minutes within 72 hours of the meeting.

1.4 On-Site Documents

.1 Maintain at job site, one copy each of the following:
  .1 Contract drawings.
  .2 Specifications.
  .3 Addenda.
  .4 Reviewed shop drawings.
  .5 Requests for Information (RFI's)
  .6 Change orders.
  .7 Other modifications to Contract.

.8 Field test reports.
.9 Copy of approved Work schedule.
.10 Manufacturers' installation and application instructions.
.11 Health and Safety Plan and Other Safety Related Documents.
.12 Other documents as specified.

1.5 Schedules

.1 Submit a construction progress schedule to Consultant within 10 working days of the Contract award and at least 10 working days prior to the submission of the first progress claim. The construction progress schedule must show anticipated progress stages and final completion of the work within the time periods required by the Contract documents.

.2 During progress of Work revise and resubmit as directed by Consultant.

.3 The current project schedule shall be tabled at each regular site meeting.

PART 2 PRODUCTS

2.1 Not Used

.1 Not used

PART 3 EXECUTION

3.1 Not Used

.1 Not used

End of Section

PART 1 GENERAL

1.1 Section Includes

.1 Submittals
.2 Schedules Required
.3 Format
.4 Submission
.5 Critical Path Scheduling
.6 Submittals Schedule

1.2 Submittals

.1 Make submittals in accordance with Section 01 33 00 – Submittal Procedures.

1.3 Schedules Required

.1 Submit schedules as follows:
  .1 Construction Progress Schedule.
  .2 Submittal Schedule for Shop Drawings and Product Data.
  .3 Submittal Schedule for Samples.
  .4 Product Delivery Schedule.
  .5 Cash Allowance Schedule for purchasing Products.
  .6 Shutdown or closure activity.

1.4 Format

.1 Prepare schedule in form of a horizontal bar chart using Microsoft Project 2010 or later.

.2 Provide a separate bar for each major item of work, trade or operation.

.3 Split horizontally for projected and actual performance.

.4 Provide horizontal time scale identifying first work day of each week.

.5 Format for listings: chronological order of start of each item of work.

.6 Identification of listings: By Systems description.

1.5 Submission

.1 Submit initial format of schedules within 15 working days after award of Contract.

.2 Submit schedules in electronic format, by email as PDF files.

.3 Consultant will review schedule and return review copy within 10 days after receipt.

.4 Resubmit finalized schedule within 7 days after return of review copy.

.5 Submit revised progress schedule with each application for payment.

.6 Distribute copies of revised schedule to:
  .1 Job site office.
  .2 Subcontractors.

.3 Other concerned parties.
.4 Instruct recipients to report to Contractor within 10 days, any problems anticipated by timetable shown in schedule.

.7 Table current and up to date schedule and a two week look-ahead schedule at each regular site meeting.

1.6 Critical Path Scheduling

.1 Include complete sequence of construction activities.

.2 Schedules shall represent a practical plan to complete the work within the Contract period, and shall convey the plan to execute the work. Schedules as developed shall show the sequence and interdependencies of activities required for complete performance of the work.

.3 The submittal of schedules shall be understood to be the Contractor's representation that the schedule meets the requirements of the Contract Documents and that the work will be executed in the sequence and duration indicated in the schedule.

.4 Failure to include any element of work required for performance of the Contract or failure to properly sequence the work shall not excuse the Contractor from completing all work within the Contract Time.

.5 All schedules shall be developed utilizing industry standard 'best practices' including, but not limited to:
.1 No open-ended activities.
.2 No use of constraints other than those defined in the Contract Documents without the prior approval of the Consultant.
.3 No negative leads or lags.
.4 No excessive leads or lags without prior justification and approval from the Consultant.
.5 For individual schedule construction activities, do not exceed 14 days in duration without prior approval of the Consultant. Subdivide activities exceeding 14 days in duration to an appropriate level.
.6 Sufficiently describe schedule activities to include what is to be accomplished in each work area. Express activity durations in whole days. Clearly define work that is to be performed by subcontract.
.7 Create the schedule in conformance with the work-hours and constraints set forth in these Contract Documents.

.6 Include dates for commencement and completion of each major element of construction as follows.
.1 Mobilization
.2 Demolition
.3 Masonry work
.4 Drywall and acoustics
.5 Ceramic tiling
.6 Compartments, cubicles
.7 Fixtures and fittings
.8 Painting
.9 Mechanical
.10 Electrical

.7 Show projected percentage of completion of each item as of first day of month.

.8 Indicate progress of each activity to date of submission schedule.

.9 Show changes occurring since previous submission of schedule:
- .1 Major changes in scope.
- .2 Activities modified since previous submission.
- .3 Revised projections of progress and completion.
- .4 Other identifiable changes.

.10 Provide a narrative report to define:
- .1 Problem areas, anticipated delays, and impact on schedule.
- .2 Corrective action recommended and its effect.
- .3 Effect of changes on schedules of other prime contractors.

1.7 Submittals Schedule

.1 Include schedule for submitting shop drawings, product data, and samples. Indicate manufacture and delivery lead times into the shop drawing submittal schedule.

.2 Indicate dates for submitting, review time, resubmission time, and last date for meeting fabrication schedule.

PART 2 PRODUCTS

2.1 Not Used

.1 Not used

PART 3 EXECUTION

3.1 Not Used

.1 Not used

End of Section

PART 1 GENERAL

1.1 Section Includes

.1 Administrative
.2 Requests for Information (RFI's)
.3 Shop Drawings and Product Data
.4 Interference Drawings
.5 Samples
.6 Mock-Ups
.7 Certificates and Transcripts

1.2 Administrative

.1 Submit to Consultant submittals listed for review. Submit promptly and in orderly sequence to not cause delay in Work. Failure to submit in ample time is not considered sufficient reason for extension of Contract Time and no claim for extension by reason of such default will be allowed.

.2 Work affected by submittal shall not proceed until review is complete.

.3 Present shop drawings, product data, samples and mock-ups in metric units.

.4 Where items or information is not produced in metric units converted values are acceptable.

.5 Review submittals prior to submission to Consultant. This review represents that necessary requirements have been determined and verified, or will be, and that each submittal has been checked and coordinated with requirements of Work and Contract Documents. Submittals not stamped, signed, dated and identified as to specific project will be returned without being examined and considered rejected.

.6 Notify Consultant in writing at time of submission, identifying deviations from requirements of Contract Documents stating reasons for deviations.

.7 Verify field measurements and affected adjacent work are coordinated.

.8 Contractor's responsibility for errors and omissions in submission is not relieved by Consultant's review.

.9 Contractor's responsibility for deviations in submission from requirements of Contract Documents is not relieved by Consultant's review.

.10 Keep one reviewed copy of each submission on site.

1.3 Requests for Information (RFI's)

.1 Refer to Section 01 26 15 – Requests for Information

1.4 Shop Drawings and Product Data

.1 The term "shop drawings" means drawings, diagrams, illustrations, schedules, performance charts, brochures and other data which are to be provided to illustrate details of a portion of Work.

.2 Coordinate each submission with requirements of work and Contract Documents. Individual submissions will not be reviewed until all related information is available.

.3 Submit shop drawings bearing stamp and signature of qualified professional Engineer registered or licensed in the Province of Ontario where required by the individual specification sections. Each submittal and each resubmittal must bear the stamp of the Engineer

.4 Indicate materials, methods of construction and attachment or anchorage, erection diagrams, connections, explanatory notes and other information necessary for completion of Work. Where articles or equipment attach or connect to other articles or equipment, indicate that such items have been coordinated, regardless of Section under which adjacent items will be supplied and installed. Indicate cross references to design drawings and specifications.

.5 Allow ten (10) days for Consultant's review of each submission.

.6 Adjustments made on shop drawings by Consultant are not intended to change Contract Price. If adjustments affect value of Work, state such in writing to Consultant prior to proceeding with Work.

.7 Make changes in shop drawings as Consultant may require, consistent with Contract Documents. When resubmitting, notify Consultant in writing of revisions other than those requested.

.8 Accompany submissions with transmittal letter containing:
- .1 Date.
- .2 Project title and number.
- .3 Contractor's name and address.
- .4 Identification and quantity of each shop drawing, product data and sample.
- .5 Other pertinent data.

.9 Submissions shall include:
- .1 Date and revision dates.
- .2 Project title and number.
- .3 Name and address of:
  - .1 Subcontractor.
  - .2 Supplier.
  - .3 Manufacturer.
- .4 Contractor's stamp, signed by Contractor's authorized representative certifying approval of submissions, verification of field measurements and compliance with Contract Documents.
- .5 Details of appropriate portions of Work as applicable:
  - .1 Fabrication.
  - .2 Layout, showing dimensions, including identified field dimensions, and clearances.
  - .3 Setting or erection details.
  - .4 Capacities.
  - .5 Performance characteristics.
  - .6 Standards.
  - .7 Operating weight.
  - .8 Wiring diagrams.
  - .9 Single line and schematic diagrams.
  - .10 Relationship to adjacent work.

.10 After Consultant's review, distribute copies.

.11 Submit 3 prints plus one electronic copy in PDF format of shop drawings for each requirement requested in specification Sections and as Consultant may reasonably request.

.12 Submit electronic copy in PDF format of product data sheets or brochures for requirements requested in Specification Sections and as requested by Consultant where shop drawings will not be prepared due to standardized manufacture of product.

.13 Delete information not applicable to project.

.14 Supplement standard information to provide details applicable to project.

.15 If upon review by Consultant, no errors or omissions are discovered or if only minor corrections are made, copies will be returned and fabrication and installation of Work may proceed. If shop drawings are rejected, noted copy will be returned and resubmission of corrected shop drawings, through same procedure indicated above, must be performed before fabrication and installation of Work may proceed.

.16 The review of shop drawings by the Consultant is for sole purpose of ascertaining conformance with general concept.

.1 This review shall not mean that the Consultant approves detail design inherent in shop drawings, responsibility for which shall remain with Contractor submitting same, and such review shall not relieve Contractor of responsibility for errors or omissions in shop drawings or of responsibility for meeting requirements of construction and Contract Documents.

.2 Without restricting generality of foregoing, Contractor is responsible for dimensions to be confirmed and correlated at job site, for information that pertains solely to fabrication processes or to techniques of construction and installation and for co-ordination of Work of sub-trades.

1.5 Interference Drawings

.1 Prepare interference drawings to coordinate the installation of the work of all sections, within available space. Conflicts between trades which could be determined beforehand, by the careful coordination and preparation of interference drawings, shall be corrected at no expense to the Owner.

.2 Prepare interference drawings of all buried services as necessary to avoid conflicts with new or existing structures, foundations or services.

.3 Submit interference and equipment placing drawings as specified in Section 01 71 00, when requested by the Consultant.

1.6 Samples

.1 Submit for review samples as requested in respective specification Sections. Label samples with origin, manufacturer, product information, applicable specification section, and intended use.

.2 Notify Consultant in writing, at time of submission of deviations in samples from requirements of Contract Documents.

.3 Where colour, pattern or texture is criterion, submit full range of manufacturer’s samples.

.4 Adjustments made on samples by Consultant are not intended to change Contract Price. If adjustments affect value of Work, state such in writing to Consultant prior to proceeding with Work.

.5 Make changes in samples which Consultant may require, consistent with Contract Documents.

.6 Reviewed and accepted samples will become standard of workmanship and material against which installed Work will be verified.

1.7 Mock-Ups

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

PART 2 PRODUCTS

2.1 Not Used

.1 Not used

PART 3 EXECUTION

3.1 Not Used

.1 Not used

End of Section

PART 1 GENERAL

1.1 Section Includes

.1 References.
.2 Standards and Definitions.
.3 Designated Substances.
.4 Hazardous Materials.
.5 Potable Water Systems.
.6 Access for Inspection and Testing.
.7 Other Regulatory Requirements.

1.2 References

.1 Perform Work in accordance with the Ontario Building Code Act, O. Reg. 332/12, the Ontario Building Code (OBC) including all Supplements and other codes of provincial or local regulation provided that in case of conflict or discrepancy, more stringent requirements apply.

.2 Where a material is designated in the Contract Documents for a certain application, unless otherwise specified, that material shall conform to standards designated in the Code. Similarly, unless otherwise specified, installation methods and standards of workmanship shall also conform to standards invoked by the aforementioned Code.

.3 Meet or exceed requirements of:
.1 Contract documents.
.2 Specified standards, codes and referenced documents.
.3 Manufacturer’s instructions.

.4 Where requirements of Contract Documents exceed Code requirements provide such additional requirements.

.5 Where the Building Code or the Contract Documents do not provide all information necessary for complete installation of an item, then the manufacturer's instructions for first quality workmanship shall be strictly complied with.

1.3 Standards and Definitions

.1 Where a reference is made to specification standards produced by various organizations, conform to latest edition of standards, as amended and revised to date of Contract.

.2 Have a copy of each specified standard which relates to your work available on the site to be produced immediately on Consultant's request.

1.4 Designated Substances

.1 Known designated substances are identified in the Designated Substance Report.

.2 Stop work immediately when material resembling asbestos, mould or any other designated substance which is not identified in the Designated Substance Report is encountered during the course of the work. Notify Owner and Consultant immediately.

.3 The Owner will arrange for independent testing of suspected designated substances. Removal and disposal of such substances encountered on the site during the course of the work which are not identified in the Designated Substance Report will be undertaken by the Contractor as directed by the independent inspection agency.

1.5 Hazardous Materials

.1 Definition: "Hazardous Material" is material, in any form, which by its nature, may be flammable, explosive, irritating, corrosive, poisonous, or may react violently with other materials, if used, handled or stored improperly. Included are substances prohibited, restricted, designated or otherwise controlled by law.

.2 Hazardous Materials will not be introduced for experimental or any other use prior to being evaluated for hazards.

.3 Make known to the Consultant those hazardous materials or designated substances intended to be used in the workplace and receive permission to use before introducing to the Owner's property.

.4 Provide MSDS for all materials brought to the Place of Work.

.5 Many common construction materials such as asbestos pipe and various insulations are designated substances and shall not be used under any circumstances. Such materials are banned from the Owner's facilities.

1.6 Potable Water Systems

.1 Potable water systems in completed buildings must meet criteria and guidelines established by Provincial and Municipal authorities, prior to occupancy by the Owner.

.2 Upon completion, submit testing certificates verifying water quality and water systems meets all applicable Provincial and Legislated Standards.

1.7 Access for Inspection and Testing

.1 Cooperate fully with and provide assistance to, all outside authorities including Building Inspectors, utilities, testing agencies and consultants, with the inspection of the Work.

1.8 Other Regulatory Requirements

.1 Conform to the requirements of the Ontario Ministry of Transportation, Regional and Local authorities regarding transportation of materials.

.2 Obtain required road occupancy permits.

.3 Pay any required roadway damage deposits required by the local municipality.

.4 Conform to the requirements of the Ontario Ministry of the Environment.

.5 Conform to the requirements of the Ontario Ministry of Labour.

.6 Conform to all applicable local by-laws, regulations and ordinances.

PART 2 PRODUCTS

2.1 Not Used

.1 Not used

PART 3 EXECUTION

3.1 Not Used

.1 Not used

End of Section

PART 1 GENERAL

1.1 Section Includes

.1 Inspection
.2 Independent Inspection Agencies.
.3 Access to Work
.4 Procedures
.5 Rejected Work
.6 Reports
.7 Contractors Responsibilities
.8 Tests and Mix Designs
.9 Mock-Ups
.10 Equipment and Systems.

1.2 Inspection

.1 Contractor is responsible for Quality Control (QC).

.2 Allow Owner and Consultant access to Work. If part of Work is in preparation at locations other than Place of Work, allow access to such Work whenever it is in progress.

.3 Give timely notice requesting inspection if Work is designated for special tests, inspections or approvals by Consultant instructions, or law of Place of Work.

.4 If 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 inspections or tests satisfactorily completed and make good such Work.

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

1.3 Independent Inspection Agencies

.1 Independent Inspection/Testing Agencies will be engaged by Contractor for purpose of inspecting and/or testing portions of Work. Cost of such services will be borne by the Contractor and paid from the cash allowance.

.2 Provide equipment required for executing inspection and testing by appointed agencies.

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

.4 If defects are revealed during inspection and/or testing, appointed agency will request additional inspection and/or testing to ascertain full degree of defect. Correct defect and irregularities as advised by Consultant at no cost to Consultant. Pay costs for retesting and re-inspection.

1.4 Access to Work

.1 Allow inspection/testing agencies access to Work, off site manufacturing and fabrication plants.

.2 Co-operate to provide reasonable facilities for such access.

1.5 Procedures

.1 Notify Owner and Consultant 48 hours in advance of requirement for tests, in order that attendance arrangements can be made.

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

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

1.6 Rejected Work

.1 Remove defective Work, whether result of poor workmanship, use of defective products or damage and whether incorporated in Work or not, which has been rejected by Consultant as failing to conform to Contract Documents. Replace or re-execute in accordance with Contract Documents without impacting the construction schedule..

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

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

1.7 Reports

.1 Submit electronic pdf format inspection and test reports to Consultant.

.2 Provide copies to Subcontractor of work being inspected or tested or manufacturer or fabricator of material being inspected or tested.

1.8 Contractors Responsibilities

.1 Contractor is responsible for the execution of the Construction Quality Plan and is to pay all costs for the execution of the Construction Quality Plan. Designate an experienced site representative for carrying out the Construction Quality Plan.

.2 The Contractor is responsible to provide the Owner with a completed quality product for the Work. Each Contractor shall be responsible for any costs associated with re-testing and reperforming the Work as a result of the Contractor's poor performance or workmanship or other failure to comply with the Contract Documents.

.3 All Work shall be done by persons qualified in their respective trades, and the workmanship shall be first-class in every respect. Each Contractor is responsible for ensuring employees are appropriately trained. All materials and equipment furnished shall be the best of their respective kinds for the intended use and unless otherwise specified, same shall be new and of the latest design.

.4 The Consultant will have the authority to reject Work that does not conform to the Contract Documents or may require special inspection or testing, whether or not such Work is to be then fabricated, installed or completed.

.5 Failure by a Contractor to conduct its operations, means and methods and coordinate proper sequencing of the Work may cause the Owner to withhold payment or any other means deemed necessary to correct non-conforming Work.

.6 The Owner shall engage and pay for without cost to the Contractors a testing firm to perform such engineering laboratory services and on-site inspection as deemed necessary by the Owner, The Consultant will determine compliance with the requirements of the Contract Documents. This Work will not be a service to the Contractors for the performing of tests and checking of materials required of the Contractors.

.7 Copies of test and inspection reports will be furnished to the Contractor. The laboratory and its representatives will be instructed to promptly call to the attention of the Contractor, any instance of non-compliance with the requirements of the Contract Documents. Failure to so notify the Contractor shall not relieve the Contractor of any of its responsibilities for compliance or making good workmanship or materials which are not in compliance with the requirements of the Contract Documents. The agency shall notify the Consultant and the Contractor promptly of irregularities or deficiencies observed in the Work during performance of its services.

.8 Contractor's construction materials, procedures and work shall be subject to specified testing procedures and shall be in conformance with the Contract Documents as verified by Testing Agency.

.9 Cooperate with the testing firm and provide labor to assist with sample preparations where applicable.

.10 Except where specifically indicated to be provided by another entity as identified, inspections, tests, and similar quality control services including those specified to be performed by independent agency are the Contractor’s responsibility, and costs thereof are not to be included in contract sum.

.11 Cooperate with independent agencies performing required inspections, tests, and similar services. Provide auxiliary services as reasonably requested, including access to Work, the taking of samples or assistance with the taking of samples, delivery of samples to test laboratories, and security and protection for samples and test equipment at Project site.

.12 Coordination: Contractor and each engaged independent agency performing inspections, tests, and similar services for project are required to coordinate and sequence activities so as to accommodate required services with minimum delay of Work and without the need of removal/replacement of work to accommodate inspections and tests. Scheduling of times for inspections, tests, taking of samples, and similar activities is Contractor’s responsibility.

.13 Where sampling and testing is required for Sections of Work listed in the Contract Documents, the tests shall be performed by an independent testing lab and paid for by the Contractor.

.14 Test procedures to be used shall be submitted for approval of the Consultant where other than those specified are recommended by the testing agency.

.15 Testing Agency Duties: The independent Testing Agency engaged to perform inspections, sampling and testing of materials and construction specified in individual Specification Sections shall cooperate with the Owner, the Consultant and Contractors in performance of its duties, and shall provide qualified personnel to perform required inspections and tests.

.16 Contractor is responsible for scheduling times for inspections, tests, taking samples and similar activities.

1.9 Tests and Mix Designs

.1 Furnish test results and mix designs as requested.

.2 Cost of tests and mix designs beyond those called for in Contract Documents or beyond those required by law of Place of Work will be appraised by Consultant and may be authorized as recoverable.

1.10 Mock Ups

.1 Prepare mock-ups for Work specifically requested in specifications.

.2 Construct in locations acceptable to Consultant.

.3 Prepare mock-ups for Consultant's review with reasonable promptness and in orderly sequence, to not cause delays in Work.

.4 Failure to prepare mock-ups in ample time is not considered sufficient reason for extension of Contract Time and no claim for extension by reason of such default will be allowed.

.5 Mock-ups may remain as part of Work unless indicated otherwise.

1.11 Equipment and Systems

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

PART 2 PRODUCTS

2.1 Not Used

.1 Not used

PART 3 EXECUTION

3.1 Not Used

.1 Not used

End of Section

PART 1 GENERAL

1.1 Section Includes

.1 Temporary utilities

1.2 Installation and Removal

.1 Provide temporary utilities and controls in order to execute work expeditiously.

.2 Remove from site all such work after use.

1.3 Water Supply

.1 Existing sources of water can be made available to the Contractor at no charge, subject to operational requirements. Arrange for connection and pay all costs for installation, maintenance and removal. Conversions or alterations to existing sources of water to meet construction requirements are the responsibility of the Contractor.

.2 The points of delivery and limits on amount available will be determined on site by the Owner whose written permission must be obtained before any connection is made.

1.4 Temporary Heating and Ventilation

.1 Provide temporary heating and ventilation in enclosed areas as required to:
  .1 Facilitate progress of Work.
  .2 Protect Work and products against dampness and cold.
  .3 Prevent moisture condensation on surfaces.
  .4 Provide ambient temperatures and humidity levels for storage, installation and curing of materials.
  .5 Provide adequate ventilation to meet health regulations for safe working environment.

.2 Maintain temperatures of minimum 10^{o} C in areas where construction is in progress.

.3 Ventilating:
  .1 Prevent accumulations of dust, fumes, mists, vapours or gases in areas occupied during construction.
  .2 Provide local exhaust ventilation to prevent harmful accumulation of hazardous substances into atmosphere of occupied areas.
  .3 Dispose of exhaust materials in manner that will not result in harmful exposure to persons.
  .4 Ventilate storage spaces containing hazardous or volatile materials.
  .5 Ventilate temporary sanitary facilities.
  .6 Continue operation of ventilation and exhaust system for time after cessation of work process to assure removal of harmful contaminants.

.4 Pay costs for maintaining temporary heat, when using permanent heating system. Owner will pay utility charges when temporary heat source is existing building equipment.

.5 Maintain strict supervision of operation of temporary heating and ventilating equipment to:
  .1 Conform to applicable codes and standards.
  .2 Enforce safe practices.
  .3 Prevent abuse of services.
  .4 Prevent damage to finishes.
  .5 Vent direct fired combustion units to outside.

.6 Be responsible for damage to Work due to failure in providing adequate heat and protection during construction.

1.5 Temporary Power and Light

.1 Existing sources of electric power can be made available to the Contractor. Conversions or alterations to existing sources of electric power to meet construction requirements are the responsibility of the Contractor.

.2 The points of delivery and limits on amount available will be determined on site by the Owner whose written permission must be obtained before any connection is made.

.3 Electrical power and lighting systems installed under this Contract may be used for construction requirements only with prior approval of Consultant provided that guarantees are not affected.

.4 All equipment used shall be CSA approved.

.5 Wiring and method of installation shall conform to local power requirements and shall be reviewed by a licensed inspector prior to use.

1.6 Fire Suppression

.1 Obtain written permission from the Consultant to use the fire suppression systems for temporary fire protection services.

.2 Permission may be granted if the conditions for start-up have been met (refer to this Section 210 00 00, Article 1.29 – Manufacturer Certification, and 1.31 – Early Occupancy) and the following conditions are complied with:

.3 The building is fully enclosed.

.4 All equipment and systems subject to freezing are protected.

.5 All systems are maintained and operated properly by the Contractor.

.6 All equipment is lubricated by the Contractor.

.7 Mechanical rooms are kept locked and in broom clean condition.

.8 Guarantees on any equipment or systems are not affected.

.9 Before handing the systems over to the Owners comply with the following conditions:
.1 Bring all fire suppression systems to as-new condition in operation and appearance.

1.7 Temporary Communication Facilities

.1 Provide and pay for temporary telephone, fax, data hook up, lines and equipment necessary for own use.

PART 2 PRODUCTS

2.1 Not Used

.1 Not used

PART 3 EXECUTION

3.1 Not Used

.1 Not used

End of Section

PART 1 GENERAL

1.1 Section Includes

.1 Construction aids.
.2 Site storage.
.3 Parking
.4 Offices
.5 Equipment and Material Storage.
.6 Sanitary facilities.
.7 Signage.
.8 Shoring

1.2 References

.1 Canadian Standards Association (CSA International)
  .1 CAN/CSA Z321-96 (R2006), Signs and Symbols for the Workplace

1.3 Installation and Removal

.1 Provide construction facilities in order to execute work expeditiously.

.2 Remove from site all such work after use.

1.4 Scaffolding

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

1.5 Hoisting

.1 Provide, operate and maintain hoists and cranes required for moving of workers, materials and equipment. Make financial arrangements with Subcontractors for use thereof.

.2 Hoists and cranes shall be operated by qualified operator.

.3 Protect public from Hoisting equipment with secure construction fencing.

.4 Use of hoists for lifting rooftop equipment shall be coordinated with the Town of Whitby. All hoisting during removal of existing equipment and replacement with new equipment shall be done during non-business hours unless agreed with the Town.

1.6 Site Storage/Loading

.1 Do not unreasonably encumber premises with products.

.2 Do not load or permit to load any part of Work with a weight or force that will endanger the Work.

1.7 Construction Parking

.1 Parking will be permitted on site at areas designated by the Owner provided it does not disrupt performance of Work or ongoing Owners operations.

.2 Provide and maintain adequate access to project site.

.3 If authorized to use existing roads for access to project site, maintain such roads for duration of Contract and make good damage resulting from Contractors' use of roads.

1.8 Offices

.1 General Contractor may provide their own office as necessary and subject to site constraints and Owner approval.

1.9 Equipment, Tool and Material Storage

.1 Provide and maintain, in a clean and orderly condition, lockable weatherproof sheds for storage of tools, equipment and materials.

.2 Locate materials not required to be stored in weatherproof sheds on site in a manner to cause least interference with work activities.

1.10 Sanitary Facilities

.1 Provide sanitary facilities for work force in accordance with governing regulations and ordinances.

.2 Post notices and take such precautions as required by local health authorities. Keep area and premises in sanitary condition.

.3 Use of Owner’s facilities is prohibited.

1.11 Construction Signage

.1 Direct requests for approval to erect a Contractor signboard to Owner.

.2 Signs and notices for safety and instruction shall be in English. Graphic symbols shall conform to CAN/CSA Z321-96 (R2006).

.3 Post "Construction Zone" signage outside barrier and entrance to all work areas.

.4 Maintain approved signs and notices in good condition for duration of project, and dispose of off-site on completion of project.

.5 Install signage to direct site traffic and deliveries to the Construction work areas.

1.12 Shoring

.1 Examine the site to determine the conditions under which work will be performed.

.2 Contractor shall formulate his own conclusions as to the extent of the existing conditions and shoring required.

.3 The method of shoring shall be according to the Contractor's and his Engineer's directions.

.4 All existing loads must be shored prior to commencement of demolition and removal of load bearing elements.

.5 All shoring and frame braces must be supplied with a safe load rating which must not be exceeded. Install in accordance with manufacturer's recommended procedures and safety guidelines. Ensure that the safe load conditions of the shoring are not exceeded by dead, live or construction loads.

.6 All shoring shall be subject to the Consultant's review and approval prior to commencing demolition work.

.7 Completely remove all shoring after new structure is installed and all concrete is set.

.8 Submit shoring drawings and a proposed installation procedure stamped by a professional engineer registered in the Province of Ontario. Procedures shall follow the information provided on these drawings. The shoring design engineer shall be retained and paid for by the Contractor. The shoring engineer shall review all existing conditions on site prior to completing shoring design.

.9 Removal of existing materials without proper engineered shoring is a safety hazard and will not be permitted.

.10 Make good all damage to the existing structure and adjoining structures and bear full responsibility for failure to provide adequate shoring.

.11 The failure or refusal of the Consultant to suggest the use of shoring, shall not in any way or to any extent relieve the Contractor of any responsibility concerning the condition of the work or of any of their obligations under the Contract, nor impose any liability on the Owner or their agents; nor shall any delay, whether caused by any action or want of action on the part of the Contractor, or by any act of the Owner, or their agents, or employees, relieve the Contractor from necessity of properly and adequately protecting the existing structure from collapse or damage, nor from and of his obligations under the Contract relating to injury to persons or property, nor entitle him to any claims for extra compensation or an extension in schedule.

PART 2 PRODUCTS

2.1 Not Used

.1 Not used

PART 3 EXECUTION

3.1 Not Used

.1 Not used

End of Section

PART 1 GENERAL

1.1 Section Includes

.1 Barriers.
.2 Environmental Controls.
.3 Traffic Controls.
.4 Fire Routes.

1.2 Installation and Removal

.1 Provide temporary controls in order to execute Work expeditiously.

.2 Remove from site all such work after use.

1.3 Guard Rails and Barricades

.1 Provide secure, rigid guard rails and barricades around deep excavations, open shafts, open stair wells, open edges of floors and roofs.

.2 Provide as required by governing authorities.

1.4 Dust Tight Screens

.1 Provide dust tight screens or partitions to localize dust generating activities, and for protection of workers, finished areas of Work and public.

.2 Maintain and relocate protection until such work is complete.

1.5 Access to Site

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

1.6 Public Traffic Flow

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

1.7 Fire Routes

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

1.8 Protection of Building Finishes

.1 Provide protection for finished and partially finished building finishes and equipment during performance of Work.

.2 Provide necessary screens, covers, and hoardings.

.3 Confirm with Consultant locations and installation schedule 3 days prior to installation.

.4 Be responsible for damage incurred due to lack of or improper protection.

PART 2 PRODUCTS

2.1 Not Used

.1 Not used

PART 3 EXECUTION

3.1 Not Used

.1 Not used

End of Section

PART 1 GENERAL

1.1 Section Includes

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

1.2 Quality

.1 Products, materials, equipment and articles incorporated in Work shall be new, not damaged or defective, and of best quality (compatible with specifications) for purpose intended. If requested, furnish evidence as to type, source and quality of products provided.

.2 Defective products, whenever identified prior to completion of Work, will be rejected, regardless of previous inspections. Inspection does not relieve responsibility, but is precaution against oversight or error. Remove and replace defective products at own expense and be responsible for delays and expenses caused by rejection.

.3 Should any dispute arise as to quality or fitness of products, decision rests strictly with Consultant based upon requirements of Contract Documents.

.4 Unless otherwise indicated in specifications, maintain uniformity of manufacture for any particular or like item throughout building.

.5 Permanent labels, trademarks and nameplates on products are not acceptable in prominent locations, except where required for operating instructions, or when located in mechanical or electrical rooms.

1.3 Availability

.1 Review product delivery requirements and anticipate foreseeable supply delays for any items. If delays in supply of products are foreseeable, notify Consultant of such, in order that substitutions or other remedial action may be authorized in ample time to prevent delay in performance of Work.

.2 In event of failure to notify Consultant at commencement of Work and should it subsequently appear that Work may be delayed for such reason, Consultant reserves right to substitute more readily available products of similar character, at no increase in Contract Price or Contract Time.

1.4 Storage, Handling and Protection

.1 Handle and store products in manner to prevent damage, adulteration, deterioration and soiling and in accordance with manufacturer's instructions when applicable.

.2 Store packaged or bundled products in original and undamaged condition with manufacturer's seal and labels intact. Do not remove from packaging or bundling until required in Work.

.3 Store products subject to damage from weather in weatherproof enclosures.

.4 Store cementitious products clear of earth or concrete floors, and away from walls.

.5 Keep sand, when used for grout or mortar materials, clean and dry. Store sand on wooden platforms and cover with waterproof tarpaulins during inclement weather.

.6 Store sheet materials and lumber on flat, solid supports and keep clear of ground. Slope to shed moisture.

.7 Store and mix paints in heated and ventilated room. Remove oily rags and other combustible debris from site daily. Take every precaution necessary to prevent spontaneous combustion.

.8 Remove and replace damaged products at own expense and to satisfaction of Consultant.

.9 Touch up damaged factory finished surfaces to Consultant's satisfaction. Use touch up materials to match original. Do not paint over name plates.

1.5 Transportation

.1 Pay costs of transportation of products required in performance of Work.

.2 Transportation cost of products supplied by Owner will be paid for by Owner. Contractor shall be responsible for the unloading, handling and storage of such products.

1.6 Manufacturer’s Instructions

.1 Unless otherwise indicated in specifications, install or erect products in accordance with manufacturer's instructions. Do not rely on labels or enclosures provided with products. Obtain written instructions directly from manufacturers.

.2 Notify Consultant in writing, of conflicts between specifications and manufacturer's instructions, so that Consultant may establish course of action.

.3 Improper installation or erection of products, due to failure in complying with these requirements, authorizes Consultant to require removal and re installation at no increase in Contract Price or Contract Time.

1.7 Quality of Work

.1 Ensure Quality of Work is of highest standard, executed by workers experienced and skilled in respective duties for which they are employed.

.2 Immediately notify Consultant if required Work is such as to make it impractical to produce required results.

.3 Do not employ anyone unskilled in their required duties. Consultant reserves right to require dismissal from site, workers deemed incompetent or careless.

.4 Decisions as to standard or fitness of Quality of Work in cases of dispute rest solely with Consultant, whose decision is final.

1.8 Coordination

.1 Ensure cooperation of workers in laying out Work. Maintain efficient and continuous supervision.

.2 Be responsible for coordination and placement of openings, sleeves and accessories.

1.9 Concealment

.1 In finished areas, conceal pipes, ducts and wiring in floors, walls and ceilings, except where indicated otherwise.

.2 Before installation, inform Consultant if there is interference. Install as directed by Consultant.

1.10 Remedial Work

.1 Perform remedial work required to repair or replace parts or portions of Work identified as defective or unacceptable. Coordinate adjacent affected Work as required.

.2 Perform remedial work by specialists familiar with materials affected. Perform in a manner to neither damage nor put at risk any portion of Work.

1.11 Location of Fixtures

.1 Consider location of fixtures, outlets, and mechanical and electrical items indicated as approximate.

.2 Comply with the requirements of the Ontario Building Code and AODA.

.3 Inform Consultant of conflicting installation. Install as directed.

1.12 Fastenings

.1 Provide metal fastenings and accessories in same texture, colour and finish as adjacent materials, unless indicated otherwise.

.2 Prevent electrolytic action between dissimilar metals and materials.

.3 Space anchors within individual load limit or shear capacity and ensure they provide positive permanent anchorage. Wood, or any other organic material plugs are not acceptable.

.4 Keep exposed fastenings to a minimum, space evenly and install neatly.

.5 Fastenings which cause spalling or cracking of material to which anchorage is made are not acceptable.

1.13 Fastenings – Equipment

.1 Use fastenings of standard commercial sizes and patterns with material and finish suitable for service.

.2 Use heavy hexagon heads, semi-finished unless otherwise specified.

.3 Bolts may not project more than one diameter beyond nuts.

.4 Use plain type washers on equipment, sheet metal and soft gasket lock type washers where vibrations occur. Use resilient washers with stainless steel.

1.14 Protection of Work in Progress

.1 Adequately protect Work completed or in progress. Work damaged or defaced due to failure in providing such protection is to be removed and replaced, or repaired, as directed by Consultant, at no increase in Contract Price or Contract Time.

.2 Prevent overloading of any part of building. Do not cut, drill or sleeve any load bearing structural member, unless specifically indicated without written approval of Consultant.

1.15 Existing Utilities

.1 When breaking into or connecting to existing services or utilities, execute Work at times directed by local governing authorities, with minimum of disturbance to Work, and/or building occupants and pedestrian and vehicular traffic.

.2 Protect, relocate or maintain existing active services. When services are encountered, cap off in manner approved by authority having jurisdiction. Stake and record location of capped service.

PART 2 PRODUCTS

2.1 Not Used

.1 Not used

PART 3 EXECUTION

3.1 Not Used

.1 Not used

End of Section

PART 1 GENERAL

1.1 Section Includes

.1 Safety Requirements
.2 Fire Protection
.3 Accident Reporting
.4 Records on Site

1.2 References

.1 Federal regulations, latest edition including all amendments up to project date:
  .1 Fire Commissioners of Canada, FC 301, Standard for Construction Operations.
  .2 Canada Labour Code, Part 2, Canada Occupational Safety and Health Regulations.
.2 Provincial regulations, latest edition including all amendments up to project date:
  .1 Ontario Building Code.
  .2 Occupational Health and Safety Act.
.3 National Fire Protection Agency (NFPA)
  .1 NFPA 241 Standard for Safeguarding Construction, Alteration, and Demolition Operations, 2013 Edition

1.3 Submittals

.1 Make submittals in accordance with Section 01 33 00 – Submittal Procedures.

.2 Submit to Owner and Consultant copies of the following documents, including updates issued:
  .1 Notice of Project filed with Provincial Ministry of Labour or equivalent for Place of Work
  .2 Site-specific Health and Safety Plan prior to commencement of work on the work site. Plan shall include but not be limited to the following:
    .1 Name and contact info of Contractor's Health and Safety Representative for Work Site; including twenty-four (24) hour emergency contact phone numbers.
    .2 Phone numbers of local fire, police, and ambulance outside of 911 services.
    .3 Location of nearest medical facility and level of injury that each can service.
  .3 Submit to the Owner, Consultant and Municipal Fire Department, for review, a “Fire Safety Plan” conforming to Section 2.14 of the National Fire Code of Canada. Maintain a copy of the “Fire Safety Plan” on site.
  .4 Copies of certification for all employees on site of applicable safety training including, but not limited to:
    .1 WHIMIS.
    .2 Fall arrest and protection.
    .3 Suspended Access Equipment.
    .4 Erection of Scaffolding.
    .5 License for powder actuated devices.
  .5 Material Safety Data Sheets (MSDS) of controlled products to be used.
  .6 On-site Contingency and Emergency Response Plan addressing:
    .1 Standard procedures to be implemented during emergency situations.
    .2 Preventative planning and protocols to address possible emergency situations.

.3 Guidelines for handling, storing, and disposing of hazardous materials that maybe encountered on site, including measures to prevent damage or injury in case of an accidental spill.

.4 Incident and accident reports, promptly if and upon occurrence
  .1 Reports or directions issued by authorities having jurisdiction, immediately upon issuance from that authority.

.2 Accident or Incident Reports, within 24 hours of occurrence.

.5 Submit other data, information and documentation upon request by the Consultant as stipulated elsewhere in this section.

1.4 Compliance Requirements

.1 Comply with the latest edition of the Ontario Occupational Health and Safety Act, and the Regulations made pursuant to the Act.

1.5 Constructor

.1 The Contractor will be the “Constructor” as defined by the Occupational Health and Safety Act, will file a Notice of Project with the Ontario Ministry of Labour prior to commencement of the work and will pay all associated fees.

.2 The “Constructor” will be solely responsible for the safety of all persons on the Site.

1.6 Safety Requirements

.1 Observe and enforce all construction safety measures and comply with the latest edition and amending regulations of the following documents and in the event of any differences among those provisions, the most stringent shall apply:
- .1 Occupational Health and Safety Act and Regulations for Construction Projects, August 1997, Ontario Regulation 213/91 including amendments.
- .2 Hazardous Products Act and Canada Labour Code.
- .3 The Workplace Safety and Insurance Board, O-Reg 454.
- .4 Ontario Building Code Act, Ontario Regulation 332/12 including amendments.
- .5 National Building Code of Canada, Part 8: Safety Measures on Construction and Demolition Sites.
- .6 National Fire Code of Canada.
- .7 NFPA 241 Standard for Safeguarding Construction, Alteration, and Demolition Operations, 2013 Edition
- .8 Environmental Protection Act.
- .9 The Power Commission Act.
- .10 The Boiler and Pressure Vessels Act.
- .11 The Elevators and Lifts Act.
- .12 The Operating Engineer's Act.
- .13 Municipal statutes.

.2 Obey all Federal, Provincial and Municipal Laws, Acts, Statutes, Regulations, Ordinances and By-laws which could in any way, pertain to the work outlined in the Contract, or to any employees of the Contractor. Satisfy all statutory requirements imposed by the Occupational Health and Safety Act and Regulations made thereunder, on a Contractor, and Constructor and/or Employer with respect to or arising out of the performance of the Contractors obligations under this Contract.

.3 Working at Heights: The supervisor of the project, will be responsible to ensure that his employees and subcontractors/suppliers have current Working at Heights and Fall Protection certification.

.4 Confined Space: Where applicable, provide the Consultant and all Regulatory Authorities with a copy of the Contractors’ Confined Space Entry Procedure. In the event that defined procedures are not available, abide by the applicable requirements of the Occupational Health and Safety Act and all regulations made thereunder.

.5 The supervisor of the project, will be responsible for his employees and subcontractors/suppliers maintaining standard safety practices, as well as the specific safety rules listed below, while working on the Owner's property.

.6 The Owner reserves the right to order individuals to leave the site if the individual is in violation of any safety requirement or any Act, and any expense incurred will be the responsibility of the Contractor.

.7 Notify the Owner should any hazardous condition become apparent.

.8 Enforce the use of CSA approved hard hats and safety boots and any other Personal Protective Equipment (PPE) specific to the work activity for all persons entering or working at the construction site. Refuse admission to those refusing to conform to this requirement.

.9 Provide safeguard and protection against accident, injury or damage to any person on the site, adjacent work areas and adjacent property.

1.7 Safety Meetings

.1 Site toolbox safety meetings will be held weekly for all Contractor employees and all sub trade contractors.

.2 Where a Joint Health and Safety Committee(s) is required on a project, workers and supervisors selected as members of the committee must attend.

1.8 Workplace Hazardous Materials Information System (WHMIS)

.1 Contractor to be familiar with WHIMIS regulations and be responsible for compliance.

.2 Contractor is responsible for all other requirements of regulations as applicable to Employers.

.3 All controlled products to be properly labelled and stored.

.4 Immediately inform Owner and Consultant if any unforeseen or peculiar safety-related factor, hazard, or condition becomes evident during performance of Work.

1.9 Fire Protection

.1 Provide and maintain safeguard and protection against fire in accordance with current fire codes and regulations.

.2 Provide temporary fire protection throughout the course of construction. Particular attention shall be paid to the elimination of fire hazards.

.3 Comply with the requirements of FCC No. 301 Standards for Construction Operations issued by the Fire Commissioner of Canada and the National Building Code.

.4 Provide and maintain portable fire extinguishers during construction, in accordance with Part 6 of the National Fire Code of Canada 2015 and NFPA 241 Standard for Safeguarding Construction, Alteration, and Demolition Operations, 2013 Edition

.5 Maintain unobstructed access for firefighting at all areas in accordance with the National Building Code of Canada.

1.10 Accident Reporting

.1 Investigate and report incidents and accidents as required by Occupational Safety and Health Act, and the Regulations made pursuant to the Act.

1.11 Records on Site

.1 Maintain on site a copy of the safety documentation as specified in this section and any other safety related reports and documents issued to or received from the authorities having jurisdiction.

.2 Upon request, make copies available to the Consultant.

PART 2 PRODUCTS

2.1 Not Used

.1 Not used

PART 3 EXECUTION

3.1 Not Used

.1 Not used

End of Section

PART 1 GENERAL

1.1 Section Includes

.1 Field Engineering services.

1.2 Survey Reference Points

.1 Locate, confirm and protect control points prior to starting work. Preserve permanent reference points during construction.

1.3 Survey Requirements

.1 Establish lines and levels, locate and lay out, by instrumentation.

.2 Establish pipe invert elevations.

.3 Establish lines and levels for mechanical and electrical work.

1.4 Existing Services

.1 Before commencing work, establish location and extent of service lines in area of Work and notify Consultant of findings. The Contractor is responsible for coordination of all utility locates.

.2 Where Work involves breaking into or connecting to existing services, carry out work at times directed by authorities having jurisdiction, with minimum of disturbance to building occupants, pedestrian and vehicular traffic.

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

.4 Install temporary drain plugs to prevent construction debris from blocking pipes downstream of the work.

1.5 Location of Services, Equipment and Fixtures

.1 Location of services, equipment, fixtures and outlets indicated on drawings or specified are to be considered as approximate.

.2 Locate equipment, fixtures and distribution systems to provide minimum interference and maximum usable space and in accordance with manufacturer's recommendations for safety, access and maintenance. Include existing equipment which affects, or will be affected by the work.

.3 Inform Consultant of impending installation and obtain approval for actual location.

.4 Location of existing services where required, is approximate and is based on information provided by the Owner. Undertake all locates to determine exact locations of existing services, and lay out new services to avoid any conflicts with new building elements, including site improvements, building foundations and other new or existing services.

.5 Submit field drawings and interference drawings to indicate relative position of various services and equipment. Refer to requirements for interference drawings specified elsewhere.

.6 Prepare interference and equipment placing drawings to ensure that all components will be properly accommodated within the spaces provided.

.7 Prepare drawings to indicate coordination and methods of installation of a system with other systems where their relationship is critical. Ensure that all details of equipment apparatus and connections are coordinated.

.8 Ensure that clearances required by jurisdictional authorities and clearances for proper maintenance and access are indicated and maintained.

1.6 Records

.1 Maintain a complete, accurate log of control and survey work as it progresses.

.2 Record locations of maintained, re-routed and abandoned service lines.

.3 All existing concrete floor slabs shall be scanned prior to any cutting or breaking of concrete. Employ a qualified concrete scanning company or inspection and testing agency to scan and map floor slabs for reinforcing, plastic and metal conduit, piping, grounding cables, embedments and the like. Map all slabs and provide copies to the owner and Consultant.

1.7 Submittals

.1 Make submittals in accordance with Section 01 33 00 – Submittal Procedures.

.2 Submit two (2) copies of interference drawings to Owner and Consultant

.3 On request of Consultant, submit documentation to verify accuracy of field engineering work.

PART 2 PRODUCTS

2.1 Not Used

.1 Not used

PART 3 EXECUTION

3.1 Not Used

.1 Not used

End of Section

PART 1 GENERAL

1.1 Section Includes

.1 Requirements and limitations for cutting and patching the Work.

1.2 Submittals

.1 Make submittals in accordance with Section 01 33 00 – Submittal Procedures.

.2 Submit written request and obtain Consultant's approval in advance of cutting or alteration which affects:
.1 Structural integrity of any element of Project.
.2 Integrity of weather exposed or moisture resistant elements.
.3 Efficiency, maintenance, or safety of any operational element.
.4 Visual qualities of sight exposed elements

1.3 Materials

.1 Required for original installation.

.2 Change in Materials: Submit request for substitution in accordance with Section 01 33 00 - Submittal Procedures.

.3 Requests for change in materials shall include documentation indicating conformance to project requirements and intent.

1.4 Definitions

.1 Cutting: Removal of in-place construction necessary to permit installation or performance of other work.

.2 Patching: Fitting and repair work required to restore construction to original conditions after installation of other work.

1.5 Preparation

.1 Inspect existing conditions, including elements subject to damage or movement during cutting and patching.

.2 After uncovering, inspect conditions affecting performance of Work.

.3 Beginning of cutting or patching means acceptance of existing conditions.

.4 Provide supports to assure structural integrity of surroundings; provide devices and methods to protect other portions of project from damage.

.5 Provide protection from elements for areas which may be exposed by uncovering work; maintain excavations free of water.

1.6 Execution

.1 Execute cutting, fitting, and patching including excavation and fill, to complete Work.

.2 Uncover Work to install ill-timed Work.

.3 Remove and replace defective and non-conforming Work.

.4 Provide cutting and patching of all openings in non-structural elements of Work as necessary to complete installation of mechanical and electrical Work. Include complete removal and replacement of such elements as necessary to provide construction access.

.5 Fit several parts together, to integrate with other Work

.6 Execute Work by methods to avoid damage to other Work, and which will provide proper surfaces to receive patching and finishing.

.7 Employ original installer to perform cutting and patching for weather-exposed and moisture-resistant elements, and sight-exposed surfaces.

.8 Cut rigid materials using masonry saw or core drill. Pneumatic or impact tools are not allowed on masonry work without prior approval.

.9 Restore work with new products.

.10 Fit work airtight to pipes, sleeves, ducts, conduit, and other penetrations through surfaces.

.11 At penetration of fire rated wall, ceiling, or floor construction, completely seal voids with “ULC approved firestopping material, full thickness of the construction element. Include any openings in existing building elements created by removal of existing services or equipment.

.12 Refinish surfaces to match adjacent finishes: Refinish continuous surfaces to nearest intersection. Refinish assemblies by refinishing entire unit.

PART 2 PRODUCTS

2.1 Materials

.1 General: Comply with requirements specified in other Sections.

.2 In-Place Materials: Use materials for patching identical to in-place materials. For exposed surfaces, use materials that visually match in-place adjacent surfaces to the fullest extent possible.

.3 If identical materials are unavailable or cannot be used, use materials that, when installed, will provide a match acceptable to Consultant for the visual and functional performance of in-place materials.

PART 3 EXECUTION

3.1 Cutting and Patching

.1 General: Employ skilled workers to perform cutting and patching. Proceed with cutting and patching at the earliest feasible time, and complete without delay.

.2 Cut in-place construction to provide for installation of other components or performance of other construction, and subsequently patch as required to restore surfaces to their original condition.

.3 Existing Warranties: Remove, replace, patch, and repair materials and surfaces cut or damaged during installation or cutting and patching operations, by methods and with materials so as not to void existing warranties.

.4 Temporary Support: Provide temporary support of work to be cut.

.5 Protection: Protect in-place construction during cutting and patching to prevent damage. Provide protection from adverse weather conditions for portions of Project that might be exposed during cutting and patching operations.

.6 Adjacent Occupied Areas: Where interference with use of adjoining areas or interruption of free passage to adjoining areas is unavoidable, coordinate cutting and patching according to requirements in Section 01 10 00 - Summary of Work.

.7 Existing Utility Services and Mechanical/Electrical Systems: Where existing services/systems are required to be removed, relocated, or abandoned, bypass such services/systems before cutting to minimize interruption to occupied areas.

.8 Cutting: Cut in-place construction by sawing, drilling, breaking, chipping, grinding, and similar operations, including excavation, using methods least likely to damage elements retained or adjoining construction. If possible, review proposed procedures with original Installer; comply with original Installer's written recommendations.
   .1 In general, use hand or small power tools designed for sawing and grinding, not hammering and chopping. Cut holes and slots neatly to minimum size required, and with minimum disturbance of adjacent surfaces. Temporarily cover openings when not in use.
   .2 Finished Surfaces: Cut or drill from the exposed or finished side into concealed surfaces.
   .3 Concrete and Masonry: Cut using a cutting machine, such as an abrasive saw or a diamond-core drill.
   .4 Excavating and Backfilling: Comply with requirements in applicable Sections where required by cutting and patching operations.
   .5 Mechanical and Electrical Services: Cut off pipe or conduit in walls or partitions to be removed. Cap, valve, or plug and seal remaining portion of pipe or conduit to prevent entrance of moisture or other foreign matter after cutting.
   .6 Proceed with patching after construction operations requiring cutting are complete.

.9 Patching: Patch construction by filling, repairing, refinishing, closing up, and similar operations following performance of other work. Patch with durable seams that are as invisible as practicable. Provide materials and comply with installation requirements specified in other Sections, where applicable.
   .1 Inspection: Where feasible, test and inspect patched areas after completion to demonstrate physical integrity of installation.
   .2 Exposed Finishes: Restore exposed finishes of patched areas and extend finish restoration into retained adjoining construction in a manner that will minimize evidence of patching and refinishing.
      .1 Clean piping, conduit, and similar features before applying paint or other finishing materials.
      .2 Restore damaged pipe covering to its original condition.
   .3 Floors and Walls: Where walls or partitions that are removed extend one finished area into another, patch and repair floor and wall surfaces in the new space. Provide an even surface of uniform finish, color, texture, and appearance. Remove in-place floor and wall coverings and replace with new materials, if necessary, to achieve uniform color and appearance.
      .1 Where patching occurs in a painted surface, prepare substrate and apply primer and intermediate paint coats appropriate for substrate over the patch, and apply final paint coat over entire unbroken surface containing the patch. Provide additional coats until patch blends with adjacent surfaces.
   .4 Ceilings: Patch, repair, or rehang in-place ceilings as necessary to provide an even-plane surface of uniform appearance.

.10 Cleaning: Clean areas and spaces where cutting and patching are performed. Remove paint, mortar, oils, putty, and similar materials from adjacent finished surfaces.

End of Section

PART 1 GENERAL

1.1 Section Includes

.1 Progressive Cleaning
.2 Final Cleaning

1.2 Project Cleanliness

.1 Maintain Work in tidy condition, free from accumulation of waste products and debris.

.2 Remove waste materials from site at daily regularly scheduled times or dispose of as directed by the Owner. Disposal times and bin locations shall be approved by the Owner. Do not burn waste materials on site.

.3 Clear snow and ice from access to building, bank/pile snow in designated areas only.

.4 Make arrangements with and obtain permits from authorities having jurisdiction for disposal of waste and debris.

.5 Provide on-site containers for collection of waste materials and debris.

.6 Provide and use clearly marked separate bins for recycling.

.7 Remove debris daily. The work site must be left clean and tidy upon completion, to the satisfaction of the Consultant.

.8 Clean interior areas prior to start of finishing work, and maintain areas free of dust and other contaminants during finishing operations.

.9 Store volatile waste in covered metal containers, and remove from premises at end of each working day.

.10 Provide adequate ventilation during use of volatile or noxious substances. Use of building ventilation systems is not permitted for this purpose.

.11 Schedule cleaning operations so that resulting dust, debris and other contaminants will not fall on wet, newly painted surfaces nor contaminate building systems.

PART 2 PRODUCTS

2.1 Products

.1 All cleaning materials and products shall be low VOC type. Submit list of cleaning products including MSDS for approval prior to commencement of cleaning operations.

.2 Use only cleaning materials recommended by manufacturer of surface to be cleaned, and recommended by cleaning material manufacturer.

PART 3 EXECUTION

3.1 Final Cleaning

.1 When Work is Substantially Performed remove surplus products, tools, construction machinery and equipment not required for performance of remaining Work.

.2 Remove waste products and debris other than that caused by others, and leave Work clean and suitable for occupancy.

.3 Prior to final review remove surplus products, tools, construction machinery and equipment.

.4 Clean and polish glass, mirrors, hardware, wall tile, stainless steel, chrome, porcelain enamel, baked enamel, plastic laminate, and mechanical and electrical fixtures. Replace broken, scratched or disfigured glass.

.5 Remove stains, spots, marks and dirt from decorative work, electrical and mechanical fixtures, furniture fitments, walls, floors and ceilings.

.6 Clean lighting reflectors, lenses, and other lighting surfaces.

.7 Vacuum clean and dust building interiors, behind grilles, louvres and screens.

.8 Wax, seal, shampoo or prepare floor finishes, as recommended by manufacturer.

.9 Inspect finishes, fitments and equipment and ensure specified workmanship and operation.

.10 Clean equipment and fixtures to a sanitary condition; clean or replace filters of mechanical equipment.

.11 Remove debris and surplus materials from accessible concealed spaces.

.12 Conduct a final cleaning inspection with the Owner following the cleaning work to ensure the level of cleanliness meets the Town of Whitby expectations.

End of Section

PART 1 GENERAL

1.1 Section Includes

.1 Construction waste management and disposal.

1.2 References

.1 O. Reg. 102/94, Waste Audits and Waste Reduction Work Plans.

1.3 Submittals

.1 Make submittals in accordance with Section 01 33 00 – Submittal Procedures.

.2 Submit 2 copies of completed Waste Management Plan (WMP) including Waste Reduction Workplan (WRW) and Materials Source Separation Program description prior to project start-up.

1.4 Definitions

.1 Waste Management Plan (WMP): Contractor's approved overall strategy for waste management including waste audit, waste reduction workplan and materials source separation program.

.2 Waste Audit (WA): Relates to projected waste generation. Involves measuring and estimating quantity and composition of waste, reasons for waste generation, and operational factors which contribute to waste.

.3 Waste Reduction Work Plan (WRW): Written report which addresses opportunities for reduction, reuse, or recycling of materials. WRW is based on information acquired from WA.

.4 Materials Source Separation Program (MSSP): Consists of a series of ongoing activities to separate reusable and recyclable waste material into material categories from other types of waste at point of generation.

.5 Waste Management Coordinator (WMC): Designate individual who is in attendance on-site, full-time. Designate, or have designated, individuals from each Subcontractor to be responsible for waste management related to their trade and for coordinating activities with WMC.

.6 Separate Condition: Refers to waste sorted into individual types.

1.5 Waste Management Goals for the Project

.1 The Owner has established that this Project shall generate the least amount of waste possible and that processes shall be employed that ensure the generation of as little waste as possible including prevention of damage due to mishandling, improper storage, contamination, inadequate protection or other factors as well as minimizing over packaging and poor quantity estimating.

.2 Of the inevitable waste that is generated, the waste materials designated in this specification shall be salvaged for reuse and or recycling. Waste disposal in landfills or incinerators shall be minimized. On new construction projects this means careful recycling of job site waste.

1.6 Documents

.1 Maintain at job site, one copy of following documents:
- .1 Waste Audit
- .2 Waste Reduction Workplan
- .3 Material Source Separation Plan

1.7 Waste Management Plan

.1 Waste Management Plan: Within 10 calendar days after receipt of Notice of Award of Contract, or prior to any waste removal, whichever occurs sooner, submit to the Owner and Consultant a Waste Management Plan. The Plan shall contain the following:
- .1 Analysis of the proposed job site waste to be generated, including the types of recyclable and waste materials generated (by volume or weight). In the case of demolition, a list of each item proposed to be salvaged during the course of the project should also be prepared
- .2 Alternatives to Land Filling: Contractor shall designate responsibility for preparing a list of each material proposed to be salvaged, reused, or recycled during the course of the Project.

.2 Post WMP or summary where workers at site are able to review its content.

1.8 Waste Audit

.1 Prepare Waste Audit prior to project start-up.

.2 Record, on Waste Audit, extent to which materials or products used consist of recycled or reused materials or products

1.9 Waste Reduction Work Plan

.1 Prepare WRW prior to project start-up.

.2 Reduce construction and demolition waste in compliance with O. Reg. 102/94.

.3 Reduction will involve action to minimize quantity of waste at source. Reuse products which would become waste where practical. Recycling will involve collection and source separation at the site, of materials for use as feedstock in manufacturing of new products.

.4 Conform to local Municipal and Regional Landfill Solid waste management requirements. Consider reduction, reuse and recycling of waste generated during construction such as dimensional lumber, clean drywall, concrete, brick, scrap metal and corrugated cardboard.

1.10 Materials Source Separation Program

.1 The Waste Management Plan shall include a Source Separation Program for recyclable waste, and shall be in accordance with the established policies currently in place at the local Municipality, and the requirements of O. Reg. 102/94.

.2 Prepare MSSP and have ready for use prior to project start-up.

.3 Implement MSSP for waste generated on project in compliance with approved methods and as approved by Consultant.

.4 Provide on-site facilities for collection, handling, and storage of anticipated quantities of reusable and/or recyclable materials.

.5 Provide containers to deposit reusable and/or recyclable materials.

.6 Locate containers to facilitate deposit of materials without hindering daily operations.

.7 Locate separated materials in areas which minimize material damage.

.8 Collect, handle, store on-site, and transport off-site, salvaged materials in separate condition.

1.11 Disposal of Wastes

.1 Make arrangements with and obtain permits from authorities having jurisdiction for disposal of waste and debris.

.2 Provide appropriate on-site containers for collection of waste materials and debris.

.3 Provide and use clearly marked separate bins for recycling.

.4 Remove waste materials from site at regularly scheduled times or dispose of as directed by Consultant. Do not burn waste materials on site.

.5 Remove waste material and debris from site and deposit in waste container at end of each working day.

.6 Do not permit waste to accumulate onsite.

.7 Burying of rubbish and waste materials is prohibited.

.8 Disposal of waste into waterways, storm, or sanitary sewers is prohibited.

1.12 Scheduling

.1 Coordinate work with other activities at site to ensure timely and orderly progress of the Work.

1.13 Storage, Handling and Protection

.1 Store, materials to be reused, recycled and salvaged in locations as directed by Owner.

.2 Materials from building demolition to be salvaged or re-used are to be removed and salvaged.

.3 Unless specified otherwise, materials for removal become Contractor's property.

PART 2 PRODUCTS

2.1 Not Used

.1 Not used

PART 3 EXECUTION

3.1 Application

.1 Do work in compliance with Waste Management Plan.

.2 Handle waste materials not reused, salvaged, or recycled in accordance with appropriate regulations and codes.

.3 Source separate materials to be reused/recycled into specified sort areas.

3.2 Diversion of Materials

.1 Separate materials from general waste stream and stockpile in separate piles or containers, to approval of Owner, and consistent with applicable fire regulations. Mark containers or stockpile areas. Provide instruction on disposal practices.

.2 On-site sale of materials is not permitted.

End of Section

.

PART 1 GENERAL

1.1 Section Includes

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

1.2 References

.1 Canadian Construction Documents Committee CCDC 2-2020, Stipulated Price Contract including Supplementary Conditions.
.2 OAA/OGCA Document 100 - Recommended procedures regarding Substantial Performance of Construction Contracts and Completion Takeover of Projects.
.3 The Construction Lien Act.

1.3 Inspection and Declaration

.1 Contractor's Inspection: The Contractor shall conduct an inspection of Work, identify deficiencies and defects, and repair as required to conform to Contract Documents. Submit duplicate copies of the deficiency list to the Owner and Consultant.
  .1 Notify Consultant in writing of satisfactory completion of Contractor's Inspection and that corrections have been made.
  .2 Request Consultant's review.

.2 Consultant's Review: Consultant and Contractor will perform review of Work to identify obvious defects or deficiencies. Contractor shall correct Work accordingly.

.3 Completion: submit written certificate that following have been performed:
  .1 Work has been completed and inspected for compliance with Contract Documents.
  .2 Defects have been corrected and deficiencies have been completed.
  .3 Equipment and systems have been tested, adjusted and balanced and are fully operational.
  .4 Certificates required by Boiler Inspection Branch, Fire Commissioner, Utility companies, Electrical safety Authority, TSSA and other regulatory agencies have been submitted.
  .5 Operation of systems have been demonstrated to Owner's personnel.
  .6 Work is complete and ready for Final Review by the Owner and Consultant.

.4 Final Inspection: when items noted above are completed, request final review of Work by Consultant, and Contractor. If Work is deemed incomplete by the Consultant, complete outstanding items and request re-review.

.5 Declaration of Substantial Performance: when Consultant consider deficiencies and defects have been corrected and it appears requirements of Contract have been substantially performed, make application for certificate of Substantial Performance. Refer to CCDC 2, General Conditions Article GC 5.4 - Substantial Performance of Work and the Construction Lien Act for specifics to application.

.6 Commencement of Lien and Warranty Periods: date of Owner's acceptance of submitted declaration of Substantial Performance shall be date for commencement for warranty period and commencement of lien period unless required otherwise by lien statute of Place of Work.

.7 Final Payment: When Consultant considers final deficiencies and defects have been corrected and it appears requirements of Contract have been totally performed, make application for final payment. Refer to CCDC 2, General Conditions Article GC 5.7 for specifics to application.

.8 Payment of Holdback: After issuance of certificate of Substantial Performance of Work, submit an application for payment of holdback amount in accordance with CCDC 2, General Conditions Article 5.5

PART 2 PRODUCTS

2.1 Not Used

.1 Not used

PART 3 EXECUTION

3.1 Not Used

.1 Not used

End of Section

.

PART 1 GENERAL

1.1 Section Includes

.1 As built, samples, and specifications.
.2 Equipment and systems.
.3 Product data, materials and finishes, and related information.
.4 Operation and maintenance data.
.5 Spare parts, special tools and maintenance materials.
.6 Warranties and bonds.

1.2 Submittals

.1 Make submittals in accordance with Section 01 33 00 – Submittal Procedures.

1.3 Submission

.1 Prepare instructions and data using personnel experienced in maintenance and operation of described products.

.2 At least 2 weeks prior to commencement of scheduled commissioning activities, submit 2 copies of the DRAFT Operating and Maintenance Manuals, for Consultants review and use during the commissioning activities. After the completion of the commissioning activities, the Consultant will return to the Contractor 1 DRAFT copy, with review comments, for revision. Submit 1 copy of the revised Operating and Maintenance for approval prior to the production of FINAL copies. Prior to the Issuance of the Final Certificate of Completion, and within 10 working days after Substantial Performance, submit 2 printed copies and one digital (.pdf) copy of the FINAL Operating and Maintenance Manuals.

.3 Building will not be deemed ready for use unless the draft copies of the Operating and Maintenance Manuals and the "As-built" Record Documents have been submitted and reviewed by the Consultant.

.4 Building will not be deemed ready for use unless the completed and submitted Operating and Maintenance Manuals and "As-built" Record Documents have been accepted by the Consultant.

.5 Ensure spare parts, maintenance materials and special tools provided are new, undamaged or defective, and of same quality and manufacture as products provided in Work.

.6 If requested, furnish evidence as to type, source and quality of products provided.

.7 Defective products will be rejected, regardless of previous inspections. Replace products at own expense.

.8 Pay costs of transportation.

1.4 Format

.1 Organize data in the form as instructional manual.

.2 Binders: vinyl, hard covered, 3 'D' ring, loose leaf 219 x 279 mm with spine and face pockets.

.3 When multiple binders are used correlate data into related consistent groupings. Identify contents of each binder on spine.

.4 Cover: identify each binder with type or printed title 'Project Record Documents'; list title of project and identify subject matter of contents.

.5 Arrange content by Section numbers and sequence of Table of Contents.

.6 Provide tabbed fly leaf for each separate product and system, with typed description of product and major component parts of equipment.

.7 Text: manufacturer's printed data, or typewritten data.

.8 Drawings: provide with reinforced punched binder tab. Bind in with text; fold larger drawings to size of text pages.

.9 Provide 1:1 scaled CAD files in .dwg format on CD.

1.5 Contents Each Volume

.1 Table of Contents: provide title of project;
- .1 Date of submission; names.
- .2 Addresses, and telephone numbers of Consultant and Contractor with name of responsible parties.
- .3 Schedule of products and systems, indexed to content of volume.

.2 .For each product or system:
- .1 List names, addresses and telephone numbers of subcontractors and suppliers, including local source of supplies and replacement parts.

.3 Product Data: mark each sheet to identify specific products and component parts, and data applicable to installation; delete inapplicable information.

.4 Drawings: supplement product data to illustrate relations of component parts of equipment and systems, to show control and flow diagrams.

.5 Typewritten Text: as required to supplement product data. Provide logical sequence of instructions for each procedure, incorporating manufacturer's instructions specified in Section 01 45 00 - Quality Control

1.6 Occupant Manual

.1 Submit Occupant Manual to Consultant’s requirements.

.2 Occupant Manual to include:
- .1 General building information.
- .2 Building management.
- .3 Building operations.
- .4 Safety.
- .5 Security.
- .6 Environmental considerations.
- .7 Communications.
- .8 Contact List.
- .9 Other/Miscellaneous.

1.7 As Builts and Samples

.1 In addition to requirements in General Conditions, maintain at the site for Consultant one record copy of:
- .1 Contract Drawings.
- .2 Specifications.
- .3 Addenda.
- .4 Change Orders and other modifications to Contract.
- .5 Reviewed shop drawings, product data, and samples.
- .6 Field test records.
- .7 Inspection certificates.
- .8 Manufacturer's certificates.

.2 Store record documents and samples in field office apart from documents used for construction. Provide files, racks, and secure storage.

.3 Label record documents and file in accordance with Section number listings in List of Contents of this Project Manual. Label each document "PROJECT RECORD" in neat, large, printed letters.

.4 Maintain record documents in clean, dry and legible condition. Do not use record documents for construction purposes.

.5 Keep record documents and samples available for inspection by Consultant.

1.8 Recording Actual Site Conditions

.1 Record information on set of drawings, provided by Consultant.

.2 Record information concurrently with construction progress. Do not conceal Work until required information is recorded.

.3 Contract Drawings and shop drawings: mark each item to record actual construction, including:
- .1 Measured horizontal and vertical locations of underground utilities and appurtenances, referenced to permanent surface improvements.
- .2 Measured locations of internal utilities and appurtenances, referenced to visible and accessible features of construction.
- .3 Field changes of dimension and detail.
- .4 Changes made by change orders.
- .5 Details not on original Contract Drawings.
- .6 References to related shop drawings and modifications.

.4 Submit following drawings:
- .1 Record changes in red. Mark on one set of prints and at completion of project prior to final inspection, produce electronic “as-built” records on disk using latest version of AutoCad. Annotate “AS-BUILT RECORD” in each drawing title block.

.2 All changes shall be shown on a separate drawing layer named "as-built".

.3 At least 2 weeks prior to commencement of scheduled commissioning activities, submit one copy of the DRAFT “As-built” Project Record Documents for Consultants review and use during the commissioning activities. After the completion of the commissioning activities, the Consultant will return to the Contractor the DRAFT copy, with review comments, for revision. Prior to the Issuance of the Final Certificate of Completion, and within 10 working days after Substantial Performance, submit 2 copies of the FINAL “As-built” Project Record Documents and disk of “as-built” record drawings.

.5 Specifications: legibly mark each item to record actual construction, including:
.1 Manufacturer, trade name, and catalogue number of each product actually installed, particularly optional items and substitute items.
.2 Changes made by Addenda and change orders.

.6 Other Documents: maintain manufacturer's certifications, inspection certifications, field test records, required by individual specifications sections

1.9 Equipment and Systems

.1 Each Item of Equipment and Each System: include description of unit or system, and component parts. Give function, normal operation characteristics, and limiting conditions. Include performance curves, with Engineering data and tests, and complete nomenclature and commercial number of replaceable parts.

.2 Panel board circuit directories: provide electrical service characteristics, controls, and communications.

.3 Include installed colour coded wiring diagrams.

.4 Operating Procedures: include start-up, break-in, and routine normal operating instructions and sequences. Include regulation, control, stopping, shut-down, and emergency instructions. Include summer, winter, and any special operating instructions.

.5 Maintenance Requirements: include routine procedures and guide for trouble-shooting; disassembly, repair, and reassembly instructions; and alignment, adjusting, balancing, and checking instructions.

.6 Provide servicing and lubrication schedule, and list of lubricants required.

.7 Include manufacturer's printed operation and maintenance instructions.

.8 Include sequence of operation by controls manufacturer.

.9 Provide original manufacturer's parts list, illustrations, assembly drawings, and diagrams required for maintenance.

.10 Provide installed control diagrams by controls manufacturer.

.11 Provide Contractor’s co-ordination drawings, with installed colour coded piping diagrams.

.12 Provide charts of valve tag numbers, with location and function of each valve, keyed to flow and control diagrams.

.13 Provide list of original manufacturer's spare parts, current prices, and recommended quantities to be maintained in storage.

.14 Include test and balancing reports as specified in Section 01 45 00 - Quality Control

.15 Additional requirements: as specified in individual specification sections.

1.10 Materials and Finishes

.1 Building Products, Applied Materials, and Finishes: include product data, with catalogue number, size, composition, and colour and texture designations.

.2 Instructions for cleaning agents and methods, precautions against detrimental agents and methods, and recommended schedule for cleaning and maintenance.

.3 Moisture-Protection and Weather-Exposed Products: include manufacturer's recommendations for cleaning agents and methods, precautions against detrimental agents and methods, and recommended schedule for cleaning and maintenance.

.4 Additional Requirements: as specified in individual specifications sections.

1.11 Spare Parts

.1 Provide spare parts, in quantities specified in individual specification sections.

.2 Provide items of same manufacture and quality as items in Work.

.3 Spare parts as identified in individual sections are to be delivered to the Owner prior to the Contractor’s application for Substantial Performance.

.4 Receive and catalogue items. Submit inventory listing to Consultant. Include approved listings in Maintenance Manual.

.5 Obtain receipt for delivered products and submit prior to final payment.

1.12 Maintenance Materials

.1 Provide maintenance and extra materials, in quantities specified in individual specification sections.

.2 Provide items of same manufacture and quality as items in Work.

.3 Maintenance materials are to be delivered to the Owner prior to the Contractor’s application for Substantial Performance.

.4 Receive and catalogue items. Submit inventory listing to Consultant. Include approved listings in Maintenance Manual.

.5 Obtain receipt for delivered products and submit prior to final payment.

1.13 Special Tools

.1 Provide special tools, in quantities specified in individual specification section.

.2 Provide items with tags identifying their associated function and equipment.

.3 Special tools are to be delivered to the Owner prior to the application for Substantial Performance.

.4 Receive and catalogue items. Submit inventory listing to Consultant. Include approved listings in Maintenance Manual.

1.14 Storage, Handling and Protection

.1 Store spare parts, maintenance materials, and special tools in manner to prevent damage or deterioration.

.2 Store in original and undamaged condition with manufacturer's seal and labels intact.

.3 Store components subject to damage from weather in weatherproof enclosures.

.4 Store paints and freezable materials in a heated and ventilated room.

.5 Remove and replace damaged products at own expense and to satisfaction of Consultant.

1.15 Warranties and Guarantees

.1 Separate each warranty or guarantee with index tab sheets keyed to Table of Contents listing.

.2 List subcontractor, supplier, and manufacturer, with name, address, and telephone number of responsible principal.

.3 Obtain warranties and guarantees, executed in duplicate by subcontractors, suppliers, and manufacturers, within ten days after completion of the applicable item of work.

.4 Except for items put into use with Owner's permission, leave date of beginning of time of warranty until the Date of Substantial Performance is determined.

.5 Verify that documents are in proper form, contain full information, and are notarized.

.6 Co-execute submittals when required.

.7 Retain warranties and guarantees until time specified for submittal.

1.16 Independent Specialty Engineers Sign-Off

.1 Prior to Substantial Performance, provide copies of signed and stamped engineers review and sign-off letters stating that the work has been built in accordance with their drawings and designs. Conditional or vague letters of sign-off will not be accepted. All specialty design engineers for all sub-contractors and suppliers will be required to review the work in progress at appropriate intervals to ensure compliance with their designs and drawings and shall provide final sign-off letters. Provide copies of all field reports issued by specialty engineers. Carry all costs associated with full compliance with this requirement.

PART 2 PRODUCTS

2.1 Not Used

.1 Not used

PART 3 EXECUTION

3.1 Not Used

.1 Not used

End of Section

PART 1 GENERAL

1.1 General

.1 Conform to the requirements of Division 1.

1.2 References

.1 CSA Group (CSA)
  .1 CSA S350-M1980 (R2003), Code of Practice for Safety in Demolition of Structures
.2 Department of Justice Canada (Jus):
  .1 Canadian Environmental Assessment Act (CEAA), 2012
  .2 Canadian Environmental Protection Act (CEPA), 2012
    .1 SOR/2003-2, On-Road Vehicle and Engine Emission Regulations.
    .2 SOR/2006-268, Regulations Amending the On-Road Vehicle and Engine Emission Regulations
    .3 Transportation of Dangerous Goods Act (TDGA), 1992, c. 34
    .4 Motor Vehicle Safety Act (MVSA), 1995
    .5 Hazardous Materials Information Review Act, 1985
.3 National Fire Protection Association (NFPA):
  .1 NFPA 241 - 96, Standard for Safeguarding Construction, Alteration, and Demolition Operations
.4 Designated Substance Survey

1.3 Submittals

.1 Make submittals in accordance with Section 01 33 00 – Submittal Procedures.

.2 Schedule of Demolition Activities: Coordinate with Section 01 32 00 - Construction Progress Documentation.

1.4 Definitions

.1 Demolition: rapid destruction of building following removal of hazardous materials.

.2 Hazardous Materials: dangerous substances, dangerous goods, hazardous commodities and hazardous products, may include but not limited to: asbestos PCB's, CFC's, HCFC's poisons, corrosive agents, flammable substances, ammunition, explosives, radioactive substances, or other material that can endanger human health or wellbeing or environment if handled improperly.

.3 Waste Management Coordinator (WMC): Contractor representative responsible for supervising waste management activities as well as coordinating related, required submittal and reporting requirements.

.4 Construction Waste Management Plan (CWM Plan): Written plan addressing opportunities for reduction, reuse, or recycling of materials prepared in accordance with Section 01 74 19 - Construction Waste Management and Disposal.

.5 Construction Waste Management Report (CWM Report): Written report identifying actual materials that formed CWM Plan for reduction, reuse, or recycling of materials prepared in accordance with Section 01 74 19 - Construction Waste Management and Disposal.

1.5 Administrative Requirements

.1 Coordination: Coordinate with Owner for the material ownership including but not limited to:
.1 Except for items or materials indicated to be reused, salvaged, reinstalled, or otherwise indicated to remain Owner's property, demolished materials shall become Contractor's property and shall be removed from Project site.

.2 Pre-Demolition Meetings:
.1 Convene pre-installation meeting 1 week prior to beginning work of this Section with Owner and Consultant in accordance with Section 01 31 00 - Project Management and Coordination.

.3 Scheduling:
.1 Employ necessary means to meet project time lines without compromising specified minimum rates of material diversion.
.2 In event of unforeseen delay notify Consultant in writing.

1.6 Quality Assurance

.1 Regulatory Requirements: Ensure Work is performed in compliance with CEPA, CEAA, TDGA, and applicable Provincial and Municipal regulations.

.2 Comply with hauling and disposal regulations of authority having jurisdiction.

.3 Standards: Comply with ANSI A10.6 and NFPA 241

1.7 Site Conditions

.1 Review Designated Substance Survey and take precautions to protect environment.

.2 If material resembling spray or trowel-applied asbestos or other designated substance be encountered which has not been identified in the DESS report, stop work, take preventative measures, and notify Consultant immediately.
.1 Proceed only after receipt of written instructions have been received from Consultant.

.3 Notify Owner before disrupting building access or services.

.4 All existing concrete floor slabs shall be scanned prior to any cutting or breaking of concrete. Employ a qualified concrete scanning company or inspection and testing agency to scan and map floor slabs for reinforcing, plastic and metal conduit, piping, grounding cables, embedments and the like. Map all slabs and provide copies to the owner and Consultant.

1.8 Existing Conditions

.1 Refer to Designated Substance Survey – Limited Designated Substance Survey Report

PART 2 PRODUCTS

2.1 Equipment

.1 Equipment and heavy machinery:
.1 On-road vehicles to: CEPA-SOR/2003-2, On-Road Vehicle and Engine Emission Regulations and CEPA-SOR/2006-268, Regulations Amending the On-Road Vehicle and Engine Emission Regulations.

.2 Machinery running only while in use, except where extreme temperatures prohibit shutting machinery down.

PART 3 EXECUTION

3.1 Examination

.1 Survey existing conditions and correlate with requirements indicated to determine extent of demolition required.

.2 Review Project Record Documents of existing construction provided by Owner.

.3 Owner does not guaranty that existing conditions are the same as those indicated in Project Record Documents.

.4 Inventory and record the condition of items being removed and salvaged.

.5 When unanticipated mechanical, electrical, or structural elements are encountered, investigate and measure the nature and extent of the element.

.6 Promptly submit a written report to Consultant.

.7 Perform an engineering survey of condition of building to determine whether removing any element might result in structural deficiency or unplanned collapse of any portion of structure or adjacent structures during demolition operations.

.8 Verify that hazardous materials have been remediated before proceeding with demolition operations.

3.2 Preparation

.1 Protection of In-Place Conditions:
- .1 Prevent movement, settlement, or damage to adjacent structures, utilities, and parts of building to remain in place. Provide bracing and shoring required.
- .2 Keep noise, dust, and inconvenience to occupants to minimum.
- .3 Protect building systems, services and equipment.
- .4 Provide temporary dust screens, covers, railings, supports and other protection as required.
- .5 Do Work in accordance with Section 01 70 03 - Safety Requirements.

.2 Demolition/Removal:
- .1 Demolish parts of structure as indicated.
- .2 Remove parts of existing building to permit new construction.
- .3 Trim edges of partially demolished building elements to tolerances as defined by Consultant to suit future use.
- .4 At end of each day's work, leave Work in safe and stable condition.
- .5 Protect interiors of parts not to be demolished from exterior elements at all times.
- .6 Demolish to minimize dusting. Keep materials wetted as directed by Consultant.
- .7 Only dispose of material specified by selected alternative disposal option for own use.

.3 Prior to commencement of demolition work, coordinate with Owner to determine materials and equipment which will be retained by the Owner. Remove such materials and equipment and store in location designated by Owner:

3.3 Restoration and Repairs

.1 General: Promptly repair damage to adjacent construction caused by demolition operations.

.2 Where repairs to existing surfaces are required, patch to produce surfaces suitable for new materials.

.3 Restore exposed finishes of patched areas and extend restoration into adjoining construction in a manner that eliminates evidence of patching and refinishing.

3.4 Cleaning

.1 Proceed in accordance with Section 01 74 11 – Cleaning.

.2 Leave Work area clean at end of each day.

.3 Waste Management: separate waste materials for reuse and recycling in accordance with Section 01 74 19 - Construction Waste Management and Disposal. Remove recycling containers and bins from site and dispose of materials at appropriate facility.

End of Section

PART 1 GENERAL

1.1 General

.1 Conform to the requirements of Division 1.

1.2 Related Sections

.1	Section 04 22 00	Concrete Unit Masonry
.2	Section 05 50 00	Metal Fabrications

1.3 References

.1 CSA Group (CSA)
  .1 CAN/CSA-A371-04 (R2014) Masonry Construction for Buildings.
  .2 CSA-S304.1-04 Masonry Design for Buildings (Limit States Design)
  .3 CSA G30.3-M1983 (R1998) Cold-Drawn Steel Wire for Concrete Reinforcement.
  .4 CSA G30.18-09 (R2014) Carbon Steel Bars for Concrete Reinforcement
  .5 CSA W186-M1990 (R2016) Welding of Reinforcing Bars in Reinforced Concrete Construction
  .6 CSA A23.1-14/A23.2-14 Concrete Materials and Methods of Concrete Construction / Test Methods and Standard Practices for Concrete
.2 American Concrete Institute (ACI)
  .1 Detailing Manual
.3 Reinforcing Steel Institute of Canada (RSIC)
  .1 Reinforcing Steel Manual of Standard Practice

1.4 Submittals

.1 Make submittals in accordance with Section 01 33 00 – Submittal Procedures.

.2 Product Data: Submit manufacturer's printed product literature, specifications and data sheets.

.3 Shop Drawings:
  .1 Submit shop drawings for all masonry reinforcing. Include placing drawings, bar lists and details. Indicate clearly reinforcing bar sizes, spacing, bending details, lap details, dowels to adjacent construction location and quantities of reinforcement and connectors.
  .2 Prepare placing drawings and bar lists in accordance with the American Concrete Institute (ACI) Detailing Manual, and the Reinforcing Steel Institute of Canada (RSIC) Reinforcing Steel Manual of Standard Practice, the typical details included with Contract Documents.
  .3 Prepare placing drawings to minimum scale of 1:50.
  .4 Submit placing drawings and bar lists sufficiently detailed and dimensioned to permit correct placement of reinforcement and accessories without reference to architectural or structural Drawings.
  .5 Show reinforcement, including dowels, in elevation on placing drawings for wall reinforcement.
  .6 Show cover to reinforcement
  .7 Show location of construction joints.

1.5 Shipping, Handling and Storage

.1 Refer to Section 01 61 00 – Common Product Requirements.

.2 Deliver, handle and store materials in accordance with manufacturer’s printed instructions.

1.6 Waste Management and Disposal

.1 Refer to Section 01 74 19 – Construction Waste Management and Disposal.

PART 2 PRODUCTS

2.1 Materials

.1 All metal components: hot dipped zinc galvanized to CSA-S304 unless otherwise indicated.

.2 Bar Reinforcement: To CSA-A371 and CSA G30.18, grade 400R, deformed billet steel bars.

.3 Wire Reinforcement: To CSA-A371 and CSA G30.3.
- .1 Interior walls: hot dipped galvanized to CSA-S304
  - .1 4.76 mm wire diameter hot dipped galvanized to CSA-S304 for interior bearing walls.
  - .2 3.66 mm wire diameter bright wire finish, standard duty for interior non-bearing walls and partitions.
  - .3 Truss Type: Blok-Trus BL-30 by Blok-Lok Ltd. for non-vertically reinforced walls
  - .4 Ladder Type: Blok-Trus BL-10 by Blok-Lok Ltd. for vertically reinforced walls.

.4 Masonry Ties: to CSA A370 Ferro Prescriptive Corrugated Strip Tie, 22 mm wide x 100 mm long, 0.91 mm thick, corrugated hot dip galvanized steel.

.5 Equivalent products as manufactured by the following manufacturer's may be used subject to submission and acceptance by the Consultant of technical data:
- .1 Dayton Superior Dur-O-Wall
- .2 Hohmann and Barnard Inc.

.6 Accessories: Supply all necessary anchors and fasteners as recommended by manufacturer.

2.2 Fabrication

.1 Fabricate reinforcing in accordance with CSA-A23.1 and Reinforcing Steel Manual of Standard Practice by the Reinforcing Steel Institute of Ontario.

.2 Obtain Consultant's approval for locations of reinforcement splices other than shown on placing drawings.

.3 Upon approval of Consultant, weld reinforcement in accordance with CSA W186.

.4 Ship reinforcement clearly identified in accordance with drawings.

PART 3 EXECUTION

3.1 Installation

.1 Install masonry anchors in accordance with CSA-A370, CSA-A371, CSA-A23.1 and CSA3-S304 unless indicated otherwise.

3.2 Reinforcement

.1 Unless otherwise noted, all masonry walls shall be reinforced with joint reinforcement.

.2 Reinforcement shall be installed in the first and second bed joints, 200 mm apart immediately above lintels and below sill at openings, and in bed joints at 400 mm vertical intervals elsewhere. Reinforcement in the second bed joint above or below openings shall extend two feet beyond the jambs. All other reinforcement shall be continuous except that it shall not pass through vertical masonry control joints. Side rods shall be lapped at least 150 mm at splices.

.3 Use prefabricated corner and tee sections for continuous reinforcement at corners and intersecting walls.

.4 Vertical reinforcement shall have a minimum clearance of 13 mm from the masonry and not less than one bar diameter between bars.

.5 All block cores containing vertical reinforcing and/or anchor bolts shall be solidly filled with non-shrink grout.

.6 Place reinforcement and ties in grout spaces prior to grouting.

.7 Cleanouts: Provide cleanouts in the bottom course of masonry for each grout pour when the grout pour height exceeds 1.5 m.

.8 Construct cleanouts so that the space to be grouted can be cleaned and inspected. In solid grouted masonry, space cleanouts horizontally a maximum of 800 mm on center.

.9 Construct cleanouts with an opening of sufficient size to permit removal of debris. The minimum opening dimension shall be 76 mm.

.10 After cleaning, close cleanouts with closures braced to resist grout pressure.

3.3 Reinforced Lintels and Bond Beams

.1 Reinforce masonry lintels and bond beams as indicated.

.2 Place and grout reinforcement in accordance with CSA-S304.

3.4 Metal Anchors

.1 Do metal anchors as indicated.

3.5 Lateral Support and Anchorage

.1 Do lateral support and anchorage in accordance with CSA-S304 and as indicated.

3.6 Control Joints

.1 Terminate reinforcement 25 mm short of each side of control joints unless otherwise indicated.

.2 Control joints shall be stepped to avoid cutting lintel beams. Under no circumstance shall the control joints be placed to compromise the bearing for the lintel.

3.7 Field Bending

.1 Do not field bend reinforcement and connectors except where indicated or authorized by Consultant. When field bending is authorized, bend without heat, applying a slow and steady pressure.

.2 Replace bars and connectors which develop cracks or splits.

3.8 Field Touch Up

.1 Touch up damaged and cut ends of galvanized reinforcement steel and connectors with compatible finish to provide continuous coating.

3.9 Cleaning

.1 Proceed in accordance with Section 01 74 11 – Cleaning.

End of Section

PART 1 GENERAL

1.1 General

.1 Conform to the requirements of Division 1.

1.2 Related Sections

.1	Section 03 20 00	Concrete Reinforcing
.2	Section 03 30 00	Cast-in-Place Concrete
.3	Section 04 05 19	Masonry Anchorage and Reinforcing
.4	Section 05 50 00	Metal Fabrications
.5	Section 06 10 00	Rough Carpentry
.6	Section 07 84 00	Firestopping
.7	Section 07 92 00	Joint Sealants
.8	Section 08 11 00	Metal Doors and Frames

1.3 References

.1 Canadian Concrete Masonry Producers Association (CCMPA) Quality Assurance Program.

.2 ASTM International, (ASTM)
- .1 ASTM C90-15 Standard Specification for Loadbearing Concrete Masonry Units
- .2 ASTM C129-14a Standard Specification for Nonloadbearing Concrete Masonry Units
- .3 ASTM C150/C150M-15 Standard Specification for Portland Cement
- .4 ASTM C207-06 (2011) Standard Specification for Hydrated Lime for Masonry Purposes.
- .5 ASTM D2240-05(2010) Standard Test Method for Rubber Property—Durometer Hardness.
- .6 ASTM D5249-10 Standard Specification for Backer Material for Use with Cold and Hot Applied Joint Sealants in Portland Cement Concrete and Asphalt Joints.

.3 CSA Group (CSA)
- .1 CSA A23.1-14 Concrete Materials and Methods of Concrete Construction
- .2 CAN/CSA A165 Series-04 (R2009), CSA Standards on Concrete Masonry Units.
- .3 CAN/CSA A179-04 (R2009), Mortar and Grout for Unit Masonry,
- .4 CAN3-A370-04 (2009) Connectors for Masonry.
- .5 CAN/CSA A371-04 (R2009), Masonry Construction for Buildings.
- .6 CSA S304.1-04 (R2010), Masonry Design for Buildings.

1.4 Submittals

.1 Make submittals in accordance with Section 01 33 00 – Submittal Procedures.

.2 Data: Submit manufacturer's printed product literature, specifications and data sheets

1.5 Quality Assurance

.1 The masonry sub-contractor shall have a minimum of five (5) years of continuous documented Canadian experience in work of the type and quality shown and specified. Proof of experience shall be submitted when requested by the Consultant and shall be subject to the approval of the Consultant.

.2 Pre-installation meeting: conduct pre-installation meeting to verify project requirements manufacturer's instructions and manufacturer's warranty requirements.

1.6 Shipping, Handling and Storage

.1 Refer to Section 01 61 00 – Common Product Requirements.

.2 Deliver, handle and store materials in accordance with manufacturer's printed instructions.

.3 Materials shall be kept clean and dry.

.4 Deliver cement, lime and mortar ingredients with manufacturer's seal and labels intact.

.5 Cementitious material and aggregates shall be stored in accordance with the requirements of CAN A23.1-09.

.6 Exposed units which become stained or chipped, surface marked or scratched, and materials which are affected by inadequate protection shall be replaced, at no additional expense to the Consultant.

.7 Masonry units shall be delivered to site in protective film and shall be stored without contact with ground or ground water.

1.7 Cold Weather Requirements

.1 Provide heat enclosures and heat as required.

.2 Work to be undertaken shall be carried out according to CAN3-A371, Clause 5.15.2.

.3 Maintain temperature of mortar between 5°C and 50°C until batch is used.

1.8 Hot Weather Requirements

.1 Protect freshly laid masonry from drying too rapidly by means of waterproof, non-staining coverings.

1.9 Protection

.1 Protect masonry and other work from marking and other damage. Protect completed work from mortar droppings. Use non-staining coverings.

1.10 Waste Management and Disposal

.1 Refer to Section 01 74 19 – Construction Waste Management and Disposal.

PART 2 PRODUCTS

2.1 Materials

.1 Masonry Units: Concrete Block: Modular, conforming to CCMPA requirements and CAN/CSA A165.1.
  .1 H/15/A/M concrete, masonry units, at all locations unless noted otherwise.
  .2 Refer to drawings for Fire Resistance Ratings. Type of concrete and block to conform to Table 5.0, Fire Resistance Rating of Concrete Block in Hours, of the Canadian Concrete Masonry Producers Association Handbook.

.3 Special shapes: provide special shapes indicated or required including bullnose and corner blocks, base blocks, fillers, and the like as may be required. Provide purpose made shapes for lintels and bond beams.
.4 Exposed block shall all be made by one manufacturer and shall be uniform in colour, shade and texture.

.2 Architectural Concrete Block: H/20/A/M, metric modular size as manufactured by Shouldice, Permacon, Boehmers (Hargest), Richvale York Block Inc., Day & Campbell Ltd., or Blue Circle Materials.
.1 Type: Full Split Face, 190 x 390 x thickness indicated.
.1 Colour: Permacon Nordic Grey

.3 All architectural concrete block shall be supplied with manufacturer's standard pre-manufactured corners and shapes

.4 Masonry Reinforcement: Bar Reinforcement, wire reinforcement and ties: as specified in Section 04 05 19 - Masonry Anchorage and Reinforcing.

.5 Control Joint Filler: to ASTM D5249-10, Type 1, Round, flexible, continuous-length, nonabsorbent, nongassing, nonstaining, and nonshrinking. Extruded from a cross-linked polyethylene. Flexibile foam, heat-Resistant Backer Rod. 9.5 mm thick by width of wall.

.6 Pre-manufactured Masonry Control Joint: Pre-manufactured polyvinylchloride control joints may be used in lieu of the specified built-up type of joint.

.7 Mortar and Grout: Conforming to CAN/CSA A179-04 (R2009).
.1 Use same brand of material and source of aggregate for entire project.
.2 Aggregate: CAN/CSA A179-04 (R2009), fine grain aggregates.
.3 Cement: normal Portland to ASTM C150/C150M-12, Type 10.
.4 Water shall be clean, potable and free of deleterious amounts of acid, alkalies, or organic materials.
.5 Hydrated Lime: Type 'S' to ASTM C207-06 (2011).
.6 Type 'S' mortar shall be used for all concrete block masonry work.
.7 Proprietary Mortar Mixes: conform to mix requirements specified
.8 Mortar colour for concrete unit masonry work shall be grey.
.9 Admixtures of any kind are not allowed.

.8 Grout: to CAN/CSA A179-04 (R2009), Table 3:
.1 Premixed, non-shrink non-metallic grout.

.9 Other Materials: all other materials not specifically described but required for a complete and proper installation of masonry, shall be as selected by the Contractor subject to approval by the Consultant

2.2 Mixes

.1 Mixing: Prepare and mix mortar materials under strict supervision, and in small batches only for immediate use.

.2 Mix proprietary mortars in strict accordance with manufacturer's instructions to produce the specified mortar types in accordance with CAN/CSA A179-04 (R2009). Do not use re-tempered mortars.

.3 Take representative samples for testing consistency of strength and colour according to CAN/CSA A179-04 (R2009).

2.3 Accessories

.1 Mechanical Fasteners: As recommended by manufacturer of material to be fastened, and in accordance with the reference standards, corrosion resistant.

PART 3 EXECUTION

3.1 Existing Conditions

.1 Examine work of other trades for defects or discrepancies and report same in writing to Consultant.

.2 Installation of any part of this work shall constitute acceptance of such surfaces as being satisfactory.

3.2 General

.1 Do masonry work in accordance with CAN/CSA A371except where specified otherwise.

.2 A competent masonry foreman shall supervise and direct the work and only skilled masons shall execute the work of this Section.

.3 Coordinate work of this Section with others such as, field welding of anchors to steel work, insulation application, and the like. Prepare all items for built-in as the work proceeds, either supplied and installed by other trades or installed under this Section.

.4 Unless otherwise indicated on the drawings, all interior masonry partitions shall extend from floor level to the underside of floor or roof structures above.

3.3 Workmanship

.1 Build masonry plumb, level, and true to line, with vertical joints in alignment.

.2 Concrete block units:
Bond: running bond.
Coursing height: 200 mm for one block and one joint.
Jointing: concave where exposed or where paint or other finish coating is specified.

.3 Architectural concrete unit masonry:
.1 Bond: stack.
.2 Coursing height: 200 mm for one block and one joint.
.3 Jointing: concave where exposed or where paint or finish coating is specified.

.4 Lay out coursing and bond to achieve correct coursing heights, and continuity of bond above and below openings, with minimum of cutting.

.5 Lay block with webs to align plumb over each other with thick ends of webs up. The top course of all partitions which do not pass through a ceiling or up to the underside of a roof deck shall have the open cells filled solid.

.6 Cut exposed block with power driven abrasive cutting disc or diamond cutting wheel for flush mounted electrical outlets, grilles, pipes, conduits, leaving 3 mm maximum clearance.

.7 Fill all vertical and bed joints, including plain end faces, through the entire wall thickness solidly with mortar.

.8 Do not break bond of exposed walls where partitions intersect and if bond would show through on exposed face of walls. Bond these partitions to walls they intersect with prefabricated intersection masonry reinforcement in each course.

.9 Bond intersecting block walls in alternate courses.

.10 Terminate non load bearing walls within 20 mm of structure above unless indicated otherwise.

.11 Where walls are pierced by structural members, ducts, pipes, fill voids with mortar to within 20 mm of such members.

.12 Buttering corners of units, throwing mortar droppings into joints, deep or excessive furrowing of bed joints, is not permitted. Do not shift or tap units after mortar has taken initial set. Where adjustment must be made after mortar has started to set, remove mortar and replace with fresh supply.

.13 Do not wet concrete masonry before or during laying in wall.

.14 Bed and vertical joints shall be evenly and solidly filled with mortar.

.15 Provide reinforced bond beams where indicated on structural drawings.

.16 Provide vertical reinforcement as indicated on structural drawings.

3.4 Exposed Masonry

.1 Do not use chipped, cracked or stained, and otherwise damaged units or unsatisfactory material in exposed and load bearing masonry walls.

.2 Lay all joints 10 mm thick (uniform). All joints shall be full of mortar except where specifically designated to be left open.

.3 All joints shall be slightly concave. Use sufficient force to press mortar tight against masonry units on both sides of joints. Remove excess material or burrs left after jointing by means of a trowel or rubbing with burlap bag.

.4 Provide preformed bullnose block at all exposed masonry corners. Grinding of block on site will not be permitted.

3.5 Tolerances

.1 Tolerances in notes to Clause 5.3 of CAN/CSA A371-04 (R2009) apply.

3.6 Reinforcement

.1 Refer to Section 04 05 19 - Masonry Anchorage and Reinforcing.

3.7 Connectors

.1 Refer to Section 04 05 19 - Masonry Anchorage and Reinforcing.

3.8 Concrete Masonry Lintels

.1 Refer to Section 04 05 19 - Masonry Anchorage and Reinforcing.

.2 Lintels in non-load-bearing walls shall be constructed with special bond or lintel block units unless shown otherwise on plans. Lintels shall bear 200 mm minimum and bearing shall be isolated with two layers of heavy asphalt coated paper.

.3 Reinforcing steel in lintels shall be 2 x 20 M bars minimum specified under Section 04 05 19 - Masonry Anchorage and Reinforcing, or as noted on drawings.

.4 Concrete fill for lintels shall be 25 MPa or as noted on the drawings. Concrete shall be as specified in Section 03 30 00.

3.9 Loose Steel Lintels

.1 Install loose steel lintels. Centre over opening width.

.2 Lintels supplied under Section 05 50 00 – Metal Fabrications.

3.10 Control Joints

.1 Provide continuous joints as indicted and at spacing not to exceed 6000 mm c/c unless noted otherwise on drawings.

.2 Break vertical mortar bond with extruded neoprene gasket or building paper.

.3 Prime control joint to prevent drying out of caulking material.

3.11 Support of Loads

.1 Use 25 MPa concrete unless specified otherwise on the Drawings, where concrete fill is used in lieu of solid units.

.2 Use grout to CAN/CSA A179-04 (R2009) where grout is used in lieu of solid units.

.3 Install building paper below voids to be filled with grout. Keep paper 25 mm back from face of units.

3.12 Lateral Support and Anchorage

.1 Do lateral support and anchorage of masonry in accordance with CSA S304.1-04 (R2010) and as indicated.

3.13 Grouting

.1 Grout masonry in accordance with CSA S304.1-04 (R2010) and as indicated.

3.14 Temporary Wall Bracing

.1 Design and provide all required temporary engineered wall bracing.

.2 Brace masonry walls to resist wind pressure and other lateral loads during construction period.

.3 Provide temporary bracing of masonry work during and after erection until mortar has cured and permanent lateral support is in place.

3.15 Built-ins

.1 Build in items required to be built into masonry and provided by other Sections, including bearing plates, door frames, anchor bolts, sleeves and inserts. Build in items to present a neat, rigid, true and plumb installation. Leave wall openings required for ducts, grilles, pipes and other items.

.2 Prevent displacement of built-in items during construction. Check plumb, location and alignment frequently, as work progresses.

.3 Brace door jambs to maintain plumb. Fill voids between masonry and metal frames with masonry mortar or insulation, as indicated on drawings or as required to provide a neat finished appearance.

.4 Set wall plates on masonry in non-shrink grout in accordance with manufacturer's instructions.

.5 Do all cutting, fitting, drilling, patching and making good for other trades in masonry work.

3.16 Protection

.1 Protect masonry units from damage resulting from subsequent construction operations.

.2 Use protection materials and methods which will not stain or damage masonry units.

.3 Remove protection materials upon Substantial Performance, or when risk of damage is no longer present.

3.17 Cleaning

.1 Proceed in accordance with Section 01 74 11 – Cleaning.

.2 Allow mortar droppings on unglazed concrete masonry to partially dry then remove by means of trowel, followed by rubbing lightly with small piece of block and finally by brushing.

.3 Remove mortar from concrete floor slabs and leave entire area vacuum clean.

End of Section

PART 1 GENERAL

1.1 General

.1 Conform to the requirements of Division 1.

1.2 Related Sections

.1 Section 05 12 23 Structural Steel
.2 Section 05 31 00 Steel Deck
.3 Section 09 21 16 Gypsum Board

1.3 References

.1 The National Building Code of Canada.
.2 ASTM International (ASTM)
  .1 ASTM A591/A591M - 89 Standard Specification for Steel Sheet, Electrolytic Zinc Coated, for Light Coating Mass Applications
  .2 ASTM A653/A653M-13 Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process
  .3 ASTM A792/A792M-10 Standard Specification for Steel Sheet, 55 % Aluminum-Zinc Alloy-Coated by the Hot-Dip Process
.3 American National Standards Institute (ANSI)
  .1 ANSI/AWSD1.3, Structural Welding Code-Sheet Steel.
.4 CSA Group (CSA)
  .1 CAN/CSA G164-M Hot Dip Galvanizing of Irregularly Shaped Articles.
  .2 CAN/CSA-S16.1-M Limit States Design of Steel Structures.
  .3 CSA S136-12 Cold Formed Steel Structural Members.
  .4 CSA W47.1 Certification of Companies for Fusion Welding of Steel Structures.
  .5 CSA W59 Welded Steel Construction (Metal-Arc Welding).
  .6 CSA W178.1 Certification of Welding Inspection Organizations
  .7 CSA W178.2 Certification of Welding Inspectors
.5 Canadian General Services Board (CGSB)
  .1 CGSB 1-GP-181M Standard for Coating, Zinc Rich, Organic Ready Mix.
.6 Canadian Sheet Steel Building Institute (CSSBI)
  .1 CSSBI 51-06. Lightweight Steel Framing Design Manual.
  .2 CSSBI S6-90 Guide Specification for Lightweight Steel Framing.

1.4 Submittals

.1 Make submittals in accordance with Section 01 33 00 – Submittal Procedures.

.2 Submit shop drawings indicating layout and details of fabrication and erection. Indicate member sizes and gauges of materials, framing, method of fastenings, spacing of all members, bridging and bracing. Indicate design loads.

.3 Indicate all framing systems including exterior and interior framing and soffits.

.4 Lightweight steel framing systems shall be designed by, and each shop drawing shall bear the stamp of a registered Professional Engineer licensed to practice in the Province of Ontario. Each submission of the shop drawings shall bear the seal of the Engineer.

.5 Submit engineering design calculations or data verifying the capacity of the members and the ability of the assemblies to meet the design requirements.

.6 Detail welded connections using standards symbols for welded joints as published in current CISC Handbook of Steel Construction.

.7 Submit field review reports specified in Section 3.7 within 3 working days of each inspection. Reports shall be submitted directly from the Design Engineer to the Consultant.

.8 Submit mill test reports covering chemical and mechanical properties of steel, and coating designation.

.9 Inspection Reports: Inspection and Testing company shall:
- .1 Submit reports at least weekly when the work of this Section is in progress.
- .2 Distribute inspection reports as follows:
  - .1 General Contractor.
  - .2 Consultant.
  - .3 Owner.
  - .4 Lightweight Steel Framing fabricator.
- .3 Sign report by inspector who performs inspection, describing progress of work, deficiencies observed and corrective action taken.
- .4 Include deficiency list of outstanding items from previous reports, and comment on status.

1.5 Qualifications

.1 Subcontractor undertaking work of this Section shall have a minimum of 5 years of experience in lightweight steel framing.

.2 Design of lightweight steel framing shall be by a Professional Engineer licensed in the Province of Ontario, experienced in lightweight steel framing design.
- .1 Lightweight steel framing design engineer shall be insured against professional liability in accordance with section 74 subsection (1) of Regulation 941 of the Ontario Professional Engineers Act. The alternative of compliance with subsection (2) is not acceptable.

.3 Consultant will review lightweight steel framing to verify general conformance with overall design concept of the structure.

.4 Undertake welding only by fabricators certified by Canadian Welding Bureau under Division 1 or 2.1.

.5 Use welders qualified for the base material types and thicknesses that are to be welded.

1.6 Design

.1 Design shall be based on Limit States Design Principles using factored loads and resistances including interior wind pressures.

.2 Loads and load factors shall be in accordance with the National Building Code of Canada.

.3 Resistances and resistance factors shall be determined in accordance with the National Building Code and CAN3-S136.

.4 Maximum allowable deflection of metal framing under specified loads shall be L/600.

.5 Design bridging as necessary to align members during erection, and to provide necessary structural integrity during construction and in the completed structure. Design bridging to prevent member rotation and translation perpendicular to the minor axis.

.6 Design lintels over all openings in accordance with the National Building Code.

.7 Design components or assemblies to accommodate specified erection tolerances.

.8 Member spacing shall not exceed the spacing indicated on the drawings.

.9 Allow for movement of the structure.

.10 Connections between lightweight steel framing members shall be by bolts, welding or sheet metal screws.

.11 Resistances for sheet metal screws shall be based on the manufacturer's lower bound test values multiplied by the appropriate resistance factor, ∅c, given in CAN3-S136.

.12 Provide bridging at spacing to satisfy structural requirements, but not at greater than the following: at the lesser of 1500 mm or 1/4 of span, for joists and rafters.

.13 Neglect contribution of sheathing to restrain member rotation and translation perpendicular to the minor access.

.14 Design bracing system to limit lateral deflections of building components under wind or seismic load to height/500.

.15 Use bolts, welding or sheet metal screws to make connections between lightweight framing members.

.16 Determine sheet metal screw capacities in accordance with CSA S136.

1.7 Protection

.1 Provide and maintain adequate temporary bracing for all work of this Section until permanent lateral support is in place.

1.8 Shipping, Handling and Storage

.1 Refer to Section 01 61 00 – Common Product Requirements.

.2 Deliver, handle and store materials in accordance with manufacturer's printed instructions.

.3 Use all means necessary to protect all materials before, during and after installation and to protect the installed work and materials of other trades affected by this work.

.4 In the event of damage, immediately make all repairs and replacements necessary to the approval of the Consultant and at no additional cost to the Owner.

.5 Store lightweight steel framing members on site, flat. Protect from contact with ground.

1.9 Waste Management and Disposal

.1 Refer to Section 01 74 19 – Construction Waste Management and Disposal.

1.10 Warranty

.1 Warrant the work of this Section against defects of workmanship and material, for a period of two (2) years from the date of Substantial Performance and agree to make good promptly any defects which occur or become apparent within the warranty period.

PART 2 PRODUCTS

2.1 Metal Framing

.1 Lightweight steel framing shall be as manufactured by Bailey Metal Products Ltd., CSM (Canadian Steel Manufacturing), Nicholson Rollforming Inc. or Crona Steel Products.

.2 Steel shall meet the requirements of ASTM A653/A653M-13, structural (physical) quality. Minimum grade, Grade 'D', 50 ksi yield, galvanized Z180 coating.

.3 Thickness, exclusive of coating: not less than 1.22 mm (18 gauge). Use thicker material where required by Engineered design to satisfy structural requirements. Comply with thickness tolerance requirements of CSA S136. Material thicknesses shall be greater than or equal to the specified thicknesses with underruns not to exceed the tolerance requirements of CSA S136.
.1 Thicknesses of framing members specified or indicated on drawings is exclusive of galvanized coating.

.4 Sizes as indicated on the drawings.

.5 Provide all necessary tracks, bridging, fasteners, hardware and other accessories as required for a complete installation.

.6 Provide double or triple stud or joist arrangements at locations where support of interior fixtures, fittings and accessories is required.

.7 Zinc Rich Paint: CGSB 1-GP-181M: Galvafroid by W.R. Meadows of Canada

2.2 Fastenings

.1 Sheet Metal Screws: self-tapping with a minimum coating thickness of 0.008 microns of zinc or cadmium. Screws shall have low profile heads where covered by sheathing.

.2 Sheathing Screws: As specified in Section 09 21 16.

.3 Welding Electrodes: to CSA W59, 480 mPa minimum tensile strength series.

.4 Anchors: appropriate anchors sized to suit loads, substrate material, and edge distances, manufactured by Hilti Canada, installed as per manufacturer’s recommendations.

2.3 Accessories

.1 Deflections Tracks and Slide Clips: Manufacturer’s standard telescoping or slotted tracks to suit design and load conditions.

2.4 Sheathing

.1 As specified in Section 09 21 16 – Gypsum Board.

PART 3 EXECUTION

3.1 General

.1 Fabrication and erection shall conform to the approved shop drawings. Modifications required to accommodate as-built conditions (other than minor dimensional changes) shall be submitted for approval.

.2 Provide Lightweight Steel Framing systems at exterior wall locations where indicated.

3.2 Welding

.1 Companies engaged in welding shall be certified by the Canadian Welding Bureau to CSA Standard W47.1. Companies shall have welding procedures approved and welders qualified for the base material types and thicknesses that are to be welded.

.2 Welds shall conform to CSA W59.

.3 For metal less than 3.0 mm thick, shop drawings may show nominal weld leg sizes. For such material, the effective throats of welds shall not be less than the thickness of the thinnest connected part.

.4 Touch-up welds with zinc rich paint.

3.3 Screws

.1 Steel screws shall equal or exceed the minimum diameter indicated on the shop drawings.

.2 Penetration beyond joined materials shall be not less than 3 exposed threads.

3.4 Fabrication

.1 Where specified, provide cut-outs centred in the webs of members to accommodate services. Unreinforced cut-outs shall be limited to the dimensions in CSSBI 51-06. The effect of cut-outs on the strength and stiffness of the member shall be considered.

.2 Fabrication tolerances for members shall conform CSSBI 51-06.

.3 The steel thickness exclusive of coating shall be marked on each member by embossing, stamping with indelible ink or by colour coding.

3.5 Erection

.1 Methods of construction may be either by piece (stick-built) or by fabrication into panels (panelized) either on or off site.

.2 Lightweight steel framing shall be erected true and plumb within the specified tolerances.

.3 Temporary bracing shall be employed wherever necessary to withstand all loads to which the structure may be subject during erection and subsequent construction. Temporary bracing shall be left in place as long as required for the safety and integrity of the structure. Ensure that during erection, a margin of safety consistent with the requirements of the National Building Code and CAN3-S136 exists in the uncompleted structure.

.4 Make all field measurements necessary to insure the proper fit of all members.

.5 Cutting of members may be by saw or shear. Torch cutting is not permitted.

.6 All axially loaded members shall be aligned vertically to allow for full transfer of the loads down to the foundation. Vertical alignment shall be maintained at floor/wall intersections.

.7 Completed bearing shall be maintained under tracks to provide for load transfer in axially loaded assemblies. Any discrepancy shall be brought to the attention of the Consultant.

.8 Holes that are field cut into lightweight steel framing members shall conform to the requirements of CSSBI 51-06.

.9 Splicing of axial load bearing members is not permitted.

.10 Insulation shall be placed in all jamb and header assemblies that will be inaccessible after their installation into the wall. Ensure that insulation is kept dry and not compressed. Use fibrous fill insulation as specified under Section 07 21 13.

.11 Handling and lifting of prefabricated panels shall not cause permanent distortion to any member or collateral material.

.12 Thoroughly inspect installation prior to application of covering materials and touch up all scratched or otherwise damaged surfaces with a heavy coating of zinc rich paint.

3.6 Sheathing

.1 Water resistant gypsum sheathing shall be installed horizontally on all walls. Refer to Section 09 21 16.

3.7 Inspection

.1 The lightweight steel framing Design Engineer, responsible for the production of the shop drawings, shall provide periodic field review during construction and shall submit reports in accordance with Section 1.4.
  .1 The cost of this field review shall be paid for by the Contractor.

.2 Additional inspection and testing of materials and workmanship shall be carried out by a qualified Independent Inspection Agency appointed by the Consultant.
  .1 The cost of this additional inspection shall be paid for out of the Cash Allowances for Inspection and Testing.

  .2 Any testing or inspection required by the Consultant because of an error by the Contractor or due to departure from the contract documents by the Contractor, shall be paid for by the Contractor.

  .3 Inspection shall include:
    .1 Checking that mill test reports are properly correlated to materials.

.2 Sampling fabrication and erection procedures for general conformity to the requirements of the specification.
.3 Checking that the welding conforms to the requirements of this specification.
.4 Checking fabricated members against specified member shapes.
.5 Visual inspection of all welded connections including sample checking of joint preparation and fit-up.
.6 Sample checking of screwed and bolted joints.
.7 Sample checking that tolerances are not exceeded during fit-up or erection.
.8 Additional inspection and testing of welded connections as required by CSA W59.
.9 General inspection of field cutting and alterations required by other trades.
.10 Submission of reports to the Consultant, the Contractor and the authorities having jurisdiction covering the work inspected with details of deficiencies discovered.

.4 Provide the necessary cooperation to insure that the inspection can proceed.

.5 The inspection provided in this section does not relieve the Contractor of his responsibility for the performance of the contract. The Contractor is solely responsible for quality control and he shall implement his own supervisory and quality control procedures.

.6 Materials or workmanship not conforming to the requirements of the contract documents may be rejected at any time during the progress or work.

3.8 Cleaning

.1 Proceed in accordance with Section 01 74 11 – Cleaning.

End of Section

PART 1 GENERAL

1.1 General

.1 Conform to the requirements of Division 1.

1.2 Related Sections

.1	Section 03 30 00	Cast-in-Place Concrete
.2	Section 04 05 19	Masonry Anchorage and Reinforcing
.3	Section 04 22 00	Concrete Unit Masonry
.4	Section 06 10 00	Rough Carpentry
.5	Section 06 20 00	Finish Carpentry
.6	Section 09 21 23	Interior Painting

1.3 References

.1 The Ontario Building Code.

.2 ASTM International, (ASTM)

- .1 ASTM A53/A53M-12 Standard Specification for Pipe, Steel, Black and Hot Dipped, Zinc Coated, Welded and Seamless.
- .2 ASTM A123/A123M-12 Standard Specification for Zinc (Hot Dip Galvanized) Coatings on Iron and Steel Products.
- .3 ASTM A153/A153M-09 Standard Specification for Zinc Coating (Hot Dip) on Iron and Steel Hardware.
- .4 ASTM A264-12 Standard Specification for Stainless Chromium-Nickel Steel-Clad Plate, Sheet, and Strip.
- .5 ASTM A269/A269M-15a Specification for Seamless and Welded Austenitic Stainless Steel Tubing for General Service.
- .6 ASTM A276/A276M-17 Standard Specification for Stainless Steel Bars and Shapes
- .7 ASTM A307-10 Standard Specification for Carbon Steel Bolts and Studs, 60 000 PSI Tensile Strength.
- .8 ASTM A325-10 Standard Specification for Structural Bolts, Steel, Heat Treated, 120/105 ksi Minimum Tensile Strength.
- .9 ASTM A385/A385M-11 Standard Practice for Providing High Quality Zinc Coatings (Hot Dip).
- .10 ASTM A570, Hot-Rolled Carbon Steel Sheet and Strip, Structural Quality.
- .11 ASTM A1008/A1008M-12 Standard Specification for Steel, Sheet, Cold Rolled, Carbon, Structural, High Strength Low Alloy, High Strength Low Alloy with Improved Formability, Solution Hardened, and Bake Hardenable
- .12 ASTM A1011/A1011M-12a Standard Specification for Steel, Sheet and Strip, Hot-Rolled, Carbon, Structural, High-Strength Low-Alloy, High-Strength Low-Alloy with Improved Formability, and Ultra-High Strength
- .13 ASTM D6386-10 Standard Practice for Preparation of Zinc (Hot Dip Galvanized) Coated Iron and Steel Product and Hardware Surfaces for Painting

.3 Canadian Standards Association (CSA International)

- .1 CSA G40.20-04/G40.21-04 (R2009), General Requirements for Rolled or Welded Structural Quality Steel/Structural Quality Steel
- .2 CSA-S16-09, Design of Steel Structures
- .3 CAN/CSA G164-M92 (R2003), Hot Dip Galvanizing of Irregularly Shaped Articles.
- .4 CSA-W47.1-09, Certification of Companies for Fusion Welding of Steel Structures.
- .5 CSA W48-06 (R2011), Filler Metals and Allied Materials for Metal Arc Welding
- .6 CSA W59-03 (R2008) Welded Steel Construction (Metal-Arc Welding)

.4 Canadian General Standards Board (CGSB)
  .1 CAN/CGSB 1.40-97, Anticorrosive Structural Steel Alkyd Primer
  .2 CAN/CGSB 1.108-M89, Bituminous Solvent Type Paint
  .3 CAN/CGSB 1.181-99, Ready Mixed, Organic Zinc Rich Coating.
.5 Canadian Sheet Steel Building Institute (CSSBI)
.6 Steel Structures Painting Council, Systems and Specifications Manual.
  .1 CISC/CPMA 1-73a, A Quick drying One-coat Paint for Use on Structural Steel.
  .2 CISC/CPMA 2-75, A Quick drying Primer for Use on Structural Steel.
.7 American Welding Society AWS D1.6, Structural Welding Code - Stainless Steel.

1.4 Submittals

.1 Make submittals in accordance with Section 01 33 00 – Submittal Procedures.

.2 Shop Drawings:
  .1 Submit Shop and Erection Drawings for review.
  .2 Verify site dimensions before proceeding with shop fabrication and to suit field conditions and field openings.
  .3 Show and describe in detail 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, including type, size and description of all fasteners and anchors.
  .4 Indicate connections to building structure.
  .5 Shop drawings for all metal fabrications shall be stamped and signed by a Professional Engineer registered in the Province of Ontario.

1.5 Qualifications

.1 Work of this Section shall be executed by a firm thoroughly conversant with laws, bylaws and regulations which govern and capable of workmanship of best grade of modern shop and field practice known to recognized manufacturers specializing in this work, and having a minimum ten (10) years proven experience in the fabrication of high quality metal fabrications. Use workmen skilled in work of this Section.

.2 Welding shall be performed by trades persons certified by The Canadian Welding Bureau under CSA Standard W47.1.

1.6 Examination

.1 All dimensions shall be taken from the drawings and checked against the building. Be responsible for the correctness of such measurements and report to the Consultant in writing all discrepancies between measurements at building and those shown on drawings prior to commencing work. Verify location of anchor bolts and embedded steel and ensure that work prepared by other trades is at a proper elevation, on line, level and true.

1.7 Shipping, Handling and Storage

.1 Refer to Section 01 61 00 – Common Product Requirements.

.2 Label, tag or otherwise mark work supplied for installation by other Sections to indicate its function, location and shop drawing description.

.3 Protect architecturally exposed materials during fabrication, delivery, handling, storage and erection to prevent marring of surfaces exposed to view, by marking, bending, denting or coarse grinding.

1.8 Waste Management and Disposal

.1 Refer to Section 01 74 19 – Construction Waste Management and Disposal.

PART 2 PRODUCTS

2.1 Materials

.1 Structural Steel Sections and Steel Plate: CSA G40.20-04/G40.21-04 (R2009), Grade 350W.

.2 Architectural and Miscellaneous Mild Steel: CSA G40.20-04/G40.21-04 (R2009), Grade 300W.

.3 Machine Bolts and Nuts: ASTM Standard A307-10 low carbon steel externally and internally threaded standard fasteners. Dimensions, sizes, thread, strength, quality and type of items shall be designed for the work intended. Exposed fasteners and anchors shall be same material, colour and finish as the metal to which they are applied.

.4 Sheet Steel: (Commercial Quality) ASTM A1008/A1008M-12, stretcher leveled or temper rolled.

.5 Steel Pipe: ASTM A53/A53M-12, Schedule 40, Grade B.

.6 Welding Materials: CSA W59.

.7 Welding Electrodes: CSA W48 Series.

.8 Sulphur: Commercial Grade for setting of steel posts.

.9 Adhesive Anchors: Hilti Epoxy Adhesive Anchors sized to suit loading conditions, suitable for substrate and as specified on structural drawings.

.10 Grout: non-shrink, non-metallic, flowable, 15 MPa at 24 hours.

.11 Isolation Coating: alkali resistant bituminous paint to CAN/CGSB 1.108-M89.

2.2 Stainless Steel

.1 Stainless steel shall be grade and type designated below for each form required:

.1	Plate	ASTM A264	Type 316L
.2	Bar Stock	ASTM A276	Type 316L
.3	Pipe	ASTM A312	Type 316L
.4	Sheet	ASTM A167	Type 316L
.5	Bolts	ASTM A593	Type 316L
.6	Nuts	ASTM A594	Type 316L

.7 Pickle and passivate stainless steel prior to fabrication and installation to remove any latent black steel to ASTM A380.

.2 Stainless Steel Bolts and Nuts: To ASTM F593 and ASTM F594

2.3 Finishes

.1 Primers: All primers for metal fabrications are to be factory applied under the requirements of this Section. Refer to Finish Schedules in Section 09 91 23 for types of primers required for each application.

.2 Pre Paint Finish: For galvanized surfaces to be exposed and finish painted, to ASTM D6386–10.

.3 Galvanizing: hot dipped with zinc coating to CAN/CSA G164-M92 (R2003), or ASTM A153/A153M-09.

.4 Galvanized) coatings on products fabricated from rolled, pressed and forged steel shapes, plates, bars and strips. Galvanized after all welding and grinding complete. No welding or grinding of galvanized products allowed.

.5 Zinc Rich Primer: zinc rich, organic, ready mix to CAN/CGSB 1.181-92. Low VOC type.

.6 Stainless Steel: NAAMM AMP-504 Finish No. 4.

PART 3 EXECUTION

3.1 General

.1 Fabricate to reviewed shop drawings and in general to details, sizes and materials indicated on drawings and specified herein.

.2 Fabricate work square, true, straight and accurate to required size, with joints closely fitted and properly secured.

.3 Fabricate work complete with all components required for anchoring; bolting or welding to structural frame; standing free or resting in frames or sockets; in a safe and sure manner.

.4 Where possible fit and shop assemble various sections of the work and deliver to site in largest practicable sections. Where shop fabricating is not possible make trial assembly in shop.

.5 Ensure exposed welds are continuous for length of each joint.

.6 Grind and fill all welds after inspection and acceptance and leave ready for prime painting.

.7 Fill all open joints, depressions, seams with metallic paste filler or by continuous brazing or welding and grind smooth to true sharp arises and profiles.

.8 Fit joints and intersecting members accurately. Make work in true planes with adequate fastenings.

.9 Supply all fastenings, anchors, accessories required for fabrication and erection of work of this Section. Make thread dimensions such that nuts and bolts will fit without re-threading or chasing threads.

.10 Make exposed metal fastenings and accessories of same material, texture, colour and finish as base metal on which they occur unless otherwise shown or specified. Keep exposed fastenings to an absolute minimum evenly spaced and neatly laid out. Make fastenings of permanent type unless otherwise indicated.

.11 Welding shall be done by the shielded metal arc method in accordance with the requirements CSA W59. Welding operators shall be currently certified under CSA W47.1 for the work they are performing.

.12 Surfaces to be welded shall be free from loose scale, rust, paint, or other foreign matter. Where weld material is deposited in two (2) or more layers, each layer shall be cleaned before the next layer is deposited. Care shall be taken to minimize stresses due to heat expansion, contraction and distortion by using proper sequence in welding and by approved methods.

.13 Appearance, quality of welds made, methods of correcting defective work shall be in accordance with CSA W59.

3.2 Shop Painting

.1 Cleaning Steel:
- .1 Clean steel, whether it is to be painted or not, to the degree required by CISC/CPMA 1-73a, except as specified below.
- .2 Prepare galvanized items scheduled to be painted in accordance with the requirements of Section 09 91 23, and ASTM D6386-10.
- .3 Steel to receive a shop or field paint finish shall be cleaned in accordance with Sections 09 91 23 or SSPC SP6, whichever produces a surface which has less rust and mill scale.
- .4 Clean steel which is specified to be painted to CISC/CPMA 2-75 in accordance with that Standard.
- .5 Clean steel which is specified to receive an organic zinc-filled epoxy primer, or zinc-rich paint, or inorganic zinc primer, in accordance with SSPC-SP 6, Commercial Blast Cleaning.
- .6 Clean welds by wire brushing and wash down with clean water, to remove the chemical residues left by the electrodes, prior to painting.

.2 The following surfaces shall not be painted:
- .1 Surfaces and edges to be field welded. If painted, remove paint for field welding for a distance of at least 50 mm on all sides of the joint, to ensure proper fusion of the metal.
- .2 The contact surfaces of friction type connections assembled by high strength bolts.
- .3 Portions of steel members which are to be encased in or in contact with concrete or masonry.
- .4 Galvanized items not specifically indicated to be painted.

.3 Preparation and priming of all metal work which will be exposed to view and which is scheduled to be finish painted, shall be in accordance with the requirements of Section 09 91 23.

.4 All other concealed or unpainted ferrous metal work shall be given one prime paint coat type CGSB 1.40 and in accordance with CISC/CPMA 2-75. Work paint into all corners and all joints. Metal parts in contact shall be primed before shop assembly. Priming damaged during erection or through lack of protection shall be cleaned and touched up.

.5 Use primer unadulterated, as prepared by manufacturer. Paint on dry surfaces, free from rust, scale, grease. Do not paint when temperature is lower than 7^{o}C.

.6 Metals in contact with other dissimilar metals, concrete or masonry materials shall be insulated or separated from one another to prevent corrosion, staining or electrolysis by use of bituminous paint.

3.3 Galvanizing

.1 Steel members, fabrications, and assemblies shall be galvanized after fabrication by the hot dip process in accordance with CAN/CSA G164-M92 (R2003) or A123/A123M-12.

.2 Prepare metals to be galvanized in accordance with requirements of ASTM D6386.

.3 Bolts, nuts, washers, iron, and steel hardware components shall be galvanized in accordance with CAN/CSA G164-M92 (R2003) or ASTM A153/A153M-09.

.4 Coating Requirements:
.1 Weight: the weight of the galvanized coating shall conform to Table 1 of CAN/CSA G164-M92 (R2003), or paragraph 6.1 of A123/A123M-12 and Table 1 of ASTM A153/A153M-09 (as appropriate).
.2 Surface Finish: The galvanized 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. The integrity of the coating shall be determined by visual inspection and coating thickness measurements.
.3 Adhesion: the galvanized coating shall be sufficiently adherent to withstand normal handling.

3.4 Angle Lintels

.1 Provide all loose steel angle lintels required to support openings and recesses in masonry walls, whether indicated on the drawings or not. Refer to Architectural, Structural and Mechanical drawings for locations of openings. Lintels shall be as scheduled on the Structural drawings.

.2 Steel angles: CAN3 G40.21, Grade 300W, sizes indicated for openings. Provide 150 mm minimum bearing at ends unless otherwise indicated.

.3 Weld or bolt back-to-back angles to profiles as indicated.

.4 Supply for installation by Sections 04 22 00.

.5 Lintels shall be prime painted.

3.5 Vanity and Shelf Support Brackets

.1 Provide supports to vanities and shelves where indicated, constructed of steel angles formed to profile indicated. Locate supports centered between each lavatory and at end of vanity, as detailed.

.2 Finish: Shop coat primer. Fabrications in wet areas to be shot blasted and painted with zinc rich primer.

3.6 Miscellaneous Overhead Structural Supports

.1 Provide steel angle, HSS and miscellaneous structural framing to support tops of new partition walls and rolling grills / partitions as detailed on the drawings. All rough edges to be ground smooth.

.2 Finish: Shop coat primer.

3.7 Installation

.1 Supervise the setting of bases, anchor bolts, and other steel to concrete connections. Cutting of base plates to accommodate anchor bolts is cause for rejection of base plates.

.2 Provide all bracing and shoring required to support the work of this Section during installation.

.3 Work shall be fabricated and erected square, plumb and true, straight, level and accurately fitted to size detailed on reviewed Shop Drawings. All joints shall be welded unless otherwise indicated. Exposed welds shall be ground smooth and/or flush. Exposed work shall be finished smooth and even, close joints and neat connections. Exposed welds continuous for full length of joints.

.4 Where anchors or fastenings, sleeves, have to be built in by other trades, supply all necessary templates, instructions and supervision to ensure satisfactory installation.

.5 Do all drilling, cutting and fitting necessary to attach this work to adjoining work and make it complete.

.6 Provide all components required for anchoring. Make anchoring in concealed manner where possible. Exposed anchors shall be approved by the Consultant, shall be neat, and of the same material, colour, texture and finish of base metal on which they occur. Exposed fastenings shall be evenly spaced.

.7 Securely anchor components in place. Unless otherwise indicated, anchor components as follows:
- .1 To concrete and solid masonry with expansion or epoxy adhesive type anchors.
- .2 To hollow construction with toggle bolts.
- .3 To thin metal with screws or bolts.
- .4 To thick metal with bolts or by welding.
- .5 Fill space between railing members and sleeves with non-shrink grout.

.8 Grind all field welds smooth.

.9 Touch up shop coat of prime paint where damaged by field erection.

.10 Touch up galvanized finishes with zinc rich paint.

3.8 Schedule

.1 General:
- .1 Supply and install all metal fabrications indicated on Drawings, and not included in the work of other Sections.
- .2 Coordinate and sequence the work to ensure timely delivery to the site, of all items to be built in.
- .3 Where items are required to be built into masonry, concrete or other work supply such items to respective Sections with all anchors and accessories for building in.
- .4 All items shall be of sizes and as detailed on drawings.
- .5 Coordinate with Section 09 91 23 for preparation of exposed metal items required to have finish coatings applied in the field.
- .6 Review all coordination drawings prior to installation of materials, to ensure that no interferences with the work of other Sections will occur.

3.9 Cleaning

.1 Proceed in accordance with Section 01 74 11 – Cleaning.

End of Section

PART 1 GENERAL

1.1 General

.1 Conform to the requirements of Division 1.

1.2 Related Sections

.1 Section 04 22 00 Concrete Unit Masonry
.2 Section 05 50 00 Metal Fabrications
.3 Section 06 20 00 Finish Carpentry
.4 Section 08 11 00 Metal Doors and Frames

1.3 References

.1 Canadian Standards Association (CSA)
  .1 CSA-080-M Wood Preservation
  .2 CSA 086.1 Engineering Design in Wood (Limit States Design).
  .3 CSA 0121-M Douglas Fir Plywood.
  .4 CSA 0141 Softwood Lumber.
  .5 CSA 0151-M Canadian Softwood Plywood
  .6 CSA B111 Wire Nails, Spikes and Staples.
  .7 CSA G164 Hot Dip Galvanizing of Irregularly Shaped Articles.
.2 Underwriters Laboratories Canada (ULC)
  .1 CAN/ULC-S102 Standard Method of Test for Surface Burning Characteristics of Building Materials and Assemblies.
.3 National Lumber Grading Authority (NGLA)
  .1 Standard Grading Rules for Canadian Lumber, Latest Edition.

1.4 Quality Assurance

.1 Sawn lumber shall be identified by the grade stamp of an association or independent grading agency certified by the Canadian Lumber Standards Accreditation Board.

.2 Plywood identification shall be by grade mark in accordance with applicable CSA Standards.

.3 Pressure treated materials shall conform to CAN/CSA-080.1.

1.5 Shipping, Handling and Storage

.1 Refer to Section 01 61 00 – Common Product Requirements.

.2 Materials shall not be delivered before they are required for proper conduct of the work.

.3 Protect materials, under cover, both in transit and on the site.

.4 Store materials to prevent deterioration or the loss or impairment of their structural and other essential properties. Do not store materials in areas subject to high humidity and areas where masonry and concrete work are not completely dried out.

.5 Protect work from damage during storage, handling, installation and until the building is turned over to the Owner. Make good damage and loss without additional expense to the Owner.

.6 Store sheathing materials level and flat, in a dry location. Protect panel edges from moisture at all times.

1.6 Waste Management and Disposal

.1 Refer to Section 01 74 19 – Construction Waste Management and Disposal.

PART 2 PRODUCTS

2.1 Materials

.1 General: Use materials specified herein.

.2 Timber Material shall be 'Grade Stamped'.

.3 Construction Lumber: To CAN/CSA 0141 Softwood Lumber graded to NLGA Standard Grading Rules for Canadian Lumber, published by the National Lumber Grades Authority. All lumber shall bear grade stamps. Moisture content of softwood lumber not to exceed 19% at time of installation.
- .1 Nailing strips, furring and strapping: No. 4 S-P-F.
- .2 Fitment framing: No. 1 S-P-F.
- .3 Glue end jointed (finger jointed) material is not acceptable.

.4 Canadian Softwood Plywood: to CSA 0151-M, standard construction, good one or both sides as required, thickness as shown or specified.

.5 Douglas Fir Plywood: To CSA 0121-M, standard construction, good one side, thickness as shown on the drawings.

.6 Nails, Spikes and Staples: To CSA B111.

.7 Bolts: 12.5 mm diameter, galvanized, complete with nuts and washers.

.8 Proprietary Fasteners: toggle bolts, expansion shields and lag bolts, screws and lead or inorganic fibre plugs, recommended for purpose by manufacturer.

.9 Wood Preservative to CAN/CSA-080-M.

.10 Adhesive: contractor’s gun grade cartridge loaded wood adhesive, general purpose, to CSA 0112 Series and CAN/CGSB-71.26.

.11 Galvanizing: to CAN/CSA-G164. Use galvanized fasteners and hardware for preservative treated lumber, and materials in contact with concrete or masonry.

Part 3 Execution

3.1 Installation

.1 Workmanship
- .1 Execute work using skilled mechanics according to best practice, as specified herein and indicated on drawings.

.2 Lay out work carefully and to accommodate work of other trades. Accurately cut and fit; erect in proper position true to dimensions; align, level, square, plumb, adequately brace, and secure permanently in place. Join work only over solid backing.

.2 Rough Hardware

.1 Work shall include rough hardware such as nails, bolts, nuts, washers, screws, clips, hangers, connectors, strap iron, and operating hardware for temporary enclosures.

.2 Fasten rough hardware; to hollow masonry units with adequate size toggle bolts; to solid masonry or concrete surfaces with expansion shields and lag screws. Where screws are required, use lead or inorganic fibre plugs. Wood or organic plugs are not permitted. Do not ramset fastenings into concrete floor or concrete block or structural steel sections.

.3 Blocking:

.1 Provide solid wood or plywood backing to walls to support cabinetwork, vanities, accessories, specialty items and the like. Install blocking continuous between metal studs and of sufficient height to support fitments.

.2 Provide wood strapping where required to support fitments and equipment.

.3 Provide wood strapping lagged to walls and as required to support lockers. Coordinate with Section 10 51 23.

.4 Decking:

.1 Provide plywood decking above framed interior roof structures where indicated.

.2 Fasten to cold formed framing with galvanized seldf tapping screws.

3.2 Cleaning

.1 Proceed in accordance with Section 01 74 11 – Cleaning.

End of Section

PART 1 GENERAL

1.1 General

.1 Conform to the requirements of Division 1.

1.2 Related Sections

.1 Section 06 10 00 Rough Carpentry
.2 Section 06 40 00 Architectural Woodwork.
.3 Section 07 92 00 Joint Sealants
.4 Section 08 11 00 Metal Doors and Frames
.5 Section 08 71 10 Door Hardware
.6 Section 09 21 16 Gypsum Board
.7 Section 09 91 23 Interior Painting
.8 Section 10 28 10 Toilet and Bath Accessories.

1.3 References

.1 American National Standards Institute (ANSI)
  .1 ANSI A208.1-99, Particleboard.
  .2 ANSI A208.2-02, Medium Density Fibreboard (MDF).
  .3 ANSI/HPVA HP-1-2004, Standard for Hardwood and Decorative Plywood.
.2 ASTM International, (ASTM)
  .1 ASTM E 1333-96(2002), Standard Test Method for Determining Formaldehyde Concentrations in Air and Emissions Rates from Wood Products Using a Large Chamber.
.3 Architectural Woodwork Manufacturers Association of Canada (AWMAC) and Architectural Woodwork Institute (AWI)
  .1 Architectural Woodwork Quality Standards Illustrated, 8th edition, Version 1.0 2003.
.4 Canadian Plywood Association (CanPly)
  .1 The Plywood Handbook 2005.
.5 Canadian Standards Association (CSA International)
  .1 CSA B111-74(R2003), Wire Nails, Spikes and Staples.
  .2 CAN/CSA-G164-M92(R2003), Hot Dip Galvanizing of Irregularly Shaped Articles.
  .3 CSA O121-M89(R2003), Douglas Fir Plywood.
  .4 CAN/CSA O141-91(R1999), Softwood Lumber.
  .5 CSA O151-04, Canadian Softwood Plywood.
  .6 CSA Z760-94, Life Cycle Assessment

.6 Forest Stewardship Council (FSC)
  .1 FSC-STD-01-001-2004, FSC Principle and Criteria for Forest Stewardship.
  .2 FSC-STD-20-002-2004, Structure and Content of Forest Stewardship Standards V2-1
  .3 FSC Accredited Certified Bodies.
.7 National Hardwood Lumber Association (NHLA)
  .1 Rules for the Measurement and Inspection of Hardwood and Cypress 1998.
.8 National Lumber Grades Authority (NLGA)
  .1 Standard Grading Rules for Canadian Lumber 2005.
.9 South Coast Air Quality Management District (SCAQMD), California State (SCAQMD)
  .1 SCAQMD Rule 1168-03, Adhesives and Sealants Applications
.10 Underwriters Laboratories of Canada (ULC)
  .1 CAN4-S104-80(R1985), Standard Method for Fire Tests of Door Assemblies.
  .2 CAN4-S105-85(R1992), Standard Specification for Fire Door Frames, meeting the Performance Required by CAN4-S104

1.4 Submittals

.1 Make submittals in accordance with Section 01 33 00 – Submittal Procedures.

.2 Submit duplicate 300 mm long samples of each type of solid wood or 300 x 300 mm square type of plywood to receive stain or natural finish.

1.5 Quality Assurance

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

.2 Plywood in accordance with CSA and ANSI standards.

.3 Wood materials certified by Forestry Stewardship Council.

1.6 Shipping, Handling and Storage

.1 Refer to Section 01 61 00 – Common Product Requirements.

.2 Protect materials against dampness during and after delivery.

.3 Store materials in ventilated areas, protected from extreme changes of temperature or humidity.

1.7 Waste Management and Disposal

.1 Refer to Section 01 74 19 – Construction Waste Management and Disposal.

PART 2 PRODUCTS

2.1 Lumber Materials

.1 Softwood lumber: unless specified otherwise, S4S, moisture content 19% or less in accordance with following standards:
  .1 CAN/CSA- O141.
  .2 NLGA Standard Grading Rules for Canadian Lumber.
  .3 AWMAC custom premium grade, moisture content as specified.
  .4 Machine stress-rated lumber is acceptable.

.2 Hardwood Lumber: To NHLA requirements, moisture content of 6% maximum, maple species, AWMA Custom Grade.

2.2 Panel Materials

.1 Douglas Fir Plywood (DFP): to CSA O121-M89 (R2003), standard construction.
  .1 Forestry Stewardship Council (FSC) certified.
  .2 Urea-formaldehyde free.

.2 Canadian Softwood Plywood (CSP): to CSA O151-04, standard construction.
  .1 Forestry Stewardship Council (FSC) certified.
  .2 Urea-formaldehyde free

2.3 Plastic Laminate

.1 Plastic laminate facing sheet: ANSI/NEMA LD 3-2005 High-Pressure Decorative Laminates (HPDL) PF-S and GP-S;
- .1 Backing sheet: BK Grade by manufacturer of facing sheet.
- .2 Core: CSA O151
- .3 Laminating adhesive: CSA O112.
- .4 Core sealer: clear water resistant synthetic resin sealer.
- .5 Colours,
  - .1 Wilsonart Standard Laminate – Washi Pewter 5018-38 or approved equal on all laminate counter top surfaces.
  - .2 Wilsonart Promoted Finish – Atlantis D25-60 Matte Finish for all control panel surfaces.

2.4 Solid Surfacing

.1 As specified in Section 06 61 16

2.5 Accessories

.1 Rough Hardware: Bolts, lag screws, anchors, nails and expansion shields required to secure this portion of work. Rough hardware hot dip galvanized conforming to latest edition of CAN/CSA-G164. All fasteners used in damp or wet areas to be suitable for use in corrosive environment. Use hot dipped galvanized or other material approved by the Consultant.

.2 Nails and staples: to CSA B111-74(R2003), galvanized to CAN/CSA- G164-M92 (R2003).

.3 Wood screws: to CSA B 35.4 plain type and size to suit application.

.4 Stainless Steel hardware: Type 316 Stainless steel for exposed or wet locations, tamper proof.

.5 Splines: wood or metal to suit application.

.6 Adhesive: recommended by manufacturer, waterproof type, maximum VOC limit 30 g/L SCAQMD Rule 1168 - Adhesives and Sealants Applications.

PART 3 EXECUTION

3.1 Construction

.1 Fastening:
- .1 Position items of finished carpentry work accurately, level, plumb, true and fasten or anchor securely.
- .2 Design and select fasteners to suit size and nature of components being joined. Use proprietary devices as recommended by manufacturer.
- .3 Set finishing nails to receive filler. Where screws are used to secure members, countersink screw in round smooth cut hole and plug with wood plug to match material being secured.
- .4 Replace items of finish carpentry with damage to wood surfaces including hammer and other bruises.

3.2 Fabrication

.1 General:
- .1 Field measure all dimensions.

.2 Fabricate all finish carpentry items to AWMAC premium grade, and in accordance with the reviewed shop drawings.
.3 Set nails and screws, apply stained plain wood filler to indentations, sand smooth and leave ready to receive finish.
.4 Provide 10 mm thick solid matching wood strip on plywood and particle board edges 13 mm or thicker, exposed in final assembly.
.5 Ease edges of solid lumber components to 1.6 mm radius.

.2 Plastic Laminate Components
.1 Fabricate plastic laminate window stools as detailed. Stools shall be minimum 19 mm thick plastic laminate plywood, with edge banding on all exposed faces. Fabricate in one piece, without joins, wherever as possible. Where necessary, joins shall be centred on window mullions and tightly butted together with concealed splines.
.2 Fabricate vanities and change room shelving units as detailed.
.3 Unless otherwise specified herein, comply with requirements of ANSI/NEMA LD 3 Annex 'A'.
.4 Assembly: Bond plastic laminate to core with adhesive, under pressure.
.5 Core: unless otherwise indicated: 19 mm thick.
.6 Balanced construction: plastic laminate covered components shall be of balanced construction, with plastic laminate on both faces of core. Seal core edges not covered with plastic laminate.
.7 Use largest practicable plastic laminate sheet size.
.8 Provide joints symmetrically; provide joints as corners and at changes in superficial areas; provide concealed draw bolt anchors and joints. All butt joints shall have a blind spine.
.9 Openings and cutouts:
.1 Radius internal corners at least 3 mm and chamfer edges.
.2 Where core edge is to remain exposed, cover with plastic laminate edging.
.3 Where core edge is to be concealed, seal with sealer.

3.3 Installation

.1 Do finish carpentry to Quality Standards of the Architectural Woodwork Manufacturers Association of Canada (AWMAC), except where specified otherwise.

.2 All fastenings shall be concealed.

.3 Provide heavy duty grounds as necessary for secure installation of finish carpentry work.

.4 All wood surfaces shall be sanded smooth, ready to receive finish.

.5 Scribe and cut as required, fit to abutting walls and surfaces, fit properly into recesses and to accommodate piping, columns, fixtures, outlets or other projecting, intersecting or penetrating objects.

.6 Form joints to conceal shrinkage.

.7 Set and secure materials and components in place, rigid plumb and square.

.8 Design and select fasteners to suit size and nature of components being joined. Use proprietary devices as recommended by manufacturer.

.9 Set finishing nails to receive filler. Where screws are used to secure members, countersink screws in round, cleanly cut hole and plug with wood plug to match material being secured.

.10 Replace items of finish carpentry with damage to wood surfaces including hammer and other

bruises.

.11 Install solid surfacing countertops as specified in Section 06 61 16.

.12 Apply mildew resistant clear silicone sealant to perimeter of all vanity tops as specified in Section 07 92 00.

3.4 Door Installation

.1 Install doors in accordance with instructions in Section 08 11 00 and manufacturer's printed instructions.

3.5 Finish Hardware Installation

.1 Finish hardware will be supplied for installation under this Section.

.2 Prepare doors and frames in accordance with manufacturer's instructions and templates. Install finish hardware complete in all respects, hang doors and make adjustments necessary.

.3 Doors shall swing freely. Where thresholds are to be used, door bottom shall be finished to suit thresholds as required.

3.6 Miscellaneous

.1 Install Toilet and Bath Accessories as specified in Section 10 28 10, including accessories supplied by Owner.

3.7 Cleaning

.1 Proceed in accordance with Section 01 74 11 – Cleaning.

End of Section

PART 1 GENERAL

1.1 General

.1 Conform to the requirements of Division 1.

1.2 Related Sections

.1 Section 05 50 00 Metal Fabrications
.2 Section 06 10 00 Rough Carpentry
.3 Section 06 20 00 Finish Carpentry
.4 Section 06 61 16 Solid Surfacing
.5 Section 07 92 00 Joint Sealants

1.3 References

.1 ANSI A208.1, Mat-Formed Wood Particleboard
.2 CAN/CGSB-11.3-M, Hardboard
.3 CSA O115-M, Hardwood and Decorative Plywood
.4 CSA O121-M, Douglas Fir Plywood
.5 CSA O151-M, Canadian Softwood Plywood
.6 CSA O153-M, Poplar Plywood

1.4 Submittals

.1 Make submittals in accordance with Section 01 33 00 – Submittal Procedures.

.2 Submit detailed shop drawings for cabinetwork showing proposed assembly, connections, anchorage, materials, dimensions, thickness, and finishes.

.3 Submit duplicate, 300 mm long samples of each type of solid wood and 300 x 300 mm samples of each type of plywood used in exposed work and scheduled to receive stained or natural finish, complete with specified finish, prior to fabrication of cabinetwork.

.4 Submit sample of each type of cabinet hardware component used.

1.5 Quality Assurance

.1 Unless otherwise specified, carry out finish carpentry work in accordance with the requirements of "Millwork Standards" (latest issue) of Architectural Woodwork Manufacturers' Association of Canada (AWMAC), Custom Grade

1.6 Definition

.1 "Exposed" when referred to in this Section, shall mean all parts which can be viewed and shall include interiors of cabinets, backs of doors, shelving and gables.

1.7 Shipping, Handling and Storage

.1 Refer to Section 01 61 00 – Common Product Requirements.

.2 Deliver, handle and store materials in accordance with manufacturer’s printed instructions.

.3 Protect against damage, including damage by excessive changes in moisture content, during delivery and storage. Maintain minimum storage temperature of 16° C, and relative humidity of 25% to 55%.

.4 Cover plastic laminate faces at shop with heavy Kraft paper.

.5 Do not deliver finish carpentry components to site before all wet trades are completed, the building is closed in and humidity conditions on site are acceptable. Do not deliver during rain or damp weather

.6 Store materials on site in such a way as to prevent deterioration or loss or impairment of essential properties. Prevent excessive moisture gain of materials.

1.8 Protection

.1 Provide coverings as necessary to protect finish carpentry components from damage of any kind during storage and after installation.

1.9 Waste Management and Disposal

.1 Refer to Section 01 74 19 – Construction Waste Management and Disposal.

1.10 Warranty

.1 At no cost Owner, remedy any defects in work of this Section due to delamination and warping of plastic laminated finish carpentry components for a period of two (2) years from date of Substantial Performance. Provide Owner with a written warranty to this effect.

PART 2 PRODUCTS

2.1 Materials

.1 Solid Wood:
- .1 Unless otherwise indicated, provide AWMAC Premium Grade.
- .2 All wood materials shall be new, straight and clean, free of sap, knots, pitch, and other defects, except as permitted by applicable grading rules.
- .3 All wood shall be kiln dried to a maximum moisture content of 7%.
- .4 Softwood: to CSA 0141, dressed all sides used in concealed locations.

.2 Plywood:
- .1 Grade A face, book matched, flat cut maple face and No. 3 edge.
- .2 Soft Plywood: to CSA 0151-M Standard Grade, solid two sides. Use in concealed locations only, except as indicated.

.3 Hardboard: To CGSB 11-GP-3M, Type 2, 6 mm thick or as indicated.

.4 Plastic Laminate Components:
- .1 Plastic laminate facing sheet: CSA CAN3-A172-M, PF-S and GP-S;
  - .1 Colour: Formica, Grayed Oak, Matte finish.
  - .2 Backing sheet: BK Grade by manufacturer of facing sheet.
  - .3 Core: CAN3-0188.1M, Grade R.
  - .4 Laminating adhesive: CAN3-0112 Series M.
  - .5 Core sealer: clear water resistant synthetic resin sealer.

.2 Fasteners and Adhesive:
.1 Nails and staples: CSA B111, galvanized, spiral head nails.
.2 Screws: To CSA B35.4 zinc, cadmium or chrome plated steel.
.3 Splines: wood or metal, to suit application.
.4 Adhesive: To CSA 0112-M, type as appropriate for the intended application waterproof.Complying with ANSI/WDMA I.S-1 series. Contact bond not acceptable.
.5 Avoid the use of adhesives, preservatives, synthesizing agents and finish coatings that contain formaldehyde and high V.O.C. content.

.3 Cabinet Hardware: Products listed are a standard of acceptance. Products by other manufacturers, of equal quality and similar appearance may also be accepted subject to review and approval by Consultant.
.1 Shelf Standards: Knape & Vogt KV80, Anochrome finish.
.2 Brackets: Knape & Vogt KV180, Anochrome finish.
.3 Hinges: Blum concealed hinges, 125° clip and 125° opening with self-closing spring. Full or half overlay. Nickel plated steel.
.4 Cabinet Pulls: Richelieu D-Pull No: 30134-170, 96 mm c.c. brushed stainless steel.
.5 Cabinet Locks: CCL 0737 pin tumbler MK & KA by room.
.6 Catches: Type optional with manufacturer.
.7 Provide other hardware and hardware accessories as detailed or required.
.8 All exposed hardware to have Platinum (Mica) finish by Teknion or equivalent unless noted otherwise.

2.2 Fabrication

.1 Exposed joints and edges:
.1 Uniformly space exposed joints unless otherwise indicated.
.2 No edge grain shall be visible; mitre external corners, house internal fasteners. Glue mitred corners.
.3 All exposed edges of plywood and particle board shall have solid wood edging, pressure glued. AWMAC No. 3 edge.
.4 Ease edges of solid lumber components to 1.6 mm radius.

.2 Mechanical Fasteners:
.1 Inconspicuously locate mechanical fasteners. Wherever possible, conceal fastenings.
.2 Countersink nail heads.
.3 Where exposed to view, countersink screw and bolt heads and fill holes with matching wood plugs.
.4 Cutting and fitting: make cut-outs in work of this Section as required to accommodate work of other Sections.
.5 Make provisions in cabinetwork to accept built-in appliances, provided by others.

.3 Plastic Laminate Components:
.1 Unless otherwise specified herein, comply with requirements of CAN3-A172-M Appendix 'A'.
.2 Assembly: Bond plastic laminate to core with adhesive, under pressure.
.3 Core: unless otherwise indicated: 19 mm thick.
.4 Balanced construction: plastic laminate covered components shall be of balanced construction, with plastic laminate on both faces of core. Seal core edges not covered with plastic laminate.
.5 Use largest practicable plastic laminate sheet size.
.6 Provide joints symmetrically; provide joints as corners and at changes in superficial areas; provide concealed draw bolt anchors and joints. All butt joints shall have a blind spine.

.7 Openings and cut-outs:
.1 Radius internal corners at least 3 mm and chamfer edges.
.2 Where core edge is to remain exposed, cover with plastic laminate edging.
.3 Where core edge is to be concealed, seal with sealer.

2.3 Cabinetwork

.1 Except where otherwise detailed, use flush overlaid construction. Tenon, dado, dowel, or rabbet interior construction with all parts well glued. Shoulder mitre all exposed corners. Open ends or skeleton frames against walls are not permitted.

.2 Construct cabinetwork components of plastic laminate faced particle board or maple veneer plywood as indicated and in accordance with AWMAC Custom grade.

.3 Rout gables for pilaster strips where adjustable shelving is required.

.4 Construct shelving as indicated with edge moulding to match.

.5 Construct doors fronts of 19 mm plastic laminate faced plywood.

.6 Construct doors 19 mm thick with sides tongued into front and back housed into sides.

.7 Install cabinet hardware in accord with hardware manufacturer's directions. Unless otherwise indicated, provide each door with pull and with minimum two hinges. Provide locks where indicated.

.8 Apply moisture repellent sealer to concealed backs of cabinetwork.

.9 Countertops shall be solid surfacing as specified in Section 06 61 16. Coordinate installation and provide all necessary supports.

2.4 Finishes

.1 All exposed exterior and interior surfaces: plastic laminate as indicated. Colours selected by the Consultant.

.2 Wood Finish: 3 coats clear polyurethane finish on all sides as specified in Section 09 91 23. Factory finish wherever practical.

.3 Cabinet and case backs unexposed to view shall be back primed with one coat of moisture repellent sealer.

.4 Apply finishes in accordance with the AWMAC Manual and Section 09 91 23.

PART 3 EXECUTION

3.1 Installation

.1 Verify adequacy of backing and support framing. Advise Contractor of areas and surfaces requiring further modifications for plumb, level, even or square fitting.

.2 Verify HVAC controls and systems are operating properly.

.3 Install work in accordance with AWMAC Installation Manual, Premium grade.

.4 Install cabinetwork components plumb, true and level and securely fasten in place.

.5 Accurately scribe and closely fit components to irregularities of adjacent surfaces.

.6 Accurately fit joints in true plane, locate joints over bearing or supporting surfaces.

.7 Provide mechanical fastening devices such as nails, screws and bolts required for fastening wood components. Provide concealed fastening of components.

.8 Where permitted, nail with small headed finishing nails. Countersink nail heads with nail setter.

.9 Install plastic laminate components using concealed fastening devices.

.10 Where components are fastened with screws or bolts, countersink screw and bolt heads and provide wood plugs matching surrounding wood.

.11 Where cabinetwork abuts other building elements, provide trim matching cabinetwork except where otherwise detailed.

.12 Where access is required to valves and other mechanical and electrical components, located behind cabinetwork, provide removable plywood access panels of size required and secure with four brass screws.

.13 Coordinate installation of solid surfacing countertops with Section 06 61 16.

.14 Apply mildew resistant silicone sealant to perimeter of all countertops as specified in Section 07 92 00.

3.2 Adjustment

.1 Upon completion of installation, inspect work of this Section and touch-up, where required, minor or damaged surface finish to restore it to original condition.

.2 Touch up exposed job made nail and screw holes, raw finishes resulting from job fitting, scratches and mars.

.3 Check operation of all moveable parts and, if necessary, adjust to ensure proper and smooth function.

.4 Replace damaged components which, in the opinion of the Consultant, cannot be satisfactorily repaired.

3.3 Cleaning

.1 Proceed in accordance with Section 01 74 11 – Cleaning.

End of Section

PART 1 GENERAL

1.1 General

.1 Conform to the requirements of Division 1.

1.2 Related Sections

.1 Section 04 22 00 Concrete Unit Masonry
.2 Section 07 92 00 Joint Sealants
.3 Section 09 21 16 Gypsum Board

1.3 References

.1 ASTM International (ASTM)
  .1 ASTM E119-18 Standard Test Methods for Fire Tests of Building Construction and Materials
  .2 ASTM E814-13a (2017) Standard Test Method for Fire Tests of Penetration Firestop Systems.
  .3 ASTM E84-18 Standard Test Method for Surface Burning Characteristics of Building Materials
  .4 ASTM E1966-15 Standard Test Method for Fire-Resistive Joint Systems
  .5 ASTM E 2307-15be1 Standard Test Method for Determining Fire Resistance of Perimeter Fire Barriers Using Intermediate-Scale, Multi-story Test Apparatus
  .6 ASTM E136-16a Standard Test Method for Behavior of Material in a Vertical Tube Furnace at 750° C
.2 Underwriter's Laboratories of Canada (ULC)
  .1 CAN/ULC S101-07, Standard Methods of Fire Endurance Tests of Building Construction and Materials
  .2 CAN/ULC S102.2-10, Method of Test for Surface Burning Characteristics of Flooring, Floor Coverings, and Miscellaneous Materials and Assemblies
  .3 CAN/ULC S115-11, Standard Method of Fire Tests of Firestop Systems
.3 National Fire Protection Association (NFPA)
  .1 NFPA 252 Standard Methods of Fire Test and Door Assemblies
.4 South Coast Air Quality Management District (SCAQMD) California State
  .1 SCAQMD Rule 1168-03: Adhesives and Sealants.
.5 Ontario Building Code

1.4 Submittals

.1 Make submittals in accordance with Section 01 33 00 – Submittal Procedures.

.2 Product Data:
  .1 Submit manufacturer's printed product literature, specifications and datasheet and include product characteristics, performance criteria, physical size, finish and limitations.
  .2 Submit two (2) copies of WHMIS MSDS - Material Safety Data Sheets.

.3 Shop Drawings:
  .1 Submit shop drawings to show location, proposed material, reinforcement, anchorage, fastenings and method of installation.
  .2 Construction details should accurately reflect actual job conditions.

.4 Samples: Submit duplicate 300 x 300 mm samples showing actual fire stop material proposed for project.

.5 Quality Assurance Submittals: submit following in accordance with Section 01 45 00 - Quality Control.
  .1 Test reports: in accordance with CAN/ULC-S101 for fire endurance and CAN/ULC-S102 for

surface burning characteristics.
.2 Submit certified test reports from approved independent testing laboratories, indicating compliance of applied fire stopping with specifications for specified performance characteristics and physical properties.
.3 Certificates: submit certificates signed by manufacturer certifying that materials comply with specified performance characteristics and physical properties.
.4 Manufacturer's Instructions: submit manufacturer's installation instructions and special handling criteria, installation sequence, cleaning procedures.

1.5 Definitions

.1 Fire Stop Material: device intended to close off opening or penetration during fire or materials that fill openings in wall or floor assembly where penetration is by cables, cable trays, conduits, ducts and pipes and poke-through termination devices, including electrical outlet boxes along with their means of support through wall or floor openings.

.2 Single Component Fire Stop System: fire stop material that has Listed Systems Design and is used individually without use of high temperature insulation or other materials to create fire stop system.

.3 Multiple Component Fire Stop System: exact group of fire stop materials that are identified within Listed Systems Design to create on site fire stop system.

1.6 Quality Assurance

.1 One installer shall install all firestopping on the project. Each trade shall not firestop their own service penetrations. Installer shall be certified by fire stopping manufacturer.

.2 Qualifications: Qualified Installer: specializing in fire stopping installations with 5 years documented experience approved and trained by manufacturer.

.3 Pre-Installation Meetings: convene pre-installation meeting one week prior to beginning work of this Section, with contractor's representative and Consultant to:
.1 Verify project requirements.
.2 Review installation and substrate conditions.
.3 Co-ordination with other building subtrades.
.4 Review manufacturer's installation instructions and warranty requirements.

.4 Site Meetings:
.1 As part of Manufacturer's Services described in 3.5- Field Quality Control, schedule site visits, to review Work, at stages listed.
.2 After delivery and storage of products, and when preparatory Work is complete, but before installation begins.
.3 Twice during progress of Work at 25% and 60% complete.
.4 Upon completion of Work, after cleaning is carried out.
.5 Single Source Responsibility: Obtain through-penetration fire-stop systems for each kind of penetration and construction condition indicated from a single manufacturer.

.5 Field-Constructed Mockup: Prior to installing fire-stopping, erect mockups for each different through-penetration fire-stop system indicated to verify selections made and to demonstrate qualities of materials and execution. Build mockups to comply with the following requirements, using materials indicated for final installations.
.1 Locate mockups on site in locations indicated or, if not indicated, as directed by Consultant.
.2 Notify Consultant one (1) week in advance of the dates and times when mockups will be erected.
.3 Obtain Consultant’s acceptance of mockups before start of final unit of Work.
.4 Retain and maintain mockups during construction in an undisturbed condition as a standard

for judging completed unit of Work.

.5 Accepted mockups in an undisturbed condition at time of Substantial Performance may become part of completed unit of Work.

1.7 Sustainable Requirements

.1 Materials shall be Low VOC type conforming to SCAQMD Rule 1168-03. Maximum VOC level of firestopping materials shall be 250 g/l.

1.8 Shipping, Handling and Storage

.1 Refer to Section 01 61 00 – Common Product Requirements.

.2 Deliver, handle and store materials in accordance with manufacturer's printed instructions.

.3 Deliver materials to the site in undamaged condition and in original unopened containers, marked to indicate brand name, manufacturer, ULC markings.

.4 Storage and Protection:
.1 Store materials indoors in dry location and in accordance with manufacturer's recommendations in clean, dry, well-ventilated area.
.2 Replace defective or damaged materials with new.

1.9 Waste Management and Disposal

.1 Refer to Section 01 74 19 – Construction Waste Management and Disposal.

PART 2 PRODUCTS

2.1 Materials

.1 All fire stopping shall consist of ULC listed firestop system.

.2 All firestopping material shall be:
.1 From one manufacturer;
.2 Intumescent where an appropriate system exists.

.3 Fire stopping and smoke seal systems: ULC listed in accordance with CAN/ULC S115.
.1 Asbestos-free materials and systems capable of maintaining effective barrier against flame, smoke and gases in compliance with requirements of CAN/ULC-S115 and not to exceed opening sizes for which they are intended.

.4 Service penetration assemblies: ULC listed systems tested to CAN/ULC-S115.

.5 Service penetration fire stop components: ULC listed and certified by test laboratory to CAN/ULC-S115.

.6 Fire-resistance rating of installed fire stopping assembly in accordance with NBC.

.7 Fire stopping and smoke seals at openings intended for ease of re-entry such as cables: elastomeric seal.

.8 Fire stopping and smoke seals at openings around penetrations for pipes, ductwork and other mechanical items requiring sound and vibration control: elastomeric seal.

.9 Primers: to manufacturer's recommendation for specific material, substrate, and end use.

.10 Water (if applicable): potable, clean and free from injurious amounts of deleterious substances.

.11 Damming and backup materials, supports and anchoring devices: to manufacturer's recommendations, and in accordance with tested assembly being installed as acceptable to authorities having jurisdiction.

.12 Sealants for vertical joints: non-sagging.

.13 General: Provide fire-stopping systems that are produced and installed to resist the spread of fire, according to requirements indicated, and the passage of smoke and other gases.

.14 F-Rated Through-Penetration Fire-stop Systems: Provide through-penetration fire-stop systems with F ratings indicated, but not less than that equaling or exceeding the fire-resistance rating of the constructions penetrated.

.15 T-Rated Through-Penetration Fire-stop Systems: Provide through-penetration fire-stop systems with T ratings, in addition to F ratings, where indicated and where systems protect penetrating items exposed to contact with adjacent materials in occupy-able floor areas. T-rated assemblies are required where the following conditions exist:
- .1 Where fire-stop systems protect penetrations located outside of wall cavities.
- .2 Where fire-stop systems protect penetrations located outside fire-resistive shaft enclosures.
- .3 Where fire-stop systems protect penetrations located in construction containing doors required to have a temperature-rise rating.
- .4 Where fire-stop systems protect penetrating items larger than a 100 mm diameter nominal pipe or 10,000 mm² in overall cross-sectional area.

.16 Fire-Resistive Joint Sealants: Provide joint sealants with fire-resistance ratings indicated, but not less than that equaling or exceeding the fire-resistance rating of the construction in which the joint occurs.

.17 For fire-stopping exposed to view, traffic, moisture, and physical damage, provide products that do not deteriorate when exposed to these conditions.
- .1 For piping penetrations for plumbing and wet-pipe sprinkler systems, provide moisture-resistant through-penetration fire-stop systems.
- .2 For floor penetrations with annular spaces exceeding 100 mm or more in width and exposed to possible loading and traffic, provide fire-stop systems capable of supporting the floor loads involved either by installing floor plates or by other means.
- .3 For penetrations involving insulated piping, provide through-penetration fire-stop systems not requiring removal of insulation.

.18 For firestopping exposed to view, provide products with flame-spread values of less than 25 and smoke-developed values of less than 450.

.19 Compatibility: Provide fire-stopping composed of components that are compatible with each other, the substrates forming openings, and the items, if any, penetrating the firestopping under conditions of service and application, as demonstrated by fire-stopping manufacturer based on testing and field experience.

.20 Accessories: Provide components for each fire-stopping system that are needed to install fill materials and to comply with "System Performance Requirements". Use only components specified by the fire-stopping manufacturer and approved by the qualified testing and inspecting agency for the designated fire resistance-rated systems. Accessories include but are not limited to the following items:
- .1 Permanent forming/damming/backing materials including the following:
  - .1 Semi-refractory fibre (mineral wool) insulation.
  - .2 Ceramic fibre.

.3 Sealants used in combination with other forming/damming materials to prevent leakage of fill materials in liquid state.
.4 Fire-rated formboard.
.5 Joint fillers for joint sealants.
.2 Temporary forming materials.
.3 Substrate primers.
.4 Collars.
.5 Steel sleeves.

.21 Applications: Provide fire-stopping systems composed of materials specified in this Section that comply with system performance and other requirements.

.22 Environmental Conditions: Do not install fire-stopping when ambient or substrate temperatures are outside limits permitted by fire-stopping manufacturers or when substrates are wet due to rain, frost, condensation, or other causes.

.23 Ventilation: Ventilate fire-stopping per fire-stopping manufacturers' instructions by natural means or, where this is inadequate, forced air circulation.

.24 Comply with the requirements of the Workplace Hazardous Materials Information System (WHMIS) regarding use, handling, storage and disposal of hazardous materials and regarding labeling and provision of Material Safety Data Sheets (MSDS).

PART 3 EXECUTION

3.1 Manufacturer’s Instructions

.1 Compliance: comply with manufacturer's written recommendations or specifications.

3.2 Preparation

.1 Examine sizes and conditions of voids to be filled to establish correct thicknesses and installation of materials.

.2 Ensure that substrates and surfaces are clean, dry and frost free.

.3 Prepare surfaces in contact with fire stopping materials and smoke seals to manufacturer's instructions.

.4 Maintain insulation around pipes and ducts penetrating fire separation without interruption to vapour retarder

.5 Mask where necessary to avoid spillage and over coating onto adjoining surfaces; remove stains on adjacent surfaces.

3.3 Installation

.1 Install fire stopping and smoke seal material and components in accordance with manufacturer's certified tested system listing and as necessary to maintain fire resistance ratings of floor and wall assemblies.

.2 Provide fire stopping for all disciplines.

.3 Seal holes or voids made by through penetrations, poke-through termination devices, and unpenetrated openings or joints to ensure continuity and integrity of fire separation are maintained.

.4 Fill spaces between openings, ducts, pipes and unused sleeves passing through fire separations with firestop material and install firestopping systems in accordance with the appropriate ULC system number for the products and type of penetration.

.5 Provide temporary forming as required and remove forming only after materials have gained sufficient strength and after initial curing.

.6 Tool or trowel exposed surfaces to neat finish.

.7 Remove excess compound promptly as work progresses and upon completion.

3.4 Sequences of Operation

.1 Proceed only when submittals have been reviewed by Consultant.

.2 Mechanical pipe insulation: certified fire stop system component.
.1 Ensure pipe insulation installation precedes fire stopping.

3.5 Field Quality Control

.1 Inspections: notify Consultant when ready for inspection and prior to concealing or enclosing fire stopping materials and service penetration assemblies.

.2 Employ a ULC accredited Designated Responsible Individual (DRI) to inspect and label all fire stop applications on site.

.3 Manufacturer's Field Services:
.1 Obtain written report from manufacturer verifying compliance of Work, in handling, installing, applying, protecting and cleaning of product and submit Manufacturer's Field Reports as described in Part 1.4 - Submittals.
.2 Provide manufacturer's field services consisting of product use recommendations and periodic site visits for inspection of product installation in accordance with manufacturer's instructions.
.3 Schedule site visits, to review Work, as directed in Part 1.6 - Quality Assurance.

3.6 Commissioning

.1 Employ a ULC accredited Designated Responsible Individual (DRI) to inspect and label all fire stop applications on site. Submit DRI's written reports within 3 days of review, verifying compliance of Work.

.2 Perform a thorough examination of the fire stopping system to determine if the assembly is installed as per its ULC listing.
.3 Allow for destructive testing of installed firestopping. Repair all tested assemblies.

.4 The examination shall take place prior to close-up to confirm assembly components and installation configuration.

.5 Any and all deviations from the ULC listed system shall be considered grounds for rejection and replacement.

3.7 Schedule

.1 Fire stop and smoke seal at:
.1 Penetrations through fire-resistance rated concrete, masonry, and gypsum board partitions

and walls.
.2 Top of fire-resistance rated partitions.
.3 Intersection of fire-resistance rated partitions.
.4 Control and sway joints in fire-resistance rated partitions and walls.
.5 Penetrations through fire-resistance rated floor slabs, ceilings and roofs.
.6 Around mechanical and electrical assemblies penetrating fire separations.
.7 Rigid ducts: greater than 129 cm²: fire stopping to consist of bead of fire stopping material between retaining angle and fire separation and between retaining angle and duct, on each side of fire separation.
.8 All electrical outlet boxes installed in fire rated gypsum board assemblies.
.9 All locations required by the Ontario Building Code.
.10 Any other locations indicated.

3.8 Cleaning

.1 Proceed in accordance with Section 01 74 11 – Cleaning.

.2 On completion and verification of performance of installation, remove surplus materials, excess materials, rubbish, tools and equipment.

.3 Remove temporary dams after initial set of fire stopping and smoke seal materials.

End of Section

PART 1 GENERAL

1.1 General

.1 Conform to the requirements of Division 1.

1.2 Related Sections

.1 Section 03 30 00 Cast-in-Place Concrete
.2 Section 04 22 00 Concrete Unit Masonry
.3 Section 06 20 00 Finish Carpentry
.4 Section 06 40 00 Architectural Woodwork
.5 Section 06 61 16 Solid Surfacing
.6 Section 07 84 00 Firestopping
.7 Section 08 11 00 Hollow Metal Doors and Fames
.8 Section 08 50 00 Aluminum Doors, Windows and Screens
.9 Section 08 80 05 Glazing
.10

1.3 References

.1 ASTM International (ASTM)
  .1 ASTM C834-17 Standard Specification for Latex Sealants
  .2 ASTM C920-14a Standard Specification for Elastomeric Joint Sealants
  .3 ASTM C1193-16 Standard Guide for Use of Joint Sealants
  .4 ASTM C1311-14 Standard Specification for Solvent Release Sealants
.2 Canadian General Standards Board (CGSB)
  .1 CGSB 19-GP-5M-1984, Sealing compound, one component, acrylic base, solvent curing.
  .2 CGSB 19.13-M87, Sealing compound, one component, elastomeric chemical curing.
  .3 CGSB 19-GP-14M-1984 Sealing compound, one component, butyl-polyisobutylene, polymer base, solvent curing.
  .4 CAN/CGSB-19.17-M90, One-Component Acrylic Emulsion Base Sealing Compound.
  .5 CAN/CGSB-19.24-M90, Multi component, chemical curing sealing compound.
.3 South Coast Air Quality Management District (SCAQMD) California State
  .1 SCAQMD Rule 1168-03: Adhesives and Sealants.

1.4 Submittals

.1 Make submittals in accordance with Section 01 33 00 – Submittal Procedures.

.2 Submit product data for all sealant materials and accessories.

.3 Submit MSDS Data Sheets for review and acceptance by the Owner prior to delivery to the project site. Obtain written approval from the Owner and do not deliver any materials to the Owner's property, prior to receipt of such approval.

1.5 Quality Assurance

.1 Installation of caulking shall be performed only by workmen thoroughly skilled and specially trained in the techniques of caulking.

.2 Caulking work shall be carried out in strict accordance with manufacturer's printed directions.

1.6 Shipping, Handling and Storage

.1 Refer to Section 01 61 00 – Common Product Requirements.

.2 Deliver, handle and store materials in accordance with manufacturer's printed instructions.

.3 Use all means necessary to protect caulking materials before, during and after installation and to protect the installed work and materials of all other trades.

.4 In the event of damage, immediately make all repairs and replacements necessary to the approval of the Consultant and at no additional cost to the Owner.

.5 Store all caulking materials and equipment under conditions recommended by its manufacturer.

.6 Do not use materials stored for a period exceeding the maximum recommended shelf-life of the material.

.7 Materials shall be delivered to the job in their original containers or wrapping with the manufacturer's seal and labels intact.

1.7 Environmental Considerations

.1 Comply with requirements of Workplace Hazardous Materials Information System (WHMIS) regarding use, handling, storage, and disposal of hazardous materials, and regarding labelling and provision of material safety data sheets.

.2 Conform to manufacturer's recommended temperatures, relative humidity, and substrate moisture content for application and curing of sealants including special conditions governing use.

.3 Ventilate area of work by use of approved portable supply and exhaust fans.

1.8 Waste Management and Disposal

.1 Refer to Section 01 74 19 – Construction Waste Management and Disposal.

1.9 Warranty

.1 Warrant the work of this Section against defects of workmanship and material, for a period of three (3) years from the date of Substantial Performance and agree to make good promptly any defects which occur or become apparent within the warranty period.

PART 2 PRODUCTS

2.1 Manufacturer

.1 Products of the following manufacturers are approved for use subject to meeting the specifications for the particular product listed below:
   .1 Canadian General Electric
   .2 Dow Corning
   .3 Nuco Inc.
   .4 Sika Canada Limited
   .5 Tremco Manufacturing Company (Canada) Ltd.
   .6 W.R. Grace and Company.
   .7 CR Laurence.

2.2 Materials

.1 Primers: Type recommended by sealant manufacturer. Low VOC type

.2 Joint Fillers:
- .1 General: Compatible with primers and sealants, outsized 30 to 50%.
- .2 Vertical Joints: Polyethylene, Urethane, Neoprene or Vinyl:
  - .1 Extruded closed cell foam, Shore A hardness 20, tensile strength 140 to 200 kPa.
  - .2 Sealtight-Etha Foam Backer Rod, W. R. Meadows Canada Ltd.
- .3 Horizontal Joints: Neoprene or Butyl Rubber (Horizontal Joints): Round solid rod, Shore A hardness 70.
- .4 Premoulded Joint Filler: Unifoam R1009, Goodco Limited

.3 Sealants:
- .1 All sealants shall be Low VOC Type.
- .2 Colour of sealants to be selected by Consultant.
- .3 For Interior Locations:
  - .1 Moving joints:
    - .1 Low modulus, high performance, one-component, polyurethane-based, non-sag elastomeric sealant.
      - .1 Sikaflex 15LM
  - .2 Non-moving Joints
    - .1 To CAN3-11.13-M, one component polysulphide base sealant bearing seal of approval of Thiokol Chemical Corporation.
      - .1 Vulkem 116 – Tremco
      - .2 Mono 555
  - .3 Acrylic Latex: Siliconized acrylic latex to ASTM C834.
    - .1 Tremflex 834 - Tremco
  - .4 Mildew Resistant Sealant: Silicone to ASTM C920.

.4 Bond Breaker Tape: Polyethylene bond breaker tape which will not bond to sealant.

.5 Joint Cleaner: Xylol, methylethyleketon or non-corrosive type recommended by sealant manufacturer and compatible with joint forming materials.

PART 3 EXECUTION

3.1 Inspection

.1 Inspect conditions and substrates upon which work of this Section is dependent. Report to Consultant in writing any defects that may jeopardize the performance of this work.

.2 Commencement of work implies acceptance of conditions.

3.2 Preparation

.1 Remove dust, paint, loose mortar and other foreign matter. Ensure joint surfaces are dry and free of frost.

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

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

.4 Do not apply sealants to joint surfaces treated with sealer, curing compound, water repellent, or other coatings unless tests have been performed to ensure compatibility of materials. Remove coatings as required.

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

.6 Examine joint sizes and conditions to achieve correct depth ratio ½ of joint width with minimum width and depth of 6 mm, maximum width 25 mm.

.7 Install joint filler to achieve correct joint depth.

.8 Where necessary to prevent staining, mask adjacent surface prior to priming and caulking.

.9 Apply bond breaker tape where required to ensure performance of sealant.

.10 Prime sides of joints when required and as recommended by sealant manufacturer to ensure performance of sealant immediately prior to caulking.

3.3 Application

.1 Apply sealants in accordance with manufacturer's instructions, in continuous beads, to provide watertight joint. Apply sealant using gun with proper size nozzle. Use sufficient pressure to fill voids and joints solid. Superficial pointing with skin bead is not acceptable.

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

.3 Clean adjacent surfaces immediately and leave work neat and clean. Remove excess sealant and droppings using recommended cleaners as work progresses. Remove masking after tooling of joints.

.4 Apply sealant to joints between window or door frames to adjacent building components, around perimeter of every external opening, to control joints in masonry walls where shown.

.5 Caulk joints in surfaces to be painted before surfaces are painted. Where surfaces to be caulked are primed in shop before caulking, check to make sure prime paint and caulking are compatible. If they are incompatible, inform Consultant and change caulking to compatible type approved by Consultant.

3.4 Schedule

.1 Provide sealants at the following locations
- .1 Where required to protect interior from exterior air and water infiltration.
- .2 Joints between all dissimilar materials.
- .3 Construction and control joints.
- .4 At intersecting masonry wall.
- .5 Joints in metal frames.
- .6 Base of metal frames at resilient flooring.
- .7 Joints in ceramic tile.
- .8 Window and door frames (inside and outside).
- .9 Junction of toilet fixtures with walls and floors (mildew resistant).
- .10 Junction between vanities and walls or backsplashes (mildew resistant).
- .11 Joints between cabinetwork and adjoining surfaces (mildew resistant latex, white).

.12 Perimeter of all mechanical and electrical material or piping and other service penetrations in interior and exterior walls and partitions where not required to be firestopped.
.13 Other locations where caulking or sealant is required to provide a neat clean junction

3.5 Cleaning

.1 Proceed in accordance with Section 01 74 11 – Cleaning.

End of Section

PART 1 GENERAL

1.1 General

.1 Conform to the requirements of Division 1.

1.2 Related Sections

.1	Section 04 22 00	Masonry
.2	Section 06 10 00	Rough Carpentry
.3	Section 07 92 00	Joint Sealants
.4	Section 08 11 19	Stainless Steel Doors and Frames
.5	Section 08 71 10	Door Hardware
.6	Section 08 80 05	Glazing
.7	Section 09 91 23	Interior Painting

1.3 References

.1 ASTM International (ASTM)
  .1 ASTM A653/A653M-11, Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process.
  .2 ASTM B29-14 Standard Specification for Refined Lead
  .3 ASTM B749-14 Standard Specification for Lead and Lead Alloy Strip, Sheet and Plate Products.
  .4 ASTM E90-09 (2016) Standard Test Method for Laboratory Measurement of Airborne Sound Transmission Loss of Building Partitions and Elements.
  .5 ASTM E413-16 Classification for Rating Sound Insulation.
.2 Canadian General Standards Board (CGSB)
  .1 CAN/CGSB-1.181-99, Ready-Mixed Organic Zinc-Rich Coating.
.3 Canadian Standards Association (CSA International)
  .1 CSA-G40.20-04/G40.21-04 (R2009), General Requirements for Rolled or Welded Structural Quality Steel/Structural Quality Steel.
  .2 CSA W59-03 (R2008), Welded Steel Construction (Metal Arc Welding).
.4 Canadian Steel Door Manufacturers' Association (CSDMA)
  .1 CSDMA, Recommended Specifications for Commercial Steel Doors and Frames, 2000.
  .2 CSDMA, Selection and Usage Guide for Commercial Steel Doors, 1990.

1.4 Submittals

.1 Make submittals in accordance with Section 01 33 00 – Submittal Procedures.

.2 Provide shop drawings:
  .1 Indicate each type of door, material, steel core thicknesses, mortises, reinforcements, location of exposed fasteners, arrangement of hardware, and finishes.
  .2 Indicate each type frame material, core thickness, reinforcements, location of anchors and exposed fastenings, reinforcing, fire rating and finishes.
  .3 Include schedule identifying each unit, with door marks and numbers relating to numbering on drawings and door schedule.

1.5 Shipping, Handling and Storage

.1 Refer to Section 01 61 00 – Common Product Requirements.

.2 Deliver, handle and store materials in accordance with manufacturer's printed instructions.

1.6 Requirements of Regulatory Agencies

.1 Steel fire rated doors and frames: labeled and installed by an organization accredited by Standards Council of Canada in conformance with CAN4-S104M (NFPA 252) for ratings specified or indicated.

.2 Provide fire labeled frame products for those openings requiring fire protection ratings, as scheduled. Test products in strict conformance with CAN4-S104, ASTM E 152 or NFPA 252 and list by nationally recognized agency having factory inspection service and construct as detailed in Follow-up Service Procedures/Factory Inspection Manuals issued by listing agency to individual manufacturers.

1.7 Testing and Performance

.1 Fire labeled products shall be provided for those openings requiring fire protection ratings as scheduled on the drawings. Products shall be tested in strict conformance with CAN4-S104 and listed by Underwriters Laboratory of Canada Ltd. or Warnock Hersey under an active Factory Inspection Program.

.2 Product quality shall meet the standards established by the Canadian Steel Door Manufacturer's Association.

.3 Door construction shall meet acceptance criteria of ANSI A224.1 and shall be certified as meeting Level A (1,000,000 cycles) and Twist Test Acceptance Criteria deflection not to exceed 6.4 mm/13.6 kg force, total deflection at 136.1 kg force not to exceed 64 mm and permanent deflection not to exceed 3.0 mm when tested in strict conformance with ANSI A250.4. Test shall be conducted by an independent nationally recognized accredited laboratory.

1.8 Waste Management and Disposal

.1 Refer to Section 01 74 19 – Construction Waste Management and Disposal.

PART 2 PRODUCTS

2.1 Materials

.1 Hot dipped galvanized steel sheet: to ASTM A 653M, ZF75, minimum base steel thickness in accordance with CSDMA Table 1 - Thickness for Component Parts.

.2 Reinforcement channel: to CSA G40.20/G40.21, Type 44W, coating designation to ASTM A 653M, ZF75.

2.2 Door Core Material

.1 Structural small cell, 24.5mm maximum kraft paper 'honeycomb', weight 36.3 kg per ream minimum, density: 16.5 kg/m³ minimum sanded to required thickness. ULC approved.

2.3 Primer

.1 Touch-up prime CAN/CGSB-1.181, organic zinc rich, rust inhibitive.
.1 Maximum VOC limit 50 g/L to GC-03.

2.4 Adhesives

.1 Adhesive: maximum VOC content 50 g/L to SCAQMD Rule 1168.

.2 Honeycomb cores and steel components: heat resistant, spray grade, resin reinforced neoprene/rubber (polychloroprene) based, low viscosity, contact cement.

2.5 Accessories

.1 Glazing Stops: Minimum 20 gauge (0.9 mm) base thickness sheet steel with wipe zinc finish to ASTM A525-80a. Fasteners to be #6 x 32 mm cadmium plated oval head scrulox (self-drilling) type screws. Tamper proof screws.

.2 Door silencers: single stud rubber/neoprene type, to CGSB-60-GP6 Type 6/180.

.3 Metallic paste filler: to manufacturer's standard.

.4 Sealant: As specified in Section 07 92 00.

.5 Fiberglass: to CAN/ULC-S702-09-AM1, loose batt type, minimum density of 24 kg/m³.

2.6 Frame Fabrication- General

.1 Fabricate frames in accordance with CSDMA specifications.

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

.3 Frames: 1.6 mm welded type construction.

.4 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.

.5 Protect mortised cutouts with steel guard boxes.

.6 Prepare frame for door silencers, 3 for single door, 2 at head for double door.

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

.8 Conceal fastenings except where exposed fastenings are indicated.

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

.10 Prepare frames to receive electrical conduit for door operators where indicated and required.

2.7 Frame Anchorage

.1 Provide appropriate anchorage to floor and wall construction.

.2 Locate each wall anchor immediately above or below each hinge reinforcement on hinge jamb and directly opposite on strike jamb.

.3 Provide 2 anchors for rebate opening heights up to 1520 mm and 1 additional anchor for each additional 760 mm of height or fraction thereof.

.4 Locate anchors for frames in existing openings not more than 150 mm from top and bottom of each jambs and intermediate at 660 mm on centre maximum.

2.8 Frames – Welded Type

.1 Welding in accordance with CSA W59.

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

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

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

.5 Weld in 2 temporary jamb spreaders per frame to maintain proper alignment during shipment.

2.9 Door Fabrication - General

.1 Doors: swing type, flush.

.2 Form face sheets for interior doors from 1.2 sheet steel.

.3 Reinforce doors with vertical stiffeners, securely welded to face sheets at 150 mm on centre maximum.

.4 Fill voids between stiffeners of interior doors with temperature rise rated core

.5 All doors: insulated steel construction with honeycomb core laminated to face sheets under pressure.

.6 Seams: visible grind welded joints to a flat plane, fill with metallic paste filler and sand to a uniform smooth finish.

.7 Doors: manufacturers' proprietary construction, tested and/or engineered as part of a fully operable assembly, including door, frame, gasketting and hardware in accordance with ASTM E330.

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

.9 Factory prepare holes 12.7 mm diameter and larger except mounting and through-bolt holes, on site, at time of hardware installation.

.10 Reinforce doors where required, for surface mounted hardware.

.11 Provide inverted, recessed, spot welded channels to top and bottom of interior doors.

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

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

2.10 Glazing Stops

.1 Glazing stops shall be accurately fitted, butted at corners with removable stops located on push side of door.

.2 Provide tamper proof screws on all doors and screens.

2.11 Finishes

.1 Doors and frames shall wipe coat zinc, ready for painting.

PART 3 EXECUTION

3.1 Manufacturer's Instructions

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

3.2 Installation – General

.1 Install doors and frames to CSDMA Installation Guide.

3.3 Frame Installation

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

.2 Secure anchorages and connections to adjacent construction.

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

.4 Brace frames rigidly in position while building-in. Install temporary horizontal wood spreader at third points of door opening to maintain frame width. Remove temporary spreaders after frames are built-in.

.5 Caulk perimeter of frames.

3.4 Door Installation

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

.2 Provide even margins between doors and jambs and doors and finished floor and thresholds as follows:
   .1 Hinge side: 1.0 mm.
   .2 Latchside and head: 1.5 mm.
   .3 Finished floor and thresholds: 13 mm.
   .4 Adjust operable parts for correct function.

.3 Coordinate with Section 08 71 10 for preparation and installation of automatic door operators.

3.5 Finish Repairs

.1 Touch up with primer finishes damaged during installation.

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

3.6 Cleaning

.1 Proceed in accordance with Section 01 74 11 – Cleaning.

End of Section

PART 1 GENERAL

1.1 General

.1 Conform to the requirements of Division 1.

1.2 Related Sections

.1 Section 06 20 00 Finish Carpentry
.2 Section 08 11 00 Metal Doors and Frames

1.3 References

.1 American National Standards Institute (ANSI) / Builders Hardware Manufacturers Association (BHMA)
  .1 ANSI/DHI A115.1G-1994, Installation Guide for Doors and Hardware
  .2 ANSI/BHMA A156.1-2013, American National Standard for Butts and Hinges.
  .3 ANSI/BHMA A156.2-2011, Bored and Preassembled Locks and Latches.
  .4 ANSI/BHMA A156.3-2014, Exit Devices.
  .5 ANSI/BHMA A156.4-2013, Door Controls - Closers.
  .6 ANSI/BHMA A156.6-2010, Architectural Door Trim.
  .7 ANSI/BHMA A156.8-2010, Door Controls - Overhead Stops and Holders.
  .8 ANSI/BHMA A156.10-2011, Power Operated Pedestrian Doors.
  .9 ANSI/BHMA A156.13-2012, Mortise Locks and Latches Series 1000.
  .10 ANSI/BHMA A156.15-2011, Release Devices - Closer Holder, Electromagnetic and Electromechanical.
  .11 ANSI/BHMA A156.16-2013, Auxiliary Hardware.
  .12 ANSI/BHMA A156.17-2014, Self-closing Hinges and Pivots.
  .13 ANSI/BHMA A156.18-2012, Materials and Finishes.
  .14 ANSI/BHMA A156.19-2013, Power Assist and Low Energy Power - Operated Doors.
.2 Canadian Steel Door and Frame Manufacturers' Association (CSDFMA).
  .1 CSDFMA Canadian Metric Guide for Steel Doors and Frames (Modular Construction): standard hardware location dimensions.
.3 Accessibility for Ontarians with Disabilities Act (AODA)

1.4 Submittals

.1 Make submittals in accordance with Section 01 33 00 – Submittal Procedures.

.2 Product Data:
  .1 Submit manufacturer's product literature, specifications and data sheets.

.3 Samples:
  .1 Identify each sample by label indicating applicable specification paragraph number, brand name and number, finish and hardware package number.
  .2 After approval samples will be returned for incorporation in the Work.

.4 Hardware List:
  .1 Submit contract hardware list.
  .2 Indicate specified hardware, including make, model, material, function, size, finish and other pertinent information.

.5 Manufacturer's Instructions:
.1 Submit manufacturer's installation instructions.

.6 Closeout Submittals
.1 Provide operation and maintenance data for door closers, locksets, door holders, electrified hardware and fire exit hardware for incorporation into Operations and Maintenance manuals specified in Section 01 78 00 - Closeout Submittals.

1.5 Quality Assurance

.1 Regulatory Requirements:
.1 Hardware for doors in fire separations and exit doors certified by a Canadian Certification Organization accredited by Standards Council of Canada.
.2 Test Reports: certified test reports showing compliance with specified performance characteristics and physical properties.
.3 Certificates: product certificates signed by manufacturer certifying materials comply with specified performance characteristics and criteria and physical requirements.

.2 Pre-installation Meetings: conduct pre-installation meeting to verify project requirements, manufacturer's installation instructions and manufacturer's warranty requirements.

1.6 Shipping, Handling and Storage

.1 Refer to Section 01 61 00 – Common Product Requirements.

.2 Deliver, handle and store materials in accordance with manufacturer’s printed instructions.

.3 Package each item of hardware including fastenings, separately or in like groups of hardware, label each package as to item definition and location.

.4 Receive the delivery of the Finishing Hardware and identify all items against the Finishing Hardware Schedule. Ensure each hardware item is accompanied by the correct template, installation instructions, special tools, fastening devices and other loose items. Advise the finish hardware supplier and Consultant in writing of errors or omissions.

.5 Storage and Protection: Store finishing hardware in locked, clean and dry area.

.6 Remove all hardware from doors and frames prior to painting. After painting is complete and dry, reinstall all hardware to manufacturer’s recommendations.

1.7 Waste Management and Disposal

.1 Refer to Section 01 74 19 – Construction Waste Management and Disposal.

1.8 Maintenance

.1 Provide maintenance materials in accordance with Section 01 78 00 – Closeout Submittals.

1.9 Warranty

.1 Warrant all hardware against defects of workmanship and material, for a period of one year, except for door closers which shall be warranted for ten (10) years from the date of Substantial Performance and agree to make good promptly any defects which occur or become apparent within the warranty period.

PART 2 PRODUCTS

2.1 Materials

.1 All hardware shall be supplied as specified in the Finishing Hardware Schedule.

.2 All finishes shall be as indicated in the Finishing Hardware Schedule by international codes and in accordance with ANSI/BHMA A156.18.

.2 All door handles shall be lever type meeting requirements of the Ontario Building Code.

2.2 Fastenings

.1 Use only fasteners provided by manufacturer. Failure to comply may void warranties and applicable licensed labels.

.2 Supply screws, bolts, expansion shields and other fastening devices required for satisfactory installation and operation of hardware.

.3 Exposed fastening devices to match finish of hardware.

.4 Where pull is scheduled on one side of door and push plate on other side, supply fastening devices, and install so pull can be secured through door from reverse side. Install push plate to cover fasteners.

.5 Use fasteners compatible with material through which they pass.

2.3 Keying

.1 New buildings locksets must be by one manufacturer and the master key system documentation must be supplied as part of the Operations and Maintenance manual specified in Section 01 78 00.

.2 Keying shall be to Owners Master Key system.

.3 Provide construction cores which will be removed at Substantial Performance.

PART 3 EXECUTION

3.1 Manufacturer’s Instructions

.1 Compliance: comply with manufacturer's written data, including product technical bulletins, product catalogue installation instructions, product carton installation instructions, and data sheets.

.2 Furnish metal door and frame manufacturers with complete instructions and templates for preparation of their work to receive hardware.

.3 Furnish manufacturers' instructions for proper installation of each hardware component.

3.2 Examination

.1 Before installing any hardware, carefully check all architectural drawings of the work requiring hardware, verify door swings, door and frame materials and operating conditions, and assure that all hardware will fit the work to which it is to be attached.

.2 Check all shop drawings and frame and door lists affecting hardware type and installation, and certify to the correctness thereof, or advise the hardware supplier and Consultant in writing of required revisions.

3.3 Templates

.1 Check the hardware schedule, drawings and specifications, and furnish promptly to the applicable trades any patterns, templates, template information and manufacturer's literature required for the proper preparation for and application of hardware, in ample time to facilitate the progress of the work.

3.4 Installation

.1 Install hardware to standard hardware location dimensions in accordance with Canadian Metric Guide for Steel Doors and Frames (Modular Construction) prepared by Canadian Steel Door and Frame Manufacturers' Association.

.2 Installation of hardware shall be in accordance with ANSI A115.1G, manufacturer’s templates and instructions.

.3 Coordinate installation of electric door strikes, keypad locks, card readers, washroom duress systems, and other electronic door control and security devices with Electrical contractor including supply and installation of wiring and all terminations.

.4 All hardware shall be installed by carpenters, skilled in the application of architectural hardware and satisfactory to the hardware supplier. Refer to Section 06 20 00 - Finish Carpentry. Instruction sheets, details and templates shall be read and understood before installation.

.5 Install all materials as listed in the Finishing Hardware Schedule on the doors and frames listed. Interchanging of hardware will not be allowed.

.6 Use only manufacturer's supplied fasteners. Failure to comply may void manufacturer's warranties and applicable licensed labels. Use of "quick" type fasteners, unless specifically supplied by manufacturer, is unacceptable.

.7 Where door stop contacts door pulls, mount stop to strike bottom of pull.

.8 Remove construction cores when directed by Owner’s Representative.

.9 After installation, templates, installation instructions and details shall be put in a file and turned over to the Owner, when building is Substantially Performed.

3.5 Adjusting

.1 Adjust door hardware, operators, closures and controls for optimum, smooth operating condition, safety and for weather tight closure.

.2 Lubricate hardware, operating equipment and other moving parts.

.3 Adjust door hardware to provide tight fit at contact points with frames.

3.6 Inspection

.1 After installation of all hardware and before building is accepted, inspect the installation of all hardware and certify in writing to the Consultant that the hardware is properly installed and supplied in accordance with the manufacturer's recommendations, and finishing hardware schedule.

3.7 Cleaning

.1 Proceed in accordance with Section 01 74 11 – Cleaning.

.2 Perform cleaning after installation to remove construction and accumulated environmental dirt.

.3 Clean hardware with damp rag and approved non-abrasive cleaner, and polish hardware in accordance with manufacturer's instructions.

.4 Remove protective material from hardware items where present.

3.8 Demonstration

.1 Maintenance Staff Briefing:
  .1 Brief maintenance staff regarding:
    .1 Proper care, cleaning, and general maintenance of projects complete hardware.
    .2 Description, use, handling, and storage of keys.
    .3 Use, application and storage of wrenches.

.2 Demonstrate operation, operating components, adjustment features, and lubrication requirements.

End of Section

PART 1 GENERAL

1.1 General

.1 Conform to the requirements of Division 1.

1.2 Related Sections

.1	Section 07 92 00	Joint Sealants
.2	Section 08 11 00	Metal Doors and Frames
.3	Section 08 50 00	Aluminum Doors, Windows and Screens
.4	Section 08 87 20	Decorative Window Films
.5	Section 08 88 13	Fire Resistant Glazing
.6	Section 10 28 10	Toilet and Bath Accessories

1.3 References

.1 ASTM International (ASTM).
  .1 ASTM C162-05 (2015), Standard Terminology of Glass and Glass Products.
  .2 ASTM C542-05(2017) Standard Specification for Lock-Strip Gaskets
  .3 ASTM C1048-12e1 Standard Specification for Heat-Strengthened and Fully Tempered Flat Glass
  .4 ASTM C1376-15 Standard Specification for Pyrolytic and Vacuum Deposition Coatings on Flat Glass
  .5 ASTM C1503-08(2013) Standard Specification for Silvered Flat Glass Mirrors
  .6 ASTM D790-17 Standard Test Methods for Flexural Properties of Unreinforced and Reinforced Plastics and Electrical Insulating Materials
  .7 ASTM D1929-16 Standard Test Method for Determining Ignition Temperature of Plastics
  .8 ASTM D2240-15 Standard Test Method for Rubber Property—Durometer Hardness
  .9 ASTM E84-17 Standard Test Method for Surface Burning Characteristics of Building Materials
.2 American National Standards Institute (ANSI).
  .1 ANSI Z97.1 American National Standard for Glazing Materials Used in Buildings - Safety Performance Specifications and Methods of Test.
.3 Canadian General Standards Board (CGSB).
  .1 CAN/CGSB-12.1-M90 Tempered or Laminated Safety Glass.
.4 Consumer Product Safety Commission
  .1 CPSC 16 CFR 1201 Safety Standard for Architectural Glazing Materials.
.5 Environmental Choice Program (ECP).
  .1 CCD-045-95, Sealants and Caulking.
.6 Flat Glass Manufacturers Association (FGMA).
  .1 FGMA Glazing Manual - 1990.
.7 Glass Association of North America (GANA)
  .1 GANA Glazing Manual 50th Anniversary Edition-2008.
  .2 GANA Laminated Glazing Reference Manual - 2009.
  .3 GANA Sealant Manual-2008.
  .4 GANA Laminated Glazing Reference Manual (2009).
  .5 GANA Guide to Architectural Glass (2010).
  .6 GANA/PGC International Protective Glazing Manual (2010).
.8 South Coast Air Quality Management District, California State (SCAQMD)
  .1 SCAQMD Rule 1168-03, Adhesives and Sealants Applications.

1.4 Submittals

.1 Make submittals in accordance with Section 01 33 00 – Submittal Procedures.

.2 Product Data: Submit manufacturer's printed product literature, specifications and data sheets.

.3 Certificates: submit product certificates signed by manufacturer certifying materials and assemblies comply with specified performance characteristics and criteria and physical requirements.

.4 Test Reports: certified test reports showing compliance with specified performance characteristics and physical properties.

.5 Samples: Submit duplicate 300 x 300 mm size samples of glass and sealant material.

.6 Manufacturer's Instructions: Submit manufacturer's installation instructions.

.7 Closeout Submittals: Provide maintenance data including cleaning instructions for incorporation into manual specified in Section 01 78 00 - Closeout Submittals.

1.5 Quality Assurance

.1 Perform work in accordance with FGMA Glazing Manual and Laminators Safety Glass Association Standards Manual for glazing installation methods.

.2 Installer: Company specializing in the installation of structural glazing with five (5) years proven experience and approved by the manufacturer for installation of their products.

.3 Safety glass products shall comply with the testing requirements of CAN/CGSB-12.1-M, Type 1 for Laminated Glass and Type 2 for Tempered Glass.

.4 Comply with published recommendations of glass product manufacturers and organizations below, except where more stringent requirements are indicated. Refer to these publications for glazing terms not otherwise defined in this section or referenced standards.
.1 GANA Publications
.2 AAMA Publications
.3 IGMA/IGMAC Publications

.5 Provide safety glass permanently marked with the company name or logo and CAN/CGSB-12.1-M if the product meets categories 1 and 2, or mark as CAN/CGSB 12.1-M-1 if the product meets the requirements of Category 1 only.

.6 Single-source fabrication responsibility: All glass fabricated for each type shall be processed and supplied by a single fabricator.

.7 Test Reports: certified test reports showing compliance with specified performance characteristics and physical properties.

.8 Certificates: product certificates signed by manufacturer certifying materials comply with specified performance characteristics and criteria and physical requirements.

1.6 Design Requirements

.1 Design glass, glazing channels, connections, attachments and glazing accessories to withstand loads designated by the Ontario Building Code and to accommodate all building deflections.

.2 Limit glass deflection to 1/200 with full recovery of glazing materials.

.3 Glass thicknesses indicated are minimum and are for detailing only. Confirm glass thickness by analyzing project conditions, including in-service conditions and loads. Coordinate glass thicknesses with manufacturers of framing systems.

1.7 Environmental Requirements

.1 Install glazing when ambient temperature is 10° C minimum. Maintain ventilated environment for 24 hours after application.

.2 Maintain minimum ambient temperature before, during and for 24 hours after installation of glazing compounds.

1.8 Shipping, Handling and Storage

.1 Refer to Section 01 61 00 – Common Product Requirements.

.2 Deliver, handle and store materials in accordance with manufacturer's printed instructions.

.3 Provide glass units with interleaving protection between lites. Keep glass and interleaving dry and store cases in clean, cool, dry areas with temperatures above the dew point. Circulation of cool, dry air in storage areas is essential. Open cases and inspect units periodically for moisture accumulation.

.4 Do not store glass in direct sunlight without an opaque protective covering over same.

1.9 Waste Management and Disposal

.1 Refer to Section 01 74 19 – Construction Waste Management and Disposal.

1.10 Warranty

.1 Warrant the work of this Section against defects of workmanship and material, for a period of ten (10) years from the date of Substantial Performance and agree to make good promptly any defects which occur or become apparent within the warranty period.

.2 Warrant laminated glass for ten (10) years against delamination and discoloration.

Part 2 Products

2.1 Materials-Flat Glass

.1 Impact Resistant Laminated Glass (where required and as referred to as "i.r. glass"): laminated glass to CAN/CGSB-12.1-M with 0.060 mm polyvinyl butyral (PVB) interlayer between two 6.0 mm layers of heat strengthened glass.

.2 Tempered Safety Glass: To CAN/CGSB-12.1-M, transparent, thickness as indicated on drawings. Type 2-tempered.
  .1 Class B-float.
  .2 Category 1 11.
  .3 Edge treatment: ground, bevel edge.

.3 Mirror Glass: Silvered mirror glass: to ASTM C1503, minimum 6 mm thick.
  .1 Type 1B-Float glass for high humidity use. All edges ground and polished.

2.2 Fire Rated Glass

.1 As specified in Section 08 88 13

2.3 Window Film

.1 As specified in Section 08 87 20.

2.4 Glazing Products

.1 Select appropriate glazing sealants, tapes, gaskets and other glazing materials of proven compatibility with other materials that they contact. These include glass products, insulating glass unit seals and glazing channel substrates under installation and service conditions, as demonstrated by testing and field experience.

.2 Setting blocks: Neoprene 80-90 Shore A durometer hardness to ASTM D 2240, to suit glazing method, glass light weight and area.

.3 Spacer shims: Neoprene 50-60 Shore A durometer hardness to ASTM D 2240, 75 mm long x one half height of glazing stop x thickness to suit application. Self-adhesive on one face.

.4 Glazing tape:
.1 Preformed butyl compound with integral resilient tube spacing device, 10-15 Shore A durometer hardness to ASTM D 2240; coiled on release paper; black colour.
.2 Closed cell polyvinyl chloride foam, coiled on release paper over adhesive on two sides, maximum water absorption by volume 2%, designed for compression of 25%, to effect an air and vapour seal.

.5 Glazing splines: resilient polyvinyl chloride, extruded shape to suit glazing channel retaining slot, colour as selected.

.6 Lock-strip gaskets: to ASTM C542.

.7 Sealant: as specified in Section 07 92 00 – Joint Sealants. Low VOC.

.8 Mirror adhesive: Synthetic rubber based adhesive, waterproof and mildew resistant: Lepage PL 610 Construction Mirror Adhesive. Low VOC compliant to SCAQMD Rule 1168-03.
.9 Mirror Clips: CRL zinc plated steel Vancouver type ‘H’ clips. Size to suit.

Part 3 Execution

3.1 Manufacturer’s Instructions

.1 Compliance: Comply with manufacturer's written data, including product technical bulletins, product catalogue installation instructions, product carton installation instructions, and data sheets.

3.2 Examination

.1 Verify that openings for glazing are correctly sized and within tolerance.

.2 Verify that surfaces of glazing channels or recesses are clean, free of obstructions, and ready to receive glazing.

3.3 Preparation

.1 Clean contact surfaces with solvent and wipe dry.

.2 Seal porous glazing channels or recesses with substrate compatible primer or sealer.

.3 Prime surfaces scheduled to receive sealant.

3.4 Installation: Interior - Dry Method

.1 Fill gap between glazing and stop with sealant to depth equal to bite of frame on glazing, maximum 9 mm below sight line.

.2 Apply cap bead of sealant along void between stop and glazing, to uniform line, flush with sight line. Tool or wipe sealant surface smooth.

.3 Cut glazing tape to length and set against permanent stops, projecting 1.6 mm above sight line.

.4 Place setting blocks at 1/4 points, with edge block maximum 150 mm from corners.

.5 Rest glazing on setting blocks and push against tape for full contact at perimeter of light or unit.

.6 Place glazing tape on free perimeter of glazing.

.7 Install removable stop without displacement of tape. Exert pressure on tape for full continuous contact.

.8 Knife trim protruding tape.

.9 Glaze hollow metal doors and pressed steel screens. Glass type as indicated. Install glass in fire rated doors to meet requirements of NFPA 80 and in accordance with Section 08 88 13.

3.5 Installation: Interior Butt Glazed Method (Sealant Only)

.1 Temporarily brace glass in position for duration of glazing process. Mask edges of glass at adjoining glass edges and between glass edges and framing members.

.2 Temporarily secure a small diameter non-adhering foamed rod on backside of joint.

.3 Apply sealant to open side of joint in continuous operation; thoroughly fill the joint without displacing the foam rod. Tool the sealant surface smooth to concave profile.

.4 Permit sealant to cure then remove foam backer rod. Apply sealant to opposite side, tool smooth to concave profile.

.5 Remove masking tape.

3.6 Mirrors

.1 Coordinate work with Section 06 20 00.

.2 Install frameless mirrors in adhesive and with steel H clips, concealed fasteners.

.3 Install mirrors in one piece unless shown otherwise.

.4 Framed mirrors are specified in Section 10 28 10.

3.7 Window Film

.1 Install window film where indicated in accordance with manufacturer's instructions and reviewed shop drawings. Refer to Section 08 87 20.

3.8 Cleaning

.1 Proceed in accordance with Section 01 74 11 – Cleaning.

.2 Perform cleaning to remove construction and accumulated environmental dirt.

.3 Remove traces of primer, caulking.

.4 Remove glazing materials from finish surfaces.

.5 Remove labels after work is complete.

.6 Clean glass using approved non-abrasive cleaner in accordance with manufacturer's instructions.

.7 Upon completion of installation, remove surplus materials, rubbish, tools and equipment barriers.

3.9 Protection of Finished Work

.1 After installation, mark light with an "X" by using removable plastic tape.

End of Section

PART 1 GENERAL

1.1 General

.1 Conform to the requirements of Division 1.

1.2 Related Sections

.1	Section 05 40 00	Cold Formed Metal Framing
.2	Section 06 10 00	Rough Carpentry
.3	Section 07 92 00	Joint Sealants
.4	Section 09 22 16	Non-Structural Metal Framing
.5	Section 09 91 23	Interior Painting

1.3 References

.1 ASTM International (ASTM)
- .1 ASTM C475/C475M-17 Standard Specification for Joint Compound and Joint Tape for Finishing Gypsum Board.
- .2 ASTM C840-17a Standard Specification for Application and Finishing of Gypsum Board
- .3 ASTM C954-15 Standard Specification for Steel Drill Screws for the Application of Gypsum Panel Products or Metal Plaster Bases to Steel Studs from 0.033 in. (0.84 mm) to 0.112 in. (2.84 mm) in Thickness
- .4 ASTM C1002-16 Standard Specification for Steel Self-Piercing Tapping Screws for Application of Gypsum Panel Products or Metal Plaster Bases to Wood Studs or Steel Studs
- .5 ASTM C1047-14a Standard Specification for Accessories for Gypsum Wallboard and Gypsum Veneer Base
- .6 ASTM C1177/C1177M-17 Standard Specification for Glass Mat Gypsum Substrate for Use as Sheathing
- .7 ASTM C1178/C1178M-13 Standard Specification for Coated Glass Mat Water-Resistant Gypsum Backing Panel
- .8 ASTM C1280 - 13a Standard Specification for Application of Exterior Gypsum Panel Products for Use as Sheathing.
- .9 ASTM C1396/C1396M - 17 Standard Specification for Gypsum Board
- .10 ASTM E90-09 Standard Test Method for Laboratory Measurement of Airborne Sound Transmission Loss of Building Partitions and Elements
- .11 ASTM E814-13a Standard Test Method for Fire Tests of Penetration Firestop

.2 CSA Group (CSA)
- .1 CSA A82.31-M Gypsum Board Application.
- .2 CSA A82.27-M. Gypsum Board

.3 Canadian General Standards Board (CGSB)
- .1 CAN/CGSB-51.34, Vapour Barrier, Polyethylene Sheet for Use in Building Construction.

.4 Underwriters Laboratories of Canada (ULC)
- .1 ULC List of Equipment and Material, Volume III, Fire Resistance Ratings.

.5 CAN/ULC-S102, Building Materials and Assemblies, Standard Method of Test for Surface Burning Characteristics of.

1.4 Submittals

.1 Make submittals in accordance with Section 01 33 00 – Submittal Procedures.

.2 Submit WHMIS Material Data Safety Sheets (MSDS) for all products, prior to delivery of products to the site.

1.5 Quality Assurance

.1 Test Reports: certified test reports showing compliance with specified performance characteristics and physical properties.

.2 Certificates: product certificates signed by manufacturer certifying materials comply with specified performance characteristics and criteria and physical requirements.

.3 Pre-Installation Meetings: conduct pre-installation meeting to verify project requirements, manufacturer's installation instructions and manufacturer's warranty requirements.

1.6 Shipping, Handling and Storage

.1 Refer to Section 01 61 00 – Common Product Requirements.

.2 Deliver, handle and store materials in accordance with manufacturer’s printed instructions.

.3 Use all means necessary to protect gypsum board materials before, during and after installation and to protect the installed work and materials of other trades affected by this work. Store materials in a dry area inside the building. Do not remove wrapping until ready for use. Prevent damage to all edges and surfaces.

1.7 Environmental Requirements

.1 Maintain temperature minimum 10°C, maximum 21°C for 48 hours prior to and during application of gypsum boards and joint treatment, and for at least 48 hours after completion of joint treatment.

.2 Apply board and joint treatment to dry, frost free surfaces.

1.8 Waste Management and Disposal

.1 Refer to Section 01 74 19 – Construction Waste Management and Disposal.

PART 2 PRODUCTS

2.1 Gypsum Board

.1 To CSA A82.27-M. Standard for non-rated applications, Type X for rated applications, 1220 mm wide x maximum practical length, ends square cut, edges tapered with round edge, 12.7 mm thick or to thickness indicated on drawings. All fire rated board shall be minimum 16 mm thickness.

.2 Water and Moisture Resistant Board: to CSA A82.27 and ASTM C 630, 12.7 mm thick, 1220 mm wide with tapered edges.

2.2 Fastening and Adhesives

.1 Drywall Screws: To CSA A82.31-M, and ASTM C 1002, self-drilling, self-tapping, case hardened, length to suit board thickness and provide minimum 12 mm penetration into support.

.2 Joint Tape: 50 mm perforated with preformed seam, mould and mildew resistant.

.3 Joint Compound: To CSA A82.31-M, asbestos-free.

2.3 Acoustic Insulation

.1 Acoustic Insulation: Mineral Fibre Acoustic Insulation:
  .1 Mineral Fibre Acoustic Insulation: To ASTM C665, Mineral fibre blanket insulation, minimum density of 40 kg/m2:
    .1 AFB Acoustical Fire Batts manufactured by Roxul Inc.
    .2 STC contribution and fire resistance (hr): Refer to NBC 1995, tables A-9.10.3.1-A/-B and Product Data Sheet for various assemblies contributing to acoustic performance and fire resistance.
.2 Surface burning characteristics to CAN/ULC-S102:
  .1 flame spread: 15
  .2 smoke developed: 5
  .3 Smoulder resistance: to ULC S-129.
  .4 Non-combustible: to CAN4-S114.
    .1 Thickness to suit depth of wall framing and as indicated.

.3 Acoustic sealant: To ASTM E814 and ASTM E1966, with STC performance rating of 55 to ASTM E90.

2.4 Accessories

.1 Casing Beads, Corner Beads and Edge Trim: To ASTM C 1047, 0.5 mm gauge base thickness commercial grade sheet steel with G90 zinc finish to ASTM A525-80A; perforated flanges; one piece length per location.

.2 Insulating Strip: Rubberized, moisture resistant, 3.0 mm thick, 12 mm wide closed cell neoprene strip, with self-sticking permanent adhesive on one face; lengths as required.

PART 3 EXECUTION

3.1 Acoustic insulation

.1 Install acoustic blankets full width and length, with tight joints, between wall framing and around penetrating electrical service boxes, piping, air ducts and frames.

.2 Place acoustic blankets where indicated on the Drawings and to thickness required to obtain acoustic performance indicated for the assembly.

.3 Place acoustic blankets between studs ensuring friction fit, free of sags, folds or open joints that may let sound pass through.

.4 Install blankets from the bottom up, tightly adjusted and trim accurately with a utility knife.

3.2 Gypsum Board Application

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

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

.3 Do not apply gypsum board to ceilings until insulation, vapour retarder and air seals have been installed and inspected by others, including consultant, owner and municipal building inspectors.

.4 Apply gypsum board at right angles to framing members or furring using screw fasteners. Maximum spacing of screws 300 mm o.c.

.5 Apply water resistant gypsum wallboard where indicated. Apply water resistant sealant to edges, ends and cut outs which expose gypsum core.

3.3 Accessories

.1 Erect accessories straight, plumb or level, rigid and at proper plane. Use full length pieces where practical. Make joints tight, accurately aligned and rigidly secured. Mitre and fit corners accurately, free from rough edges.

.2 Install casing beads where gypsum board butts against surfaces having no trim concealing junction and where indicated.

.3 Install continuous bead of acoustic sealant at all penetrations through sound control partitions.

3.4 Access Doors

.1 Install access doors to electrical and mechanical fixtures specified in respective Sections.

.2 Rigidly secure frames to furring or framing systems, to satisfy fire rating requirements.

3.5 Taping and Filling

.1 Finish face panel joints and internal angles with joint system consisting of joint compound, joint tape and taping compound installed according to manufacturer's directions and feathered out onto panel faces.

.2 Finish corner beads, control joints and trims as required with two coats of joint compound and one coat of taping compound, feathered out onto panel faces.

.3 Fill screw head depressions with joint and taping compounds to bring flush with adjacent surface of gypsum board so as to be invisible after painting is completed.

.4 Sand lightly to remove burred edges and other imperfections. Avoid sanding adjacent surface of board.

.5 Completed installation to be smooth, level or plumb, free from waves and other defects and ready for painting.

3.6 Cleaning

.1 Proceed in accordance with Section 01 74 11 – Cleaning.

End of Section

Part 1 General

1.1 General

.1 Conform to the requirements of Division 1.

1.2 Related Sections

.1 Section 05 40 00 Cold Formed Metal Framing
.2 Section 09 21 16 Gypsum Board

1.3 References

.1 ASTM International (ASTM).
.1 ASTM A653/A653M-17 Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process
.2 ASTM C645-18 Specification for Nonstructural Steel Framing Members.
.3 ASTM C754-18, Specification for Installation of Steel Framing Members to Receive Screw-Attached Gypsum Panel Products.
.4 ASTM E90-09(2016) Standard Test Method for Laboratory Measurement of Airborne Sound Transmission Loss of Building Partitions and Elements.
.5 ASTM E1966-15 Standard Test Method for Fire-Resistive Joint Systems
.2 Canadian General Standards Board (CGSB).
.1 CAN/CGSB-1.40-97, Primer, Structural Steel, Oil Alkyd Type.
.3 Underwriters Laboratories of Canada (ULC)
.1 ULC List of Equipment and Material, Volume III, Fire Resistance Ratings.
.4 CSSBI Lightweight Steel Framing Manual

1.4 Submittals

.1 Make submittals in accordance with Section 01 33 00 – Submittal Procedures.

.2 Submit shop drawings for lightweight steel interior roof framing systems. Indicate layout and details of fabrication and erection. Indicate member sizes and gauges of materials, framing, method of fastenings, spacing of all members, bridging and bracing. Indicate design loads.

.3 Lightweight steel framing systems shall be designed by, and each shop drawing shall bear the stamp of a registered Professional Engineer licensed to practice in the Province of Ontario. Each submission of the shop drawings shall bear the seal of the Engineer.

1.5 Quality Assurance

.1 Test Reports: certified test reports showing compliance with specified performance characteristics and physical properties.

.2 Certificates: product certificates signed by manufacturer certifying materials comply with specified performance characteristics and criteria and physical requirements.

.3 Pre-Installation Meetings: conduct pre-installation meeting to verify project requirements, manufacturer's installation instructions and manufacturer's warranty requirements.

1.6 Shipping, Handling and Storage

.1 Refer to Section 01 61 00 – Common Product Requirements.

.2 Deliver, handle and store materials in accordance with manufacturer’s printed instructions.

1.7 Waste Management and Disposal

.1 Refer to Section 01 74 19 – Construction Waste Management and Disposal.

.2 Remove from site and dispose of packaging materials at appropriate recycling facilities.

.3 Collect and separate for disposal packaging material for recycling in accordance with Waste Management Plan.

.4 Divert unused metal materials from landfill to metal recycling facility.

Part 2 Products

2.1 Metal Furring and Suspension Systems

.1 Metal Furring Runners, Hangers, Tie Wires, Inserts, Anchors: To CSA A82.30-M, electro-zinc coated steel.

.2 Runner Channels: 38 x 19 x 0.59 mm and 38 x 9.5 x 0.45 mm, hot dip or electro-galvanized sheet steel. Use of various sizes governed by applied loads and applicable spans.

.3 Drywall Furring Channel: Channel shaped furring member for screw attachment of

drywall with knurled face. For interior use. Furring masonry or concrete surfaces. Cross furring under steel joist or suspended metal channels in suspended ceiling systems: 70 x 22 x 0.9 mm with knurled face, hot dip or electro-galvanized sheet steel. Bailey D-1001.

.4 Hangers: minimum 4.1 mm diameter (or as required to by ULC fire rating design requirements) mild steel rods.

2.2 Metal Stud Framing Systems

.1 Non-load bearing channel stud framing: to ASTM C645, stud size as indicated, roll formed from 0.53 mm thickness hot dipped galvanized steel sheet, for screw attachment of gypsum board. Knock-out service holes at 460 mm centres.
.1 Gauge of materials to conform to referenced standards unless noted otherwise.

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

.3 Metal channel stiffener: 1.4 mm thick cold rolled steel, coated with rust inhibitive coating.

.4 Tie Wire: 0.90 mm, galvanized, soft annealed, steel wire or clip as recommended by the manufacturer of furring channels.

2.3 Fasteners

.1 Powder activated fasteners: to suit structural conditions and fastening requirements and in accordance with manufacturer’s recommendations: Ramset; Hilti; or approved equivalent.

.2 Sheet Metal Screws: To CSA A82.31-M, and ASTM C1002, self-drilling, self-tapping, case hardened, length to suit board thickness and provide minimum 12 mm penetration into support.

2.4 Accessories

.1 Acoustic sealant: To ASTM E814 and ASTM E1966, with STC performance rating of 55 to ASTM E90.

.2 Insulating strip: rubberized, moisture resistant 3 mm thick foam strip, 12 mm wide, with self-sticking adhesive on one face, lengths as required.

.3 Zinc Rich Paint: to CGSB 1-GP-181M. Low VOC type meeting requirements of SCAQMD Rule 1113-96.

Part 3 Execution

3.1 Erection

.1 Align partition tracks at floor and ceiling and secure at 600 mm on centre maximum.

.2 Install damp proof course under stud shoe tracks of partitions on slabs on grade.

.3 Place studs vertically at 400 mm on centre unless noted otherwise and not more than 50 mm from abutting walls, and at each side of openings and corners. Position studs in tracks at floor and ceiling. Cross brace steel studs as required to provide rigid installation to manufacturer's instructions.

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

.5 Attach studs to bottom and ceiling track using screws.

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

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

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

.9 Install heavy gauge single jamb studs at openings.

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

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

.12 Provide 40 mm stud or furring channel secured between studs for attachment of fixtures behind lavatory basins, toilet and bathroom accessories, and other fixtures including grab bars and towel rails, attached to steel stud partitions.

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

.14 Extend partitions to minimum 200 mm above ceiling height except where noted otherwise on drawings.

.15 Maintain clearance under beams and structural slabs to avoid transmission of structural loads to studs. Use 50 mm leg ceiling tracks.

.16 Install continuous insulating strips to isolate studs from un-insulated surfaces.

.17 Install two continuous beads of acoustical sealant under studs and tracks around perimeter of sound control partitions.

3.2 Wall Furring

.1 Install wall furring for gypsum board wall finishes in accordance with CSA A82.31-M, except where specified otherwise and shown on drawings.

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

.3 Furr duct shafts, beams, columns, pipes and exposed services where indicated.

3.3 Suspended and Furred Ceilings and Bulkheads

.1 Erect hanger and runner channels for suspended gypsum board ceilings in accordance with CSA A82.31-M except where specified otherwise and indicated on drawings.

.2 Securely anchor hanger to structural supports 1220 mm o.c. maximum along runner channels and not more than 150 mm from ends. Under no circumstances shall hanger wires be secured to or supported from mechanical or electrical materials or equipment or penetrate mechanical ductwork.

.3 Space runner or furring channels as shown on drawings and not more than 610 mm o.c. maximum nor 150 mm from walls. Run channels in long direction of board. Bend hanger sharply under bottom flange of runner and securely wire in place with a saddle tie. Provide channels below mechanical or electrical equipment and mechanical ductwork to maintain maximum spacing.

.4 Install furring channels transversely across runner channels in short direction of wallboard at 610 mm o.c. maximum or 150 mm from walls and interruptions in ceiling continuity. Secure channels to support with furring clips or wire. Where splicing is necessary lap minimum 200 mm and wire tie each end with double loops of 0.90 mm gauge galvanized tie wire, 25 mm from each end of overlap.

.5 Support light fixtures by providing additional ceiling suspension hangers within 150 mm of each corner and at maximum 610 mm around perimeter of fixture. Coordinate with Electrical.

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

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

.8 Install furring channels parallel to, and at exact locations of steel stud partition header track.

.9 Furr for gypsum board faced vertical bulkheads within or at termination of ceilings.

3.4 Gypsum Board

.1 Installation of gypsum board is specified in Section 09 21 16

3.5 Cleaning

.1 Proceed in accordance with Section 01 74 11 – Cleaning.

.2 Upon completion of installation, remove surplus materials, rubbish, tools and equipment barriers.

End of Section

PART 1 GENERAL

1.1 General

.1 Conform to the requirements of Division 1.

1.2 Related Sections

.1 Section 03 30 00 Cast-in-Place Concrete
.2 Section 04 20 00 Concrete Unit Masonry
.3 Section 07 92 00 Joint Sealants
.4 Section 09 21 16 Gypsum Board

1.3 References

.1 ASTM International (ASTM)
  .1 ASTM C207-06(2011) Standard Specification for Hydrated Lime for Masonry Purposes
  .2 ASTM C150/C150M-18 Standard Specification for Portland Cement
.2 American National Standards Institute (ANSI)
  .1 ANSI A118.1 Specifications for Dry-Set Portland Cement Mortar (Included in ANSI A108.1)
.3 Canadian General Standards Board (CGSB)
  .1 CAN/CGSB-51.33-M Vapour Barrier Sheet, Excluding Polyethylene, for Use in Building Construction
  .2 CGSB 71 GP 22M Adhesive, Organic, for Installation of Ceramic Wall Tile
  .3 CAN/CGSB-75.1M, Tile, Ceramic
.4 CSA Group (CSA)
  .1 CAN/CSA A5-93, Portland Cement
  .2 CSA A82.5-M Structural Clay Non-Load-Bearing Tile
  .3 CSA A123.3 M, Asphalt or Tar Saturated Roofing Felt
  .4 CSA A 3000-13 - Cementitious Materials Compendium
.5 Terrazzo, Tile and Marble Association of Canada (TTMAC)
.6 Ontario Regulation 585/90 – Public Pools

1.4 Submittals

.1 Make submittals in accordance with Section 01 33 00 – Submittal Procedures.

.2 Submit duplicate samples of tile to the Consultant for approval. Samples to be submitted on 300 x 600 mm sample board for each colour, texture, size and pattern of tile. Grout sample joints for representative sample of final installation.

.3 Submit colour charts for selection of grout.

.4 Shop drawings: submit tiling plans giving all details of special fittings, expansion joints, joint layout, etc.

.5 Maintenance Data: Provide maintenance data for tile work, for incorporation into Maintenance Manuals specified under Section 01 78 00.

1.5 Quality Assurance

.1 Do tile work in accordance with Installation Manual 200, Ceramic Tile, by Terrazzo, Tile and Marble Association of Canada (TTMAC), except where this specification is more stringent.

.2 For the actual installation of ceramic wall and floor tile, use only skilled tradesmen who are familiar with the referenced standards and with the requirements for this Work.

.3 Installer of ceramic tiles shall have a minimum of 10 years of experience including at least five projects of similar scope and scale. Submit documented proof of experience prior to commencing work of this Section.

.4 The setting material manufacturer's representative shall review the details with the Contractor prior to the start of work. Instruct the Contractor on the proper installation procedures to ensure compliance with the guarantee requirements.

.5 Pre Installation Conference
- .1 Convene one week prior to commencing work of this section.
- .2 Require attendance of installation material manufacturer, tile supplier, tile installer and installers of related work. Review installation procedures and coordination required with related work.
- .3 Meeting agenda includes but is not limited to:
  - .1 Tile and installation material compatibility.
  - .2 Grouting procedure.
  - .3 Maintenance and cleaning products and methods.
  - .4 Surface Preparation.

1.6 Shipping, Handling and Storage

.1 Refer to Section 01 61 00 – Common Product Requirements.

.2 Deliver packaged materials in original unopened containers.

.3 Keep delivered material dry and free from stains. Store cementitious material off damp surfaces.

.4 Use all means necessary to protect floor and wall tile materials, before, during and after installation and to protect the installed work and materials of all other trades.

.5 In the event of damage, immediately make all repairs and replacements necessary to the approval of the Consultant and at no additional cost to the Owner.

.6 Deliver, handle and store materials in accordance with manufacturer’s printed instructions.

1.7 Environmental Conditions

.1 Maintain air temperature and structural base temperature at ceramic tile installation area above 12° C for 48 hours before, during and after installation.

1.8 Waste Management and Disposal

.1 Refer to Section 01 74 19 – Construction Waste Management and Disposal.

1.9 Warranty

.1 Provide setting materials manufacturer's 5 year materials and labour guarantee against break down or deterioration of the waterproof membrane and setting materials.

PART 2 PRODUCTS

2.1 Materials

.1 Materials shall be graded and containers grade sealed, delivered to the job site in their original packages or containers with the manufacturer's labels and seals intact.

.2 Tile and grout colour shall be selected by the Consultant from the manufacturer's standard range of colours.

.3 Tile shall conform to CAN/CGSB-75.1.

.4 Provide coves, cove bases, corners, reveals, surf caps, inners and outers as required to complete the work.

2.2 Ceramic Tile

.1 PCT1 Ramp floor tiles unless noted otherwise; Daltile Keystones, 50mm x 50 mm, Suede Gray Criss Cross Mosaic 50mm x 50mm straight joint tile.

.2 PCT2 Olympia Regal Series 30 x 60 cm. Matte Finish. Grey Matte (Running bond pattern)

.3 CT1 Corridor wall tiles unless noted otherwise: Olympia Color and Dimension, Silver Grey Bright Finish, 100mm x 300mm, stack bond.

2.3 Mortar, Grout, Additives and Adhesives

.1 The following is based on a system of products manufactured by Laticrete International Inc. Mapei Products as listed are pre-approved as equivalent. The products of one manufacturer shall be used throughout the project to ensure compatibility of materials:
  .1 Water: Fresh, clean, potable, free from deleterious matter, acids or alkalis.
  .2 Floors: (thinset) T.T.M.A. Detail #317 SP-2000 “A”.
    .1 Thinset mortar: Laticrete 4237 latex additive plus 211 Crete filler powder or Mapei Kerabond mixed with Keralastic high performance latex admixture.
    .2 Levelling Compound (if required): Laticrete 3701 latex or 226 Mapecem mortar mixed with Planicrete 50.
    .3 Grout: Laticrete Latapoxy SP100, solid epoxy grout or Mapei Kerapoxy. Colours to Consultant's selection.
  .3 Walls:
    .1 Concrete and Concrete Block: T.T.M.A.C. Detail #303W-2000:
      .1 Levelling Coat: Laticrete 3701 or Mapei Mapecem mixed with Planicrete 50.
      .2 Waterproof membrane (shower walls only): Laticrete 9235 liquid applied reinforced membrane or Mapei PRP315 with fiberglass mesh and Mapei board corner pieces for all 90 degree corners.
    .2 Thinset mortar: Laticrete 4237 latex additive plus 211 Crete filler powder or Mapei Kerabond mixed with Keralastic high performance latex admixture.
    .3 Grout: Laticrete Latapoxy SP100 solid epoxy grout or Kerapoxy. Colours to Consultant's selection.

2.4 Floor Sealer and Protective Coating

.1 To tile and grout manufacturer’s recommendations.

2.5 Accessories

.1 Reducers, edge trim, movement joints: Schluter Systems purpose made stainless steel.

.2 Transition strip T1 Schluter Schiene Basic Finish, Zinc

.3 Sealant: as specified in Section 07 90 00.

PART 3 EXECUTION

3.1 Surface Conditions

.1 Surfaces on which wall and floor tile is to be applied, shall be thoroughly cleaned down.

.2 Concrete must be cured a minimum of 35 days before installation of ceramic tile.

.3 Drywall surfaces on which wall and floor tile is to be applied, shall be free from dust, excess plaster and shall be plain and true without any irregularities.

.4 Completely remove existing ceramic tile where indicated to provide a suitable and sound substrate. Remove tile, grout and adhesives in accordance with TTMAC recommendations.

.1 All old cementitious residues must be removed by a terrazzo grinder or surfaces must be abraded by either sand blasting or carborundum disc, to secure a good mechanical bond.

.2 Examine existing substrate and report any unsound or unsuitable materials or conditions to the Consultant.

.5 Concrete floor slabs, concrete and masonry walls on which floor and wall tile are to be applied, shall be thoroughly cleaned down and all dust, efflorescence, dirt, etc. removed. Concrete and masonry wall surfaces to which wall tile is to be applied shall be levelled off as required with mortar adhesive to produce true flat surfaces.

.6 Existing painted concrete or masonry wall surfaces to receive ceramic tile shall be thoroughly cleaned of all paint down to concrete or concrete block surfaces using paint stripper. Prepare painted surfaces in accordance with manufacturer's instructions and TTMAC recommendations.

.7 In the event of discrepancies, immediately notify the Consultant and do not proceed with installation in such areas until all such discrepancies have been fully resolved.

.8 Install transition strips, reducers and edge trim at exposed edges of all tiled walls and floors in accordance with manufacturer's instructions.

.9 Ensure that conditions are suitable to receive membrane and tile. Report any adverse conditions to the Consultant. Commencement of the work will indicate acceptance of the surfaces to receive the tile.

.10 Remove from the job site all damaged or broken items caused by improper handling or storage.

.11 Ensure that all materials are fresh before starting work by recommended tests on site to ensure proper, permanent bonds.

.12 Check that conditions of temperature, humidity, traffic and usage are suitable as required by Installation Manual specifications. Minimum temperature to be not less than 10°C.

.13 Check that surfaces ready to receive tiling are cured, level and/or graded, plumb, smooth, firm, free from loose particles, droppings, projection, grease, solvent, paint and other foreign matter

and from other unsuitable conditions.

3.2 Installation

.1 Expansion joints which are required for structural reasons must be continued to the same width in the bedding mortar and tile cladding. Clean out joint when dry and apply a pore sealed backfill material and fill with sealant. Refer to Section 07 92 00.

.2 Waterproof membrane and setting materials shall be installed in strict accordance with manufacturer's instructions.

.3 Fit tile around corners, fitments, fixtures, and other built-in objects to maintain uniform joint appearance. Utilize appropriate accessory tiles at corners and junctions. Cut edges smooth, even and free from chipping. Edges resulting from splitting not acceptable.

.4 Joints between tiles shall be uniform in width, plumb, straight, evenly spaced with adjacent tile flush and planeness in accordance with surface tolerance specified.

.5 Install tile on substrates as noted on drawings and specified herein utilizing specified setting materials in strict accordance with manufacturers written instructions. Follow T.T.M.A.C. guidelines for expansion and control joints.

.6 Locate and install control joints utilizing colour matched sealant at all corners and where recommended by substrate and tile manufacturers and where indicated on drawings and approved by the Consultant.

.7 Unless specifically noted otherwise, all tile wall base is to be constructed using special trim shapes such as mosaic coves and mosaic bull nose tiles as part of a tile mosaic cove base (with TMCB designation) and cove where continuous with wall tile (with–C designation). Use special inside and outside trim shapes for all edges and corners.

.8 Unless specifically noted otherwise, in areas where ceramic tile is indicated, provide ceramic tile base with cove trim. Base to be 100 mm high with additional cut tiles to allow for slope in floor.

.9 All materials to be installed as per manufacturer’s instructions.

3.3 Grouting

.1 Grout all tile using specified grout in strict accordance with manufacturers written instructions all to give a flush, hard joint.

.2 Joints in tile floor and base shall be filled solid and flush with grout.

.3 Joints in wall tile shall be filled solid and flush with grout.

.4 Prepare joints and mix grout in accordance with manufacturer's printed instructions. Force maximum amount of grout into joints, avoiding air traps or voids.

.5 Remove all excess grout by washing diagonally across the joints. Check for voids, air pockets and gaps and fill same. Remove all discoloured grout and replace with new.

.6 Cure all joints.

3.4 Extra Stock

.1 Upon completion of the installation and as a condition of acceptance, deliver to the Owner 1% of tile and accessory tiles in each colour and pattern of ceramic tiles installed under this section for the Owners maintenance program. Identify each carton for location and installation date. Submission must be made all at one time and prior to Substantial Performance.

3.5 Cleaning

.1 Proceed in accordance with Section 01 74 11 – Cleaning.

.2 On completion, check work and replace defective, upset or misaligned tile. Make good skips, voids or excess grouting to the Consultant's approval.

.3 Immediately following removal of grout from surface of ceramic tile, remove dust and wipe clean.

.4 Thoroughly clean and polish all exposed surfaces of ceramic wall tile.

.5 Leave tiles clean, free of any apparent cement or epoxy film. Any epoxy film shall be removed with epoxy film remover within 24 hours maximum from commencement of grouting. Ensure compatibility of epoxy film remover with grout materials.

.6 Protect tiling during the works and until completion of the work with recommended methods and materials.

End of Section

PART 1 GENERAL

1.1 General

.1 Conform to the requirements of Division 1.

1.2 Related Sections

.1 Section 09 21 16 Gypsum Board
.2 Section 09 53 00 Acoustical Suspension

1.3 References

.1 ASTM International (ASTM)
  .1 ASTM C423-17 Standard Test Method for Sound Absorption and Sound Absorption Coefficients by the Reverberation Room Method
  .2 ASTM E84-21a Standard Test Method for Surface Burning Characteristics of Building Materials
  .3 ASTM E1264-19 Standard Classification for Acoustical Ceiling Products
  .4 ASTM E1414/E1414M-21a Standard Test Method for Airborne Sound Attenuation Between Rooms Sharing a Common Ceiling Plenum
  .5 ASTM E1477-98A(2017) Standard Test Method for Luminous Reflectance Factor of Acoustical Materials by Use of Integrating-Sphere Reflectometers
.2 Underwriters Laboratories of Canada (ULC)
  .1 ULC 102-2018 Standard Method of Test for Surface Burning Characteristics of Building Materials and Assemblies.

1.4 Submittals

.1 Make submittals in accordance with Section 01 33 00 – Submittal Procedures.

.2 Product Data: Submit manufacturer's technical data for each type of acoustical ceiling unit and suspension system required.
  .1 Acoustical Certifications: Manufacturer's certifications that products comply with specified requirements, including laboratory reports showing compliance with specified tests and standards. For acoustical performance, each carton of material must carry an approved independent laboratory classification of NRC, CAC, and AC.

.3 Submit duplicate 300 x 300 mm samples of each type of acoustical units.

.4 Provide maintenance data for acoustic panel ceilings for incorporation into Operation and Maintenance Manual specified in Section 01 78 00 – Closeout Submittals.

1.5 Quality Assurance

.1 Single-Source Responsibility: Provide acoustical panel units and grid components by a single manufacturer.
  .1 Fire Performance Characteristics: Identify acoustical ceiling components with appropriate markings of applicable testing and inspecting organization.
  .2 Surface Burning Characteristics: As follows, tested per ASTM E84 and complying with ASTM E1264 Classification.
  .3 Fire Resistance: As follows tested per ASTM E119 and listed in the appropriate floor or roof design in the Underwriters Laboratories Fire Resistance Directory

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

.3 Mock-up:
- .1 Construct mock-ups in accordance with Section 01 45 00 - Quality Control.
- .2 Construct mock-up 10 m² minimum of acoustical panel tile ceiling including one inside corner and one outside corner.
- .3 Construct mock-up where directed.
- .4 Allow 48 hours for inspection of mock-up by Consultant before proceeding with ceiling work.
- .5 When accepted, mock-up will demonstrate minimum standard for this work. Mock-up may remain as part of the finished work.

1.6 Project Conditions

.1 Permit wet work to dry before beginning to install.

.2 Maintain uniform minimum temperature of 15° C and humidity of 20-40% before and during installation.

.3 Store materials in work area 48 hours prior to installation.

.4 Building areas to receive ceilings shall be free of construction dust and debris.

1.7 Performance Requirements

.1 Surface-Burning Characteristics: Conform to ULC S102 or ASTM E84; testing by a qualified testing agency. Identify products with appropriate markings of applicable testing agency.

.2 Seismic Performance: Acoustical ceiling shall withstand the effects of earthquake motions determined according to applicable code.

1.8 Shipping, Handling and Storage

.1 Refer to Section 01 61 00 – Common Product Requirements.

.2 Deliver, handle and store materials in accordance with manufacturer’s printed instructions.

.3 Protect on site stored or installed absorptive material from moisture damage.

1.9 Waste Management and Disposal

.1 Refer to Section 01 74 19 – Construction Waste Management and Disposal.

1.10 Extra Materials

.1 Provide extra materials of acoustic units in accordance with Section 01 78 00 - Closeout Submittals.

.2 Provide acoustical units amounting to 5% of gross ceiling area for each pattern and type required for project.

.3 Ensure extra materials are from same production run as installed materials.

PART 2 PRODUCTS

2.1 Materials

.1 Acoustic units for suspended ceiling system: to ASTM E1264

.2 Panel Type C1 Typical at all acoustic ceiling locations outlined on plan and includes new ceiling grid and panels:
- .1 Surface Texture: Non directional fibres
- .2 Composition: Mineral Fiber & Sag Resistant
- .3 Color: White
- .4 Size:
  - .1 C1: 610 x 1220 mm (16mm minimum thickness)
- .5 Edge Profile: Square lay-in
- .6 Noise Reduction Coefficient (NRC) ASTM C423 Classified w/ UL label on product carton 0.55
- .7 Ceiling Attenuation Class (CAC): ASTM C1414; Classified with UL label on product carton 38
- .8 Articulation Class (AC): ASTM E1111; Classified with UL label on product carton 170
- .9 Flame Spread: ASTM E1264; Class A (HPVA)
- .10 Light Reflectance (LR) White Panel: ASTM E1477; 0.85
- .11 Recycle Content: Up to 76% total recycled content. (Total recycled content: pre-consumer, post-consumer and post-industrial)
- .12 Material Ingredient Transparency: Health Product Declaration (HPD); Declare Label
- .13 Life Cycle Assessment: Third Party Certified Environment Product Declaration (EPD)
- .14 Acceptable Product: Armstrong World Industries Canada Fine Fissured 1729

.3 Alternate manufacturer: Products as manufactured by the following are acceptable, subject to Consultants approval of style, finish, performance characteristics and texture:
- .1 Armstrong Ceilings: Fissured

.4 Ceiling Suspension System: as specified in Section 09 53 00.

PART 3 EXECUTION

3.1 Examination

.1 Do not install acoustical panels until work above ceiling has been inspected by Consultant.

3.2 Installation

.1 Co-ordinate with Section 09 53 00 - Acoustical Suspension.

.2 Coordinate layout and installation of ceilings with other construction that penetrates ceilings or is supported by them, including light fixtures, HVAC equipment, and fire-suppression system.

.3 Install acoustical panels and tiles in ceiling suspension system.

.4 Install acoustical units parallel to building lines with edge unit not less than 50% of unit width, with directional pattern running in same direction. Refer to reflected ceiling plan.

.5 Scribe acoustic units to fit adjacent work. Butt joints tight, terminate edges with moulding

3.3 Cleaning

.1 Proceed in accordance with Section 01 74 11 – Cleaning.

End of Section

Part 1 General

1.1 General

.1 Conform to the requirements of Division 1.

1.2 Related Sections

.1 Section 05 12 23 Structural Steel
.2 Section 09 21 16 Gypsum Board
.3 Section 09 51 13 Acoustic Panel Ceilings
.4 Division 23 Mechanical
.5 Division 26 Electrical

1.3 References

.1 ASTM International (ASTM)
.1 ASTM A307-21 Standard Specification for Carbon Steel Bolts, Studs, and Threaded Rod 60 000 PSI Tensile Strength
.2 ASTM A641/A641M-19 Standard Specification for Zinc–Coated (Galvanized) Carbon Steel Wire.
.3 ASTM A1011/A1011M-18a Standard Specification for Steel, Sheet and Strip, Hot-Rolled, Carbon, Structural, High-Strength Low-Alloy, High-Strength Low-Alloy with Improved Formability, and Ultra-High Strength
.4 ASTM C635/C635M-17 Standard Specification for the Manufacture, Performance, and Testing of Metal Suspension Systems for Acoustical Tile and Lay in Panel Ceilings.
.5 ASTM C636/C636M-19 Standard Practice for Installation of Metal Ceiling Suspension Systems for Acoustical Tile and Lay-In Panels.
.6 ASTM A653 / A653M – 20 Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process
.7 ASTM E84-21a Standard Test Method for Surface Burning Characteristics of Building Materials
.8 ASTM E119-20 Standard Test Methods for Fire Tests of Building Construction and Materials
.9 ASTM E1264-19 Standard Classification for Acoustical Ceiling Products

1.4 Submittals

.1 Make submittals in accordance with Section 01 33 00 – Submittal Procedures.

.2 Product Data: Submit manufacturer's technical data for each type of acoustical ceiling unit and suspension system required.

.3 Acoustical Certifications: Manufacturer's certifications that products comply with

specified requirements, including laboratory reports showing compliance with specified tests and standards.

.4 Submit one representative model of each type of ceiling suspension system.
.1 Ceiling system to show basic construction and assembly, treatment at walls, recessed fixtures, splicing, interlocking, finishes, acoustical unit installation.

1.5 Design Requirements

.1 Determine the superimposed loads that will be applied to suspension systems by components of the building other than the ceiling and ensure that adequate hangers are installed to support the additional loads in conjunction with the normal loads of the system.

.2 Design supplemental suspension members and hangers where width of ducts and other construction within ceiling plenum produces hanger spacing that interferes with location of hangers at required spacing to support standard suspension system members:
.1 Size supplemental suspension members and hangers to support ceiling loads within performance limits established by referenced standards and publications.

.3 Rigidly secure acoustic ceiling system including integral mechanical and electrical components with maximum deflection of L/360 to ASTM C635 deflection test.

1.6 Performance Requirements

.1 Seismic Performance: Acoustical ceiling shall withstand the effects of earthquake motions determined according to applicable code.

1.7 Quality Assurance

.1 Single-Source Responsibility: Provide acoustical panel units and grid components by a single manufacturer.

.2 Fire Performance Characteristics: Identify acoustical ceiling components with appropriate markings of applicable testing and inspecting organization.
.1 Surface Burning Characteristics: Tested per ASTM E84 and complying with ASTM E1264 Classification.

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

.4 Where required, provide fire-resistance rated suspension system: certified by a Canadian Certification Organization accredited by Standards Council of Canada.

.5 Construct mock-ups in accordance with Section 01 45 00 - Quality Control and as described in Section 09 51 13.

1.8 Shipping, Handling and Storage

.1 Refer to Section 01 61 00 – Common Product Requirements.

.2 Deliver, handle and store materials in accordance with manufacturer's printed instructions.

1.9 Waste Management and Disposal

.1 Refer to Section 01 74 19 – Construction Waste Management and Disposal.

Part 2 Products

2.1 Materials

.1 Ceiling suspension systems and all components shall be as recommended by manufacture for high humidity and high corrosive environments.

.2 Components: All main beams and cross tees, base metal and end detail shall be commercial quality hot-dipped galvanized steel as per ASTM C635. Main beams and cross tees shall be double-web steel construction with type exposed flange design. Exposed surfaces chemically cleansed, capping pre-finished galvanized steel in baked polyester paint. Main beams and cross tees shall have rotary stitching.

.3 Face width: 22 mm

.4 Edge Moldings and Trim: Hemmed angle moulding to match main beams and cross tees.

.5 Structural Classification: Intermediate Duty System, ASTM C635.

.6 Colour: White and match the actual colour of the specified ceiling tile.

.7 Standard of Acceptance: Armstrong Prelude Plus XL Aluminum 15/16" Exposed Tee

.8 Attachment Devices: Size for five times design load indicated in ASTM C635, Table 1, Direct Hung unless otherwise indicated or required.

.9 Threaded Rod: to ASTM A397. Galvanized or zinc plated.

.10 Wire for Hangers and Ties: ASTM A641, Class 1 zinc coating, soft annealed, with a yield stress load of at least three times design load, but not less than 12 gauge.

.11 Channel Framing and Fittings: Strut type metal framing and components to ASTM A1011 or ASTM A653. Unistrut P1000SL or equivalent. Galvanized.

Part 3 Execution

3.1 Manufacturer’s Instructions

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

3.2 Examination

.1 Do not proceed with installation until all wet work such as concrete, plastering and painting has been completed and thoroughly dried out, unless expressly permitted by manufacturer's printed recommendations.

3.3 Preparation

.1 Measure each ceiling area and establish layout of acoustical units to balance border widths at opposite edges of each ceiling. Avoid use of less than half width units at borders and comply with reflected ceiling plans. Coordinate panel layout with mechanical and electrical fixtures.

.2 Coordination: Furnish layouts for preset inserts, clips, and other ceiling anchors whose installation is specified in other sections.
.1 Furnish concrete inserts and similar devices to other trades for installation well in advance of time needed for coordination of other work.

3.4 Installation

.1 Install suspension system and panels in compliance with ASTM C636; CISCA Seismic Guidelines and in accordance with the manufacturer's installation instructions.

.2 Install wall moldings at intersection of suspended ceiling and vertical surfaces.

.3 Do not erect ceiling suspension system until work above ceiling has been inspected by Consultant.

.4 Secure hangers to overhead structure using attachment methods as indicated by manufacturer. Do not suspend ceiling systems from building services including plumbing lines, conduit, cable trays or duct work.

.5 Hanger and bracing wires shall not attach to or bend around obstructions including but not limited to: piping, ductwork, conduit and equipment. Provide trapeze or other supplementary support members at obstructions to allow typical hanger spacing. Brace assemblies must be configured and/or located in order to avoid obstructions in addition to maintaining the required brace assembly spacing.

.6 Install hangers spaced at maximum 1219 mm centres and within 152 mm from ends of main tees. Install hanger wires plumb and straight.

.7 Lay out centre line of ceiling both ways, to provide balanced borders at room perimeter with border units not less than 50% of standard unit width.

.8 Ensure suspension system is coordinated with location of related components.

.9 Completed suspension system to support super-imposed loads, such as lighting fixtures, diffusers, grilles, and speakers.

.10 Support at light fixtures and diffusers with additional ceiling suspension hangers within 150 mm of each corner and at maximum 610 mm around perimeter of fixture.

.11 Interlock cross member to main runner to provide rigid assembly.

.12 Frame at openings for light fixtures, air diffusers, speakers and at changes in ceiling heights.

.13 Install access splines to provide ceiling access.

.14 Finished ceiling system to be square with adjoining walls and level within 1:1000

3.5 Cleaning

.1 Proceed in accordance with Section 01 74 11 – Cleaning.

.2 Touch up scratches, abrasions, voids and other defects in painted surfaces

End of Section

PART 1 GENERAL

1.1 General

.1 Conform to the requirements of Division 1.

1.2 Related Sections

.1 Section 03 30 00 Cast-in-Place Concrete
.2 Section 07 92 00 Joint Sealants
.3 Section 09 21 16 Gypsum Board

1.3 References

.1 ASTM International (ASTM)
  .1 ASTM D2047-17 Standard Test Method for Static Coefficient of Friction of Polish-Coated Flooring Surfaces as Measured by the James Machine
  .2 ASTM E648-19ae1 Standard Test Method for Critical Radiant Flux of Floor-Covering Systems Using a Radiant Heat Energy Source
  .3 ASTM E662-21ae1 Standard Test Method for Specific Optical Density of Smoke Generated by Solid Materials
  .4 ASTM F710-22 Standard Practice for Preparing Concrete Floors to Receive Resilient Flooring
  .5 ASTM F970-22 Standard Test Method for Measuring Recovery Properties of Floor Coverings after Static Loading
  .6 ASTM F1303-04(2021) Standard Specification for Sheet Vinyl Floor Covering with Backing
  .7 ASTM F1869-22 Standard Test Method for Measuring Moisture Vapor Emission Rate of Concrete Subfloor Using Anhydrous Calcium Chloride
  .8 ASTM F1913-19 Standard Specification for Vinyl Sheet Floor Covering Without Backing
  .9 ASTM F2170-19a Standard Test Method for Determining Relative Humidity in Concrete Floor Slabs Using in situ Probes.
.2 Underwriters Laboratories of Canada (ULC)
  .1 ULC 102.2-2018 Method of Test for Surface Burning Characteristics of Flooring, Floor Coverings, and Miscellaneous Materials and Assemblies
.3 DIN 51130 Testing of floor coverings - Determination of the anti-slip property - Workrooms and fields of activities with slip danger - Walking method - Ramp test
.4 American Concrete Institute (ACI)
  .1 ACI 302.2R-06 Guide for Concrete Slabs that Receive Moisture-Sensitive Flooring Materials

1.4 Submittals

.1 Make submittals in accordance with Section 01 33 00 – Submittal Procedures.

.2 Product data: Submit manufacturer’s current printed product literature, specifications and installation instructions.

.3 Submit shop drawings, seaming plan, coving details, and manufacturer's technical data, installation and maintenance instructions for flooring and accessories.
  .1 Submit a diagram indicating seam locations and roll direction. Use mitered seam layouts for corners when changing directions 180 degrees (e.g. when running material down corridors which bisect at a right angle), unless approved otherwise.

.4 Samples for Verification: For each type of product indicated, in manufacturer's standard-size samples of each resilient product colour, texture, and pattern required.

1.5 Quality Assurance

.1 Select an installer who is competent in the installation of resilient sheet flooring using heat-welded seams.

.2 Provide types of flooring and accessories supplied by one manufacturer, including leveling and patching compounds, and adhesives.

.3 Provide flooring material to meet the following fire test performance criteria as tested by a recognized independent testing laboratory:
.1 ASTM E648 Critical Radiant Flux of 0.45 watts per cm^2 or greater, Class I.
.2 ASTM E662 (Smoke Generation) Maximum Specific Optical Density of 450 or less.

1.6 Shipping, Handling and Storage

.1 Refer to Section 01 61 00 – Common Product Requirements.

.2 Deliver, handle and store materials in accordance with manufacturer's printed instructions.

.3 Store resilient products and installation materials in dry spaces protected from the weather, with ambient temperatures maintained within range recommended by manufacturer, but not less than 13° C or more than 29° C.

1.7 Project Conditions

.1 Install flooring and accessories after the other finishing operations, including painting, have been completed. Close spaces to traffic during the installation of the flooring. Do not install flooring over concrete slabs until they are sufficiently dry to achieve a bond with the adhesive, in accordance with the manufacturer's recommended bond and moisture tests.

.2 Maintain ambient temperatures within range recommended by manufacturer, but not less than 18° C or more than 29° C in spaces to receive resilient products during the following time periods:
.1 48 hours before installation.
.2 During installation.
.3 48 hours after installation.

.3 Maintain the ambient relative humidity between 40% and 60% during installation.

.4 Until Substantial Performance, maintain ambient temperatures within range recommended by manufacturer, but not less than 13° C or more than 29° C.

1.8 Waste Management and Disposal

.1 Refer to Section 01 74 19 – Construction Waste Management and Disposal.

1.9 Warranty

.1 Warrant the work of this Section against defects of workmanship and material, for a period of ten years from the date of Substantial Performance and agree to make good promptly any defects which occur or become apparent within the warranty period.

PART 2 PRODUCTS

2.1 Resilient Sheet Vinyl Safety Flooring

.1 Vinyl sheet safety flooring shall meet requirements of ASTM F1913.

.2 Manufacturer: Tarkett

.3 VCT ll – Pure White 480 or approved equivalent
- .1 Slip Resistance ASTM D2047 .88 Dry, 1.03 Wet
- .2 Thickness: 2 mm
- .3 Static coefficient of friction: ASTM D2047: .78 dry, .8 wet
- .4 Static Load limit: ASTM F970: 1000 psi.
- .5 Colour: Pure White

2.2 Wall Base Materials

.1 Integral flash cove base: Provide integral flash cove wall base by extending sheet 102 mm up the wall using adhesive, welding rod, and accessories recommended and approved by the flooring manufacturer.

.2 Use flash cove base for all Sheet Vinyl Flooring supplied under this Section.

.3 Wall base to be Tarkett Traditional Charcoal or approved equivalent.

2.3 Adhesives

.1 Provide high-performance epoxy flooring adhesive for field areas and flash cove adhesive at flash coving as recommended by the flooring manufacturer.

.2 Provide seam adhesive at seams as recommended by the resilient flooring manufacturer.

2.4 Accessories

.1 For patching, smoothing, and leveling monolithic subfloors, provide fast-setting cement-based patch and underlayment as recommended by the resilient flooring manufacturer.

.2 For sealing joints between the top of wall base or integral cove cap and irregular wall surfaces such as masonry, provide plastic filler applied according to the manufacturer's recommendations.

.3 Provide top edge trim caps of anodized aluminum for integral flash cove as approved by the Consultant.

.4 Provide a fillet support strip for integral cove base with a minimum radius of 25 mm of wood or plastic.

.5 Provide transition/reducing strips tapered to meet abutting materials.

.6 Provide threshold of thickness and width as shown on the drawings.

.7 Provide resilient edge strips of width shown on the drawings, of equal gauge to the flooring, homogeneous vinyl or rubber composition, tapered or bullnose edge, with colour to match or contrast with the flooring, or as selected by the Consultant from standard colours available.

.8 Provide metal edge strips of required width and thickness to protect exposed edges of the flooring. Provide units of maximum available length to minimize the number of joints. Use butt-type metal edge strips for concealed anchorage, or overlap-type metal edge strips for exposed anchorage. Unless otherwise shown, provide strips made of extruded aluminum with a mill finish.

PART 3 EXECUTION

3.1 Inspection

.1 Remove existing sheet flooring and base clean subfloor of all adhesives and patching compounds.

.2 Examine subfloors prior to installation to determine that surfaces are smooth and free from cracks, holes, ridges, and other defects that might prevent adhesive bond or impair durability or appearance of the flooring material.

.3 Inspect subfloors prior to installation to determine that surfaces are free from curing, sealing, parting and hardening compounds; residual adhesives; adhesive removers; and other foreign materials that might prevent adhesive bond. Visually inspect for evidence of moisture, alkaline salts, carbonation, dusting, mold, or mildew.

.4 Report conditions contrary to contract requirements that would prevent a proper installation. Do not proceed with the installation until unsatisfactory conditions have been corrected.

.5 Failure to call attention to defects or imperfections will be construed as acceptance and approval of the subfloor. Installation indicates acceptance of substrates with regard to conditions existing at the time of installation.

3.2 Preparation

.1 Smooth concrete surfaces, removing rough areas, projections, ridges, and bumps, and filling low spots, control or construction joints, and other defects with fast-setting cement-based patch and underlayment as recommended by the flooring manufacturer.

.2 Remove paint, varnish, oils, release agents, sealers, and waxes. Remove residual adhesives as recommended by the flooring manufacturer. Remove curing and hardening compounds not compatible with the adhesives used, as indicated by a bond test or by the compound manufacturer's recommendations for flooring. Avoid organic solvents.

.3 Perform subfloor moisture testing in accordance with ASTM F1869 and Bond Tests as described in manufacturer’s installation guidelines to determine if surfaces are dry; free of curing and hardening compounds, old adhesive, and other coatings; and ready to receive flooring. Relative humidity shall not exceed 80%. MVER shall not exceed 5 lbs./1000 sq. ft./24 hrs. On installations where both the Percent Relative Humidity and the Moisture Vapor Emission Rate tests are conducted, results for both tests shall comply with the allowable limits listed above. Do not proceed with flooring installation until results of moisture tests are acceptable. All test results shall be documented and retained.

.4 Perform pH tests on concrete floors regardless of their age or grade level. All test results shall be documented and retained.

.5 Vacuum or broom-clean surfaces to be covered immediately before the application of flooring. Make subfloor free from dust, dirt, grease, and all foreign materials.

3.3 Installation of Sheet Flooring

.1 Install flooring in strict accordance with the latest edition of manufacturer’s installation instructions.

.2 Install flooring wall to wall before the installation of floor-set cabinets, casework, furniture, equipment, movable partitions, etc. Extend flooring into toe spaces, door recesses, closets, and similar openings as shown on the drawings.

.3 If required, install flooring on pan-type floor access covers. Maintain continuity of colour and pattern within pieces of flooring installed on these covers. Adhere flooring to the subfloor around covers and to covers.

.4 Scribe, cut, and fit or flash cove to permanent fixtures, columns, walls, partitions, pipes, outlets, and built-in furniture and cabinets.

.5 Adhere flooring to the subfloor without cracks, voids, raising and puckering at the seams. Roll with a 45.36 kilogram roller in the field areas. Hand-roll flooring at the perimeter and the seams to assure adhesion. Refer to specific rolling instructions of the flooring manufacturer.

.6 Lay flooring to provide a minimum number of seams. Avoid cross seams, filler pieces, and strips. Match edges for colour shading and pattern at the seams in compliance with the manufacturer's recommendations.

.7 Install flooring with adhesives, tools, and procedures in strict accordance with the manufacturer's written instructions. Observe the recommended adhesive trowel notching, open times, and working times.

.8 Prepare heat-welded seams with special routing tool supplied for this purpose and heat weld with vinyl welding rod in seams. Use methods and sequence of work in conformance with written instructions of the flooring manufacturer. Finish all seams flush and free from voids, recesses, and raised areas.

.9 Provide integral flash cove wall base, including cove fillet support strip and top edge cap trim. Construct flash cove base in accordance with the flooring manufacturer's instructions. Heat-weld seams as specified for those on the floor.

3.4 Installation of Accessories

.1 Apply top set wall base to walls, columns, casework, and other permanent fixtures in areas where top-set base is required. Install base in lengths as long as practical, with inside corners fabricated from base materials that are mitered or coped. Tightly bond base to vertical substrate with continuous contact at horizontal and vertical surfaces.

.2 Fill voids with plastic filler along the top edge of the resilient wall base or integral cove cap on masonry surfaces or other similar irregular substrates.

.3 Place resilient edge strips tightly butted to flooring, and secure with adhesive recommended by the edge strip manufacturer. Install edge strips at edges of flooring that would otherwise be exposed.

.4 Apply metal edge strips, after flooring installation. Secure units to the substrate, complying with the edge strip manufacturer's recommendations.

3.5 Cleaning

.1 Proceed in accordance with Section 01 74 10 – Cleaning.

.2 Perform initial maintenance according to manufacturer's instructions.

.3 Protect installed flooring as recommended by the flooring manufacturer against damage from rolling loads, other trades, or the placement of fixtures and furnishings.

End of Section

PART 1 GENERAL

1.1 General

.1 Conform to the requirements of Division 1.

1.2 Related Sections

.1 Section 03 30 00 Cast-in-Place Concrete
.2 Section 07 26 00 Vapour Retarders

1.3 References

.1 ASTM International (ASTM)
  .1 ASTM C150/C150M-17 Standard Specification for Portland Cement
  .2 ASTM C171-16 Standard Specification for Sheet Materials for Curing Concrete
  .3 ASTM C241/C241M-15e1 Standard Test Method for Abrasion Resistance of Stone Subjected to Foot Traffic
  .4 ASTM C309-11 Standard Specification for Liquid Membrane-Forming Compounds for Curing Concrete
  .5 ASTM C33/C33M-16e1 Standard Specification for Concrete Aggregates
.2 Canadian General Standards Board (CGSB)
  .1 CAN/CGSB 51.34-M86 Vapour Barrier, Polyethylene Sheet for Use in Building Construction
.3 Canadian Standards Association (CSA)
  .1 CAN/CSA-A8/A5/A362, Portland Cement / Masonry Cement / Blended Hydraulic Cement.
  .2 CSA A23.1-04/A23.2-04 Concrete Materials and Methods of Concrete Construction/Methods of Test for Concrete.
.4 Terrazzo Tile and Marble Association of Canada (TTMAC)
  .1 TTMAC 09 66 00 Terrazzo Installation Manual 2009/2010 Edition.
  .2 TTMAC Colour Plates.

1.4 Submittals

.1 Make submittals in accordance with Section 01 33 00 – Submittal Procedures.

.2 Submit shop drawings indicating the type, size, and layout of divider strips and control joint strips and colour of floor areas.

.3 Submit product data for divider strips, control joint strips and expansion joints.

.4 Samples
  .1 Submit two samples 300 x 300 mm in size illustrating colour, chip size and variation, mortar colour, and ground top surface of divider strip. All samples shall be prepared to match existing terrazzo flooring.

.5 Maintenance Data
  .1 Submit cleaning and maintenance data, including procedures for stain removal, stripping, sealing and finishing in accordance with TTMAC Maintenance Guide.
  .2 Submit four (4) copies of the latest edition of the TTMAC Maintenance Guide for inclusion in the Operations and Maintenance manuals specified in Section 01 78 00 – Closeout Submittals. Give specific warning of any maintenance practice or materials that may damage or disfigure the finished work, or alter the coefficient of friction (slip resistance) of the finished surface.

1.5 Quality Control

.1 Provide mockup of one (1) m^2 of terrazzo flooring and one (1) lineal metre of base.

.2 Install mock up in area designated by the Consultant.

.3 When accepted, mock up shall demonstrate minimum standard for work of this Section. Accepted mock up may remain as part of the Work.

1.6 Quality Assurance

.1 Installer: employ skilled mechanics/applicators, trained and experienced in terrazzo work with a minimum of three years proven experience. If requested by Consultant, submit a listing of at least three previously completed projects of similar size and scope.

1.7 Shipping, Handling and Storage

.1 Refer to Section 01 61 00 – Common Product Requirements.

.2 Materials shall be delivered in the manufacturer's unopened containers marked with the brand name. Materials shall be delivered, handled, and stored in accordance with manufacturer’s instructions in a manner that will prevent deterioration and contamination.

1.8 Environmental Requirements

.1 Areas to receive terrazzo shall be maintained at a temperature above 10°C.

.2 Maintain this temperature range for 24 hours before, during and 72 hours after installation of terrazzo.

1.9 Waste Management and Disposal

.1 Refer to Section 01 74 19 – Construction Waste Management and Disposal.

1.10 Warranty

.1 One year from date of Substantial Performance.

PART 2 PRODUCTS

2.1 General

.1 Portland Cement: ASTM C150, Type I or CAN/CSA A5 93 Type 10 Normal, white colour for topping mix or as required to match selected TTMAC colour plate, grey colour for underbed, modified to higher compressive strength requirements of 27.5 MPa, obtained from single source.

.2 Sand: Sand shall conform to ASTM C33 for fine aggregate.

.3 Colourants shall be alkali-resistant and nonfading. Pigments shall be of colours required to match selected TTMAC colour plate.

.4 Marble chips shall be of domestic origin of sizes and colours required to match TTMAC colour plate selected. Marble chips shall have an abrasive hardness of not less than 10 when tested in accordance with ASTM C241/C241M; shall contain no deleterious or foreign matter; and the dust content shall be less than one percent by weight.

.5 Epoxy Bonding Agent: Two component epoxy, bond strength of 2 MPa to failure with 20 MPa concrete.

.6 Water: Potable.

2.2 Accessories

.1 Reinforcing Mesh: CSA G30.5 50 x 50 x 1.5 mm, galvanized.

.2 Divider Strips: In accordance with TTMAC Guides, inverted T shape, zinc coated steel or stainless steel, depth to suit, with anchoring features. Colour and thickness to match existing.

.3 Control Joint Strips: 3 mm nominal width, zinc top strips, zinc coated steel bottom strip, 3 mm wide neoprene filler strip between side strips, with anchoring features.

.4 Base Caps, Base Divider Strips, and Separator Strips: Match divider strips.

.5 Foam Filler: Closed cell urethane foam, capable of compression to 50% of its thickness with full recovery.

.6 Curing material shall be either liquid membrane-forming compound, wet sand, polyethylene sheeting, or water. Liquid membrane-forming compound shall conform to ASTM C309, Type I. Polyethylene sheeting shall conform to ASTM C171.

.7 Terrazzo Cleaner: TTMAC 1001, 1002, 1003, or 1104 as applicable. Terrazzo cleaner shall be biodegradable, phosphate free and shall have a pH factor between 7 and 10 and be of a type specially prepared for use on terrazzo. Submit maintenance instructions for bonded terrazzo.

.8 Sealer: Colourless, liquid, penetrating type to completely seal cementitious matrix surface, specially prepared for use on terrazzo and not detrimental to terrazzo components. Sealer must be UL listed as slip resistant.

PART 3 EXECUTION

3.1 Inspection

.1 Examine the areas in which the work of this section is to be installed and verify that substrates are ready to receive terrazzo work.

.2 Do not begin terrazzo work until concrete substrate has cured 28 days, minimum.

.3 Do not proceed with installation of terrazzo topping until improper conditions have been corrected.

.4 Protect work during installation and protect finished surfaces while other work is being executed in the area.

.5 Check for appropriate heating facilities and required working conditions.

3.2 Terrazzo Proportions

.1 Underbed shall be composed of one part Portland cement to 4 parts sand. Water shall be added to provide workability at as low a slump as possible. Spread to a level 13 mm below the finished floor, to a thickness of approximately 30 mm

.2 Terrazzo Topping shall be composed of one 43 kg bag of Portland cement per 91 kg of marble chips and approximately 20 L of water. Colour pigment shall be added as needed but not to exceed 1 kg per bag of cement. Water shall be added in sufficient quantity to provide workability at as low a slump as possible.

3.3 Installation

.1 Install terrazzo flooring, base and all accessories in accordance with TTMAC guidelines and recommendations.

.2 Underbed Placement: Surfaces of concrete subfloor shall be cleaned and saturated with water in accordance with TTMAC Installation Manual. Do not treat concrete substrate to receive bonded terrazzo with curing agent or additives which would preclude bonding. Excess water shall be removed from the subfloor before slushing and brooming with neat cement paste. The underbed shall be placed on the concrete subfloor and shall be screeded to an elevation 13 mm below the finished floor. Divider strips shall be installed in the semi-plastic underbed. The underbed shall be firmly troweled along the edges to insure positive anchorage of the divider strips. Control joint strips shall be installed over subfloor expansion joints and shall extend the full depth of the underbed.

.3 Set divider strips in accordance with layout indicated while underbed is still plastic. Set strips to straight lines and to the proper level to ensure that tops of strips will show uniformly after completing grinding and finishing operations. Fit joints and intersections tight. Where divisions in field work are not shown, divide field work into squares or rectangles of uniform size and not more than 1800 mm on a side. Divide borders by strips to coincide with the layout of division strips in the field of floors. Place edging strips at doorways between terrazzo and other types of flooring and along the edges of terrazzo borders adjoining other types of floor finishes or floor coverings. Place expansion strips over control joints, construction joints, and expansion joints.

.4 Placing Terrazzo Topping: The underbed shall be slushed and broomed in accordance with TTMAC Installation Manual with neat cement paste of the same colour as required for the topping. The topping shall be placed in panels formed by divider strips and shall be troweled level with the top of the strips. The troweled surface shall be seeded with chips in the same colour proportions as contained in the terrazzo mix, troweled and rolled with heavy rollers until excess water has been extracted. The terrazzo shall be troweled to a uniform surface disclosing the lines of the divider strips.

3.4 Curing

.1 The terrazzo shall be cured until the topping develops sufficient strength to prevent lifting or pulling of terrazzo chips during grinding. Keep the completed terrazzo continuously moist and free of traffic during the curing period. Cure by covering with a liquid membrane-forming compound, sheet materials, wet sand, or sprinkling with water.

3.5 Finishing

.1 Finish terrazzo to TTMAC instructions.

.2 Grind entire floor in Existing Lobby and corridor area including all existing terrazzo to remain, and refinish as specified herein.

.3 After curing the grout coat for a minimum of 72 hours, grind the floor using a No. 80 or finer grit stone. In the latter stages of grinding, use grit stones or other abrasive in the grinding machine of a grain or fineness that will give the surface a honed finish. Grind and rub by hand small areas,

inaccessible portions, and corners that cannot be reached by the grinding machine. The honed surface of finished terrazzo shall show not less than 70 percent of the area as exposed aggregate evenly distributed, and shall conform in appearance to the approved samples. Finished thickness of terrazzo topping shall be a minimum of 13 mm.

3.6 Allowable Tolerances

.1 Maximum Variation from Flat Surface: 3 mm in 1 m.

.2 Maximum Variation from Level: 3 mm, in 3 m.

3.7 Rough Grinding

.1 After topping has cured, the terrazzo shall be machine ground using the wet method, to a true even surface using No. 24 or finer grit followed by No. 80 grit or finer grit stone. Finish floor surface shall not vary by more than 2 mm/meter.

3.8 Grouting

.1 After rough grinding, the floor shall be cleansed with clean water and rinsed. After removing excess rinse water, the floor shall be grouted using identical Portland cement, colour and pigments as used in the topping taking care to fill voids. After the grout has attained its initial set, the surface shall be cured for a minimum of 72 hours.

3.9 Fine Grinding

.1 After grout has cured, the surface shall be ground with fine grit stones until all grout is removed from the surface. Upon completion of grinding, the terrazzo flooring shall show a minimum of 70 percent of marble chips.

3.10 Protection

.1 The terrazzo work shall be covered and protected from damage until completion of the work of all other trades.

3.11 Cleaning

.1 Proceed in accordance with Section 01 74 11 – Cleaning.

.2 Cleaning and Sealing: Refer to latest edition of TTMAC Maintenance Guide. Sealers should be ULC listed as slip resistant. sealer shall be applied in accordance with the manufacturer's directions

End of Section

PART 1 GENERAL

1.1 General

.1 Conform to the requirements of Division 1.

1.2 Related Sections

.1 Section 04 22 00 Concrete Unit Masonry
.2 Section 05 50 00 Metal Fabrications
.3 Section 06 20 00 Finish Carpentry
.4 Section 08 11 00 Metal Doors and Frames
.5 Section 09 21 16 Gypsum Board

1.3 References

.1 Department of Justice Canada (Jus)
  .1 Canadian Environmental Protection Act (CEPA), 1999, c. 33
.2 Environmental Protection Agency (EPA)
  .1 EPA Test Method for Measuring Total Volatile Organic Compound Content of Consumer Products, Method 24 - 1995, (for Surface Coatings).
.3 Health Canada / Workplace Hazardous Materials Information System (WHMIS)
  .1 Material Safety Data Sheets (MSDS).
.4 Master Painters Institute (MPI)
  .1 MPI Architectural Painting Specifications Manual, 2004.
.5 National Fire Code of Canada - 1995
.6 Society for Protective Coatings (SSPC)
  .1 SSPC Painting Manual, Volume Two, 8th Edition, Systems and Specifications Manual.
.7 Transport Canada (TC)
  .1 Transportation of Dangerous Goods Act (TDGA), 1992, c. 34.
.8 South Coast Air Quality Management District, California State (SCAQMD)
  .1 SCAQMD Rule 1113-96, Architectural Coatings.
.9 Green Seal GS-11 Green Seal Environmental Standard for Paints and Coatings, January 1997.

1.4 Submittals

.1 Make submittals in accordance with Section 01 33 00 – Submittal Procedures.

.2 Product Data:
  .1 Submit product data and instructions for each paint and coating product to be used.
  .2 Submit product data for the use and application of paint thinner.
  .3 Submit two copies of Workplace Hazardous Materials Information System (WHMIS) Material Safety Data Sheets (MSDS) in accordance with Section 01 33 00 - Submittal Procedures. Indicate VOCs during application and curing.

.3 Samples:
  .1 Submit full range colour sample chips to indicate where colour availability is restricted.
  .2 Submit duplicate 200 x 300 mm sample panels of each paint, stain, clear coating and special finish with specified paint or coating in colours, gloss/sheen and textures required to MPI Architectural Painting Specification Manual standards.
  .3 Retain reviewed samples on-site to demonstrate acceptable standard of quality for appropriate on-site surface.

.4 Test reports: submit certified test reports for paint from approved independent testing laboratories, indicating compliance with specifications for specified performance characteristics and physical properties.
  .1 Lead, cadmium and chromium: presence of and amounts.
  .2 Mercury: presence of and amounts.
  .3 Organochlorines and PCBs: presence of and amounts.

.5 Certificates: submit certificates signed by manufacturer certifying that materials comply with specified performance characteristics and physical properties and SCAQMD Rule 1113-96.

.6 Manufacturer's Instructions:
  .1 Submit manufacturer's installation and application instructions.

.7 Closeout Submittals: submit maintenance data for incorporation into manual specified in Section 01 78 00 - Closeout Submittals include following:
  .1 Product name, type and use.
  .2 Manufacturer's product number.
  .3 Colour numbers.
  .4 MPI Environmentally Friendly classification system rating.

1.5 Quality Assurance

.1 Qualifications:
  .1 Contractor: minimum of five years proven satisfactory experience.
  .2 Journeymen: qualified journeymen who have "Tradesman Qualification Certificate of Proficiency" engaged in painting work.

.2 Apprentices: working under direct supervision of qualified tradesperson in accordance with trade regulations.

.3 Mock-Ups:
  .1 Construct mock-ups in accordance with Section 01 45 00 - Quality Control.
  .2 Prepare and paint designated surface, area, room or item (in each colour scheme) to specified requirements, with specified paint or coating showing selected colours, gloss/sheen and textures.
  .3 Mock-up will be used:
    .1 To judge workmanship, substrate preparation, operation of equipment and material application and workmanship to MPI Architectural Painting Specification Manual standards.
  .4 Locate where directed.
  .5 Allow 24 hours for inspection of mock-up before proceeding with work.
  .6 When accepted, mock-up will demonstrate minimum standard of quality required for this work. Approved mock-up may remain as part of finished work.

.4 Health and Safety: Do construction occupational health and safety in accordance with Section 01 35 29.06 - Health and Safety Requirements.

1.6 Scheduling

.1 Submit work schedule for various stages of painting to Owner and Consultant for review.

.2 Submit schedule minimum of 48 hours in advance of proposed operations.

.3 Schedule painting in the Bowmanville High School with the Owner and the Kawartha Pine Ridge District School Board.

1.7 Shipping, Handling and Storage

.1 Refer to Section 01 61 00 – Common Product Requirements.

.2 Deliver, handle and store materials in accordance with manufacturer's printed instructions.

.3 Acceptance at Site:
- .1 Identify products and materials with labels indicating:
  - .1 Manufacturer's name and address.
  - .2 Type of paint or coating.
- .2 Compliance with applicable standard.
- .3 Colour number in accordance with established colour schedule.

.4 Remove damaged, opened and rejected materials from site.

.5 Storage and Protection:
- .1 Provide and maintain dry, temperature controlled, secure storage.
- .2 Store materials and supplies away from heat generating devices.
- .3 Store materials and equipment in well-ventilated area with temperature range 7 degrees C to 30 degrees C.

.6 Store temperature sensitive products above minimum temperature as recommended by manufacturer.

.7 Keep areas used for storage, cleaning and preparation clean and orderly. After completion of operations, return areas to clean condition.

.8 Remove paint materials from storage only in quantities required for same day use.

1.8 Fire Safety Requirements

.1 Provide one 9 kg Type ABC dry chemical fire extinguisher adjacent to storage area.

.2 Store oily rags, waste products, empty containers and materials subject to spontaneous combustion in ULC approved, sealed containers and remove from site on a daily basis.

.3 Handle, store, use and dispose of flammable and combustible materials in accordance with National Fire Code of Canada requirements.

1.9 Waste Management and Disposal

.1 Refer to Section 01 74 19 – Construction Waste Management and Disposal.

.2 Remove from site and dispose of packaging materials at appropriate recycling facilities.

.3 Collect and separate for disposal packaging material in appropriate on-site bins for recycling in accordance with Waste Management Plan (WMP).

.4 Separate for reuse and recycling and place in designated containers waste in accordance with Waste Management Plan (WMP).

.5 Place materials defined as hazardous or toxic in designated containers.

.6 Handle and dispose of hazardous materials in accordance with Regional and Municipal regulations.

.7 Ensure emptied containers are sealed and stored safely.

.8 Unused materials must be disposed of at official hazardous material collections site as approved by Owner.

.9 Paint, stain and wood preservative finishes and related materials (thinners, and solvents) are regarded as hazardous products and are subject to regulations for disposal. Information on these controls can be obtained from Provincial Ministries of Environment and Regional levels of Government.

.10 Material which cannot be reused must be treated as hazardous waste and disposed of in an appropriate manner.

.11 Place materials defined as hazardous or toxic waste, including used sealant and adhesive tubes and containers, in containers or areas designated for hazardous waste.

.12 To reduce the amount of contaminants entering waterways, sanitary/storm drain systems or into ground follow these procedures:
- .1 Retain cleaning water for water-based materials to allow sediments to be filtered out.
- .2 Retain cleaners, thinners, solvents and excess paint and place in designated containers and ensure proper disposal.
- .3 Return solvent and oil soaked rags used during painting operations for contaminant recovery, proper disposal, or appropriate cleaning and laundering.
- .4 Dispose of contaminants in approved legal manner in accordance with hazardous waste regulations.
- .5 Empty paint cans are to be dry prior to disposal or recycling (where available).

.13 Where paint recycling is available, collect waste paint by type and provide for delivery to recycling or collection facility.

1.10 Maintenance

.1 Extra Materials:
- .1 Deliver to extra materials from same production run as products installed. Package products with protective covering and identify with descriptive labels. Comply with Section 01 78 00 - Closeout Submittals.
- .2 Quantity: provide one four litre can of each type and colour of primer stain finish coating. Identify colour and paint type in relation to established colour schedule and finish system.
- .3 Delivery, storage and protection: comply with Consultant's requirements for delivery and storage of extra materials.

1.11 Ambient Conditions

.1 Heating, Ventilation and Lighting:
- .1 Ventilate enclosed spaces in accordance with Section 01 51 00 – Temporary Utilities.
- .2 Provide heating facilities to maintain ambient air and substrate temperatures above 10 degrees C for 24 hours before, during and after paint application until paint has cured sufficiently.
- .3 Provide continuous ventilation for seven days after completion of application of paint.
- .4 Provide temporary ventilating and heating equipment where permanent facilities are not available or supplemental ventilating and heating equipment if ventilation and heating from existing system is inadequate to meet minimum requirements.

.5 Provide minimum lighting level of 323 Lux on surfaces to be painted.

.2 Temperature, Humidity and Substrate Moisture Content Levels:
.1 Unless pre-approved written approval by Specifying body Paint Inspection Agency Authority and product manufacturer, perform no painting when:
.1 Ambient air and substrate temperatures are below 10 degrees C.
.2 Substrate temperature is above 32 degrees C unless paint is specifically formulated for application at high temperatures.
.3 Substrate and ambient air temperatures are not expected to fall within MPI or paint manufacturer's prescribed limits.
.4 The relative humidity is under 85% or when the dew point is more than 3 degrees C variance between the air/surface temperature. Paint should not be applied if the dew point is less than 3 degrees C below the ambient or surface temperature. Use sling psychrometer to establish the relative humidity before beginning paint work.
.5 Rain or snow are forecast to occur before paint has thoroughly cured or when it is foggy, misty, raining or snowing at site.
.6 Ensure that conditions are within specified limits during drying or curing process, until newly applied coating can itself withstand 'normal' adverse environmental factors.
.2 Perform painting work when maximum moisture content of the substrate is below:
.1 Allow new concrete to cure minimum of 28 days.
.2 15% for wood.
.3 12% for plaster and gypsum board.
.3 Test for moisture using calibrated electronic Moisture Meter. Test concrete floors for moisture using "cover patch test".
.4 Test concrete and plaster surfaces for alkalinity as required.
.5 Surface and Environmental Conditions:
.1 Apply paint finish in areas where dust is no longer being generated by related construction operations or when wind or ventilation conditions are such that airborne particles will not affect quality of finished surface.
.2 Apply paint to adequately prepared surfaces and to surfaces within moisture limits.
.3 Apply paint when previous coat of paint is dry or adequately cured.
.6 Additional interior application requirements:
.1 Apply paint finishes when temperature at location of installation can be satisfactorily maintained within manufacturer's recommendations.

Part 2 Products

2.1 Materials

.1 Products to meet requirements of GS-03, GS-11 or SCAQMD Rule 1113-96

.2 Paint materials listed in the MPI Approved Products List (APL) are acceptable for use on this project.

.3 Provide paint materials for paint systems from single manufacturer.

.4 Only qualified products with E2 or E3 "Environmentally Friendly" rating are acceptable for use on this project.

.5 Conform to latest MPI requirements for interior painting work including preparation and priming.

.6 Materials (primers, paints, coatings, varnishes, stains, lacquers, fillers, thinners, solvents, etc.) in accordance with MPI Architectural Painting Specification Manual "Approved Product" listing.

.7 Linseed oil, shellac, and turpentine: highest quality product from approved manufacturer listed in MPI Architectural Painting Specification Manual, compatible with other coating materials as required.

.8 Paints, coatings, adhesives, solvents, cleaners, lubricants, and other fluids:
- .1 Water-based, Water clean-up.
- .2 Non-flammable, biodegradable.
- .3 Manufactured without compounds which contribute to ozone depletion in the upper atmosphere.
- .4 Manufactured without compounds which contribute to smog in the lower atmosphere.
- .5 Do not contain methylene chloride, chlorinated hydrocarbons or toxic metal pigments.
- .6 Recycled content of 15% post-consumer and ½ post-industrial waste.

.9 Formulate and manufacture water-borne surface coatings with no aromatic solvents, formaldehyde, halogenated solvents, mercury, lead, cadmium, hexavalent chromium or their compounds.

.10 Flash point: 61°C or greater for water-borne surface coatings and recycled water-borne surface coatings.

.11 Ensure manufacture and process of both water-borne surface coatings and recycled water-borne surface coatings does not release:
- .1 Matter in undiluted production plant effluent generating 'Biochemical Oxygen Demand' (BOD) in excess of 15 mg/L to natural watercourse or sewage treatment facility lacking secondary treatment.
- .2 Total Suspended Solids (TSS) in undiluted production plant effluent in excess of 15 mg/L to natural watercourse or a sewage treatment facility lacking secondary treatment.

.12 Recycled water-borne surface coatings to contain 50% post-consumer material by volume.

.13 Recycled water-borne surface coatings must not contain:
- .1 Lead in excess of 600.0 ppm weight/weight total solids.
- .2 Mercury in excess of 50.0 ppm weight/weight total product.
- .3 Cadmium in excess of 1.0 ppm weight/weight total product.
- .4 Hexavelant chromium in excess of 3.0 ppm weight/weight total product.
- .5 Organochlorines or polychlorinated biphenyls (PCBS) in excess of 1.0 ppm weight/weight total product.

2.2 Colours

.1 Consultant will provide Colour Schedule.

.2 Colour schedule will be based upon selection of eight base colours and six deep tint accent colours.

.3 Selection of colours will be from manufacturer’s full range of colours.

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

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

2.3 Mixing and Tinting

.1 Perform colour tinting operations prior to delivery of paint to site.

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

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

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

2.4 Gloss/Sheen Ratings

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

Gloss Level Category/	Units @ 60 Degrees/	Units @ 85 Degrees/
G1 – matte finish	0 to 5	Max. 10
G2 – velvet finish	0 to 10	10 to 35
G3 – eggshell finish	10 to 25	10 to 35
G4 – satin finish	20 to 35	Min. 35
G5 – semi-gloss finish	35 to 70	
G6 – gloss finish	70 to 85	
G7 – high gloss finish	> 85	

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

2.5 Interior Painting Systems

.1 Concrete masonry units:
.1 INT 4.2D High performance architectural latex G5 semi-gloss finish.

.2 Metal Fabrications:
.1 INT 5.3A Latex G5 semi-gloss finish

.3 Galvanized metal: interior doors, frames, railings, misc. steel, pipes, and ducts.
.1 INT 5.3A Latex G5 semi-gloss finish

.4 Wood Paint Finish:
.1 INT 6.3A high performance architectural latex G5 semi-gloss finish

.5 Wood Clear Polyurethane Finish:
.1 INT 6.3K Polyurethane varnish G6 gloss finish.

.6 Gypsum Board: walls and bulkheads.
.1 INT 9.2A Latex G3 eggshell finish over latex sealer.

.7 Gypsum Board: Ceilings and Bulkheads:
.1 INT 9.2A Latex G2 velvet finish over latex sealer.

.8 All other surfaces not noted above: high performance finish suitable for wet and institutional environment and in accordance with MPI painting manual.

PART 3 EXECUTION

3.1 Manufacturer's Instructions

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

3.2 General

.1 Perform preparation and operations for interior painting in accordance with MPI Architectural Painting Specifications Manual except where specified otherwise.

.2 Apply paint materials in accordance with paint manufacturer's written application instructions.

3.3 Examination

.1 Investigate existing substrates for problems related to proper and complete preparation of surfaces to be painted. Report to Consultant damages, defects, unsatisfactory or un-favourable conditions before proceeding with work.

.2 Conduct moisture testing of surfaces to be painted using properly calibrated electronic moisture meter, except test concrete floors for moisture using simple "cover patch test". Do not proceed with work until conditions fall within acceptable range as recommended by manufacturer.

.3 Maximum moisture content as follows:
  .1 Plaster and gypsum board: 12%.
  .2 Concrete: 12%.
  .3 Wood: 15%.

3.4 Preparation

.1 Protection:
  .1 Protect existing building surfaces and adjacent structures from paint spatters, markings and other damage by suitable non-staining covers or masking. If damaged, clean and restore surfaces as directed by Consultant.
  .2 Protect items that are permanently attached such as Fire Labels on doors and frames.
  .3 Protect factory finished products and equipment.

.2 Surface Preparation:
  .1 Remove electrical cover plates, light fixtures, surface hardware on doors, bath accessories and other surface mounted equipment, fittings and fastenings prior to undertaking painting operations. Identify and store items in secure location and re-installed after painting is completed.
  .2 Move and cover furniture and portable equipment as necessary to carry out painting operations. Replace as painting operations progress.
  .3 Place "WET PAINT" signs in occupied areas as painting operations progress.

.3 Clean and prepare surfaces in accordance with MPI Architectural Painting Specification Manual requirements. Refer to MPI Manual in regard to specific requirements and as follows:
  .1 Remove dust, dirt, and other surface debris by vacuuming, wiping with dry, clean cloths, or compressed air.
  .2 Wash surfaces with a biodegradable detergent and bleach where applicable and clean warm water using a stiff bristle brush to remove dirt, oil and other surface contaminants.
  .3 Rinse scrubbed surfaces with clean water until foreign matter is flushed from surface.
  .4 Allow surfaces to drain completely and allow to dry thoroughly.

.5 Prepare surfaces for water-based painting, water-based cleaners should be used in place of organic solvents.
.6 Use trigger operated spray nozzles for water hoses.
.7 Many water-based paints cannot be removed with water once dried. Minimize use of mineral spirits or organic solvents to clean up water-based paints.

.4 Prevent contamination of cleaned surfaces by salts, acids, alkalis, other corrosive chemicals, grease, oil and solvents before prime coat is applied and between applications of remaining coats. Apply primer, paint, or pretreatment as soon as possible after cleaning and before deterioration occurs.

.5 Where possible, prime non-exposed surfaces of new wood surfaces before installation. Use same primers as specified for exposed surfaces.
.1 Apply vinyl sealer to MPI #36 over knots, pitch, sap and resinous areas.
.2 Apply wood filler to nail holes and cracks.
.3 Tint filler to match stains for stained woodwork.

.6 Sand and dust between coats as required to provide adequate adhesion for next coat and to remove defects visible from a distance up to 1000 mm.

.7 Clean metal surfaces to be painted by removing rust, loose mill scale, welding slag, dirt, oil, grease and other foreign substances in accordance with MPI requirements. Remove traces of blast products from surfaces, pockets and corners to be painted by brushing with clean brushes blowing with clean dry compressed air or vacuum cleaning.

.8 Touch up of shop primers with primer as specified.

.9 Do not apply paint until prepared surfaces have been accepted by Consultant.

3.5 Application

.1 Brush and Roller Application:
.1 Apply paint in uniform layer using brush and/or roller type suitable for application.
.2 Work paint into cracks, crevices and corners.
.3 Paint surfaces and corners not accessible to brush using spray, daubers and/or sheepskins. Paint surfaces and corners not accessible to roller using brush, daubers or sheepskins.
.4 Brush and/or roll out runs and sags, and over-lap marks. Rolled surfaces free of roller tracking and heavy stipple.
.5 Remove runs, sags and brush marks from finished work and repaint.

.2 Spray application:
.1 Provide and maintain equipment that is suitable for intended purpose, capable of atomizing paint to be applied, and equipped with suitable pressure regulators and gauges.
.2 Keep paint ingredients properly mixed in containers during paint application either by continuous mechanical agitation or by intermittent agitation as frequently as necessary.
.3 Apply paint in uniform layer, with overlapping at edges of spray pattern. Back roll first coat application.
.4 Brush out immediately all runs and sags.
.5 Use brushes and rollers to work paint into cracks, crevices and places which are not adequately painted by spray.

.3 Use dipping, sheepskins or daubers only when no other method is practical in places of difficult access.

.4 Apply coats of paint continuous film of uniform thickness. Repaint thin spots or bare areas before next coat of paint is applied.

.5 Allow surfaces to dry and properly cure after cleaning and between subsequent coats for minimum time period as recommended by manufacturer.

.6 Sand and dust between coats to remove visible defects.

.7 Finish surfaces both above and below sight lines as specified for surrounding surfaces.

.8 Finish alcoves as specified for adjoining rooms.

.9 Finish top, bottom, edges and cutouts of doors after fitting as specified for door surfaces.

3.6 Mechanical/Electrical Equipment

.1 Paint finished area exposed conduits, piping, hangers, ductwork and other mechanical and electrical equipment with colour and finish to match adjacent surfaces.

.2 Mechanical and electrical rooms: paint exposed conduits, piping, hangers, ductwork and other mechanical and electrical equipment.

.3 Other unfinished areas: leave exposed conduits, piping, hangers, ductwork and other mechanical and electrical equipment in original finish and touch up scratches and marks.

.4 Touch up scratches and marks on factory painted finishes and equipment with paint as supplied by manufacturer of equipment.

.5 Do not paint over nameplates.

.6 Keep sprinkler heads free of paint.

.7 Paint inside of ductwork where visible behind grilles, registers and diffusers with primer and one coat of matt black paint.

.8 Paint fire protection piping red.

.9 Paint disconnect switches for fire alarm system and exit light systems in red enamel.

.10 Paint natural gas piping yellow.

.11 Paint both sides and edges of backboards for telephone and electrical equipment before installation. Leave equipment in original finish except for touch-up as required, and paint conduits, mounting accessories and other unfinished items.

.12 Do not paint interior transformers and substation equipment.

3.7 Site Tolerances

.1 Walls: no defects visible from a distance of 1000 mm at 90 degrees to surface.

.2 Ceilings: no defects visible from floor at 45 degrees to surface when viewed using final lighting source.

.3 Final coat to exhibit uniformity of colour and uniformity of sheen across full surface area.

3.8 Field Quality Control

.1 Interior painting and decorating work shall be inspected by the Consultant. Notify Consultant a minimum of one week prior to commencement of work.

.2 Where "special" painting, coating or decorating system applications (i.e. elastomeric coatings) or non-MPI listed products or systems are to be used, paint or coating manufacturer shall provide as part of this work, certification of surfaces and conditions for specific paint or coating system application as well as on site supervision, inspection and approval of their paint or coating system application as required at no additional cost to Owner.

.3 Standard of Acceptance:
- .1 Walls: no defects visible from a distance of 1000 mm at 90 degrees to surface.
- .2 Ceilings: no defects visible from floor at 45 degrees to surface when viewed using final lighting source.
- .3 Final coat to exhibit uniformity of colour and uniformity of sheen across full surface area.

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

.5 Cooperate with inspection firm and provide access to areas of work.

.6 Retain purchase orders, invoices and other documents to prove conformance with noted MPI requirements when requested by Consultant.

3.9 Restoration

.1 Clean and re-install hardware items removed before undertaken painting operations.

.2 Remove protective coverings and warning signs as soon as practical after operations cease.

.3 Remove paint splashings on exposed surfaces that were not painted. Remove smears and spatter immediately as operations progress, using compatible solvent.

.4 Protect freshly completed surfaces from paint droppings and dust to approval of Consultant. Avoid scuffing newly applied paint.

.5 Restore areas used for storage, cleaning, mixing and handling of paint to clean condition as approved by Consultant.

3.10 Cleaning

.1 Proceed in accordance with Section 01 74 11 – Cleaning.

End of Section

PART 1 GENERAL

1.1 General

.1 Conform to the requirements of Division 1.

1.2 Related Sections

.1 Section 09 21 16 Gypsum Board

1.3 References

.1 Underwriters Laboratories of Canada (ULC)
  .1 ULC 102-18 Standard Method of Test for Surface Burning Characteristics of Building Materials and Assemblies

1.4 Submittals

.1 Make submittals in accordance with Section 01 33 00 – Submittal Procedures.

.2 Submit shop drawings.
  .1 Show dimensions, layout and details for fabrication and installation of whiteboards, tackboards, aluminum trim and anchorage.

.3 Provide maintenance data for whiteboards and tackboards for incorporation into Operating and Maintenance Manuals specified in Section 01 78 00- Closeout Submittals.

1.5 Shipping, Handling and Storage

.1 Refer to Section 01 61 00 – Common Product Requirements.

.2 Deliver, handle and store materials in accordance with manufacturer's printed instructions.

.3 Use all means necessary to protect whiteboards, tackboards, aluminum trim, during and after installation and to protect the installed work and materials of all other trades.

.4 In the event of damage, immediately make all repairs and replacements necessary to the approval of the Consultant and at no additional cost to the Owner.

1.6 Waste Management and Disposal

.1 Refer to Section 01 74 19 – Construction Waste Management and Disposal.

1.7 Requirements of Regulatory Agencies

.1 Surface burning characteristics of materials: to ULC S102.

1.8 Warranty

.1 Warrant the work of this Section against defects of workmanship and material, for a period of five years from the date of Substantial Performance and agree to make good promptly any defects which occur or become apparent within the warranty period.

PART 2 PRODUCTS

2.1 General

.1 The following manufacturers have been approved for the work of this Section:

.1 Global School Products Inc.

.2 Whiteboards and tackboards shall be supplied by one manufacturer.

2.2 Whiteboards

.1 Basis of design: Rite-On, Wipe Off, magnetic writing boards, white porcelain enamel on steel, factory pre-framed in clear anodized aluminum trim with chalk rail by Global School Products or equivalent.
.1 Sizes as indicated on drawing elevations.

.2 Provide one package of companion writing pens (3 each red, blue, green and black) for each whiteboard.

2.3 Tackboards

.1 Tackboards shall be 13 mm factory pre-laminated consisting of 6.4 mm thick fine grained natural cork laminated to 6.4 mm particle board or masonite substrate under mechanical pressure in maximum panel sizes of 1220 x 2440 mm. Bonding of materials by a waterproof adhesive that will not delaminate or rupture at the contact surfaces.

.2 Basis of design: fine grain natural cork, light textured, brown with satin finished anodized aluminum frame and concealed fasteners, as manufactured by Global School Products Ltd. or equivalent.

.3 Sizes as indicated.

.4 All tackboards shall meet the minimum requirements of the applicable building code and shall have a flame spread rating of under 150 when tested in accordance with ULC 102.

2.4 Projectors

.1 All projectors will be removed ACP Communication Technology. Contractors shall retain ACP to complete the removal and storage of the projects and then re-installation of the projector systems as the renovation work is completed. ACP contact information is below:
.1 ACP Communication Technologies Inc.
885 Main Street East, Unit #6
Milton, Ontario, L9T 5A7
905-876-4026

2.5 Trim

.1 Aluminum trim and chalk trays shall be 6063 T5 aluminum alloy with satin finish clear etched and anodized .05 mm satin finish free from extruding draw marks and surface scratches.
.1 Perimeter: No. 205 trim - 19 mm exposed face and weight of approximately 0.372 kg/m.

.2 Divider Bar No. 207 trim for adjacent panels of elevations greater than 2440 mm - 13 mm exposed face and weight of approximately 0.372 kg/m.
.3 Maprail: No. 206 trim for whiteboard elevation only complete with integral natural fine grained cork insert, end stops and two (2) combination roller maphooks per 1.2 lineal metre or portion thereof, - 50 mm exposed face and weight of approximately 0.520 kg/m.
.4 Tray No. 212 triangular box section for whiteboard elevations only complete with contour fitting and castings - 100 mm projection from wall and weight of approximately 1.42 kg/m.

2.6 Coat Hooks

.1 Coat rack and hooks shall be Global School Products Inc. complete tubeshelf, bracket, channel mount with student coat and hat hooks. Model SCR 1001 or approved equal.

PART 3 EXECUTION

3.1 Coordination

.1 Co-ordinate with all other trades as required to ensure proper and adequate provision in framing and wall finish for the installation of whiteboards and tackboards in the locations required.

.2 Prior to installation, inspect locations of all whiteboards and tackboards and verify that all necessary provisions have been made. In the event of discrepancy, immediately notify the Consultant.

.3 Do not proceed with installation in areas of discrepancy until all such discrepancies have been fully resolved.

3.2 Installation

.1 Install all whiteboards and tackboards where indicated on the drawings and in full accordance with the manufacturer's recommendations, anchoring all components firmly in place for long life under hard use.

.2 Erection of materials shall be carried out to ensure a rigid, straight, square, plumb and horizontal installation.

.3 All aluminum trim to be attached in such a manner that all fastenings shall be concealed. All corners are to be mitred.

3.3 Cleaning

.1 Proceed in accordance with Section 01 74 11 – Cleaning.

.2 All whiteboards, tackboards, and aluminum trim are to be cleaned prior to Substantial Performance.

End of Section

PART 1 GENERAL

1.1 General

.1 Conform to the requirements of Division 1.

1.2 Related Sections

.1 Section 06 10 00 Rough Carpentry
.2 Section 09 21 16 Gypsum Board

1.3 References

.1 ASTM International (ASTM)
  .1 ASTM D1308-20 Standard Test Method for Effect of Household Chemicals on Clear and Pigmented Organic Finishes
  .2 ASTM F476-23 Standard Test Methods for Security of Swinging Door Assemblies
.2 Underwriters Laboratories of Canada (ULC)
  .1 ULC S102.2 Standard Method of Test for Surface Burning Characteristics of Flooring, Floor Coverings, and Miscellaneous Materials and Assemblies

1.4 Submittals

.1 Make submittals in accordance with Section 01 33 00 – Submittal Procedures.

.2 Product data and detailed specifications for each system component and installation accessory required, including installation methods for each type of substrate.

.3 Shop drawings showing locations, extent and installation details of crash rails. Show methods of attachment to adjoining construction.

.4 Samples for verification purposes: Submit the following samples, as proposed for this work, for verification of colour, texture, pattern and end cap attachment and alignment.
  .1 300 mm long sample of each model specified including end cap and mounting hardware.

.5 Product test reports from a qualified independent testing laboratory showing compliance of each component with requirements indicated.

.6 Maintenance data for wall protection system components for inclusion in the operating and maintenance manuals specified in Division 1.

1.5 Quality Assurance

.1 Installer qualifications: Engage an installer who has no less than 3 years of experience in installation of systems similar in complexity to those required for this project.

.2 Manufacturer’s qualifications: Not less than 5 years of experience in the production of specified products and a record of successful in-service performance.

.3 Code compliance: Assemblies shall conform to all applicable codes including IBC, UBC, SBCCI, BOCA and Life Safety.

.4 Fire performance characteristics: Provide engineered PETG wall protection system components tested to ULC S102.2, with results listed below:

.1 Flame spread: 0
.2 Smoke developed: 45

.5 Impact Strength: Provide assembled wall protection units that have been tested in accordance with the applicable provisions of ASTM F476.

.6 Chemical and stain resistance: Provide wall protection system components with chemical and stain resistance in accordance with ASTM D1308.

.7 Single source responsibility: Provide all components of the wall protection system manufactured by the same company.

1.6 Shipping, Handling and Storage

.1 Refer to Section 01 61 00 – Common Product Requirements.

.2 Deliver materials to the project site in unopened original factory packaging clearly labeled to show manufacturer.

.3 Store materials in original, undamaged packaging in a cool, dry place out of direct sunlight and exposure to the elements. A minimum room temperature of 4 ° C and a maximum of 38 ° C should be maintained.

.4 Material must be stored flat.

1.7 Project Conditions

.1 Materials must be acclimated in an environment of 18 ° to 24 ° C for at least 24 hours prior to beginning the installation.

.2 Temperature at the time of installation must be between 18 ° to 24 ° C and be maintained for at least 48 hours after the installation.

.3 Installation areas must be enclosed and weatherproofed before installation commences.

1.8 Waste Management and Disposal

.1 Refer to Section 01 74 19 – Construction Waste Management and Disposal.

PART 2 PRODUCTS

2.1 Manufacturer

.1 Interior surface protection products specified herein shall be manufactured by Construction Specialties, Inc. or approved equivalent.

2.2 Materials

.1 Aluminum: To be 6061-T6 extrusion with clear anodized finish for model ECR-60A; minimum strength and durability properties as specified in ASTM B221.

.2 Fasteners: All fasteners to be non-corrosive and compatible with aluminum retainers.
.1 All necessary fasteners to be supplied by the manufacturer.

2.3 Crash Rails

.1 Heavy duty crash rails to be by CS Acrovyn: Extended mount crash rail lengths to be supplied prefabricated with corners and end returns formed. End returns and corners shall not be separate pieces. All units pre-drilled. Mounting hardware shall be supplied by the manufacturer.

.1 Aluminum crash rail 6" (152.4mm) high x 1/4" (6.4mm) thick with continuous 2" (50.8mm) radiused ends standard, 135° corners available. Outside rail surface shall be no more than 3 1/4" (82.6mm) from wall mounting surface. Tube bracket standard. Specify ECR-60AHB for H-bracket. Brackets are aluminum only. Optional powder coat finish available; select from standard powder coat finishes.

2.4 Fabrication

.1 General: Fabricate wall protection systems to comply with requirements indicated for design, dimensions, detail, finish and member sizes.

PART 3 EXECUTION

3.1 Examination

.1 Verification of conditions: Examine areas and conditions under which work is to be performed and identify conditions detrimental to proper or timely completion.

.2 Do not proceed until unsatisfactory conditions have been corrected.

3.2 Preparation

.1 Surface preparation: Prior to installation, clean substrate to remove dirt, debris and loose particles. Perform additional preparation procedures as required by manufacturer's instructions.

.2 Protection: Take all necessary steps to prevent damage to material during installation as required in manufacturer’s installation instructions.

3.3 Installation

.1 Install the work of this section in strict accordance with the manufacturer's recommendations, using only approved mounting hardware, and locating all components firmly into position, level and plumb.

.2 Where splices occur in horizontal runs, splice aluminum retainer and cover at different locations along the run.

3.4 Protection

.1 Protect installed materials to prevent damage by other trades. Use materials that may be easily removed without leaving residue or permanent stains.

3.5 Cleaning

.1 Proceed in accordance with Section 01 74 11 – Cleaning.

.2 General: Immediately upon completion of installation, clean covers and accessories in accordance with manufacturer’s recommended cleaning method.

.3 Remove surplus materials, rubbish and debris resulting from installation as work progresses and upon completion of work.

End of Section

Part 1 General

1.1 General

.1 Conform to the requirements of Division 1.

1.2 Related Sections

.1 Section 06 61 16 Solid Surfacing
.2 Section 08 80 05 Glazing
.3 Section 09 21 16 Gypsum Board
.4 Section 10 21 13 Compartments and Cubicles
.5 Section 10 51 13 Lockers

1.3 References

.1 ASTM International (ASTM)
.1 ASTM A653/A653M-20 Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process
.2 ASTM A924/A924M-20 Standard Specification for General Requirements for Steel Sheet, Metallic-Coated by the Hot-Dip Process
.3 ASTM B456-17 Standard Specification for Electrodeposited Coatings of Copper Plus Nickel Plus Chromium and Nickel Plus Chromium
.4 ASTM C1036-21 Standard Specification for Flat Glass
.5 ASTM C1503-18 Standard Specification for Silvered Flat Glass Mirror
.6 ASTM D1187/D1187M-97(2018) Standard Specification for Asphalt-Base Emulsions for Use as Protective Coatings for Metal

.2 Canadian General Standards Board (CGSB)
.1 CAN/CGSB-1.81-M90 Air Drying and Baking Alkyd Primer for Vehicles and Equipment.
.2 CAN/CGSB-1.88-92 Gloss Alkyd Enamel, Air Drying and Baking.

.3 CSA Group (CSA)
.1 CSA-B651-12 (R2017) Accessible Design for the Built Environment.
.2 CSA G164-18 Hot Dip Galvanizing of Irregularly Shaped Articles.

1.4 Submittals

.1 Make submittals in accordance with Section 01 33 00 – Submittal Procedures.

.2 Shop Drawings:
.1 Indicate size and description of components, base material, surface finish inside and out, hardware and locks, attachment devices, description of rough-in-frame, building-in details of anchors for grab bars.

.3 Samples:
.1 Submit samples when requested.
.2 Samples to be returned for inclusion into work.

.4 Closeout Submittals:
.1 Provide maintenance data for toilet and bath accessories for incorporation into manual specified in Section 01 78 00 - Closeout Submittals.

1.5 Shipping, Handling and Storage

.1 Refer to Section 01 61 00 – Common Product Requirements.

.2 Deliver, handle and store materials in accordance with manufacturer's printed instructions.

1.6 Waste Management and Disposal

.1 Refer to Section 01 74 19 – Construction Waste Management and Disposal.

1.7 Extra Materials

.1 Provide special tools required for accessing, assembly/disassembly or removal for toilet and bath accessories in accordance with requirements specified in Section 01 78 00 - Closeout Submittals.

.2 Deliver special tools to Owner.

Part 2 Products

2.1 Materials

.1 Sheet steel: to ASTM A653 with ZF001 designation zinc coating.

.2 Stainless steel sheet metal: Type 304, with Brushed finish.

.3 Stainless steel tubing: Type 304, commercial grade, seamless welded, minimum 1.2 mm wall thickness.

.4 Fasteners: concealed screws and bolts hot dip galvanized, exposed fasteners to match face of unit. Expansion shields fibre, lead or rubber as recommended by accessory manufacturer for component and its intended use.

2.2 Manufacturers

.1 Products and components listed are minimum standard of acceptance. Alternative products by recognized manufacturers of toilet and bath accessories may be accepted subject to review by the Consultant of manufacturer's product information and specifications.

.2 Acceptable manufacturers include:
.1 Bobrick
.2 Bradley
.3 Frost
.4 Hafele
.5 Richelieu
.6 Watrous

2.3 Components

1	SD: Soap Dispenser: Liquid wall mounted soap dispenser.	Supplied by Owner, installed by Contractor.
2	Framed Mirror	Bobrick B-293
3	PTD: Paper Towel Dispenser	Supplied by Owner, installed by Contractor.

2.4 Fabrication

.1 Weld and grind joints of fabricated components flush and smooth. Use mechanical fasteners only where approved.

.2 Wherever possible form exposed surfaces from one sheet of stock, free of joints.

.3 Brake form sheet metal work with 1.5 mm radius bends.

.4 Form surfaces flat without distortion. Maintain flat surfaces without scratches or dents.

.5 Back paint components where contact is made with building finishes, to prevent electrolysis.

.6 Hot dip galvanize concealed ferrous metal anchors and fastening devices to CSA G164.

.7 Shop assemble components and package complete with anchors and fittings.

.8 Deliver inserts and rough-in frames to job site at appropriate time for building-in. Provide templates, details and instructions for building in anchors and inserts.

.9 Provide steel anchor plates and components for installation on studding and building framing.

2.5 Finishes

.1 Chrome and nickel plating: to ASTM B456, satin finish.

.2 Baked enamel: condition metal by applying one coat of metal conditioner to ASTM D1187, apply one coat Type 2 primer to CAN/CGSB-1.81 and bake, apply two coats Type 2 enamel to CAN/CGSB-1.88 and bake to hard, durable finish. Sand between final coats. Colour selected from standard range by Consultant.

.3 Manufacturers or brand names on face of units not acceptable.

Part 3 Execution

3.1 Installation

.1 Install toilet and bath accessories in accordance with the Ontario Building Code, CSA B651 and manufacturer’s instructions.

.2 Install and secure accessories rigidly in place as follows:
.1 Stud walls: install steel back-plate to stud prior to plaster or drywall finish. Provide plate with threaded studs or plugs.
.2 Hollow masonry units or existing plaster/drywall: use toggle bolts drilled into cell/wall cavity.
.3 Solid masonry or concrete: use bolt with lead expansion sleeve set into drilled hole.

.3 Install grab bars on built-in anchors provided by manufacturer.

.4 Use tamper proof screws/bolts for fasteners.

.5 Fill units with necessary supplies shortly before final acceptance of building.

.6 Install products in strict compliance with manufacturer’s written instructions and recommendations, including the following:

.1 Verify blocking has been installed properly.
.2 Verify location does not interfere with door swings or use of fixtures.
.3 Comply with manufacturer's recommendations for backing and proper support.
.4 Use fasteners and anchors suitable for substrate and project conditions.
.5 Install units rigid, straight, plumb, and level, in accordance with manufacturer's installation instructions and approved shop drawings.
.6 Conceal evidence of drilling, cutting, and fitting to room finish.
.7 Test for proper operation.

.7 Install electric hand dryers according to manufacturer's instructions. Installation shall be by an electrician and shall be completed in accordance with all relevant standards and Codes.

3.2 Schedule

.1 Locate accessories where indicated. Exact locations determined by Owner.

3.3 Cleaning

.1 Proceed in accordance with Section 01 74 11 – Cleaning.

.2 Clean exposed surfaces of compartments, hardware, and fittings using methods acceptable to the manufacturer.

.3 Touch-up, repair or replace damaged products until Substantial Performance.

End of Section

PART 1 GENERAL

1.1 General

.1 Conform to the requirements of Division 1.

1.2 Related Sections

.1 Section 06 10 00 Rough Carpentry
.2 Section 08 50 00 Aluminum Doors, Windows and Screens

1.3 References

.1 ASTM International (ASTM)
  .1 ASTM D5116-17 Standard Guide for Small-Scale Environmental Chamber Determinations of Organic Emissions from Indoor Materials/Products
  .2 ASTM D6670-18 Standard Practice for Full-Scale Chamber Determination of Volatile Organic Emissions from Indoor Materials/Products
.2 Underwriters Laboratories of Canada (ULC)
  .1 ULC 109-14 Flame Tests of Flame Resistant Fabrics and Films
.3 National Fire Protection Association (NFPA)
  .1 NFPA 701 Standard Methods of Fire Tests for Flame Propagation of Textiles and Films
.4 Canadian Electrical Code.

1.4 Submittals

.1 Make submittals in accordance with Section 01 33 00 – Submittal Procedures.

.2 Submit shop drawings. Clearly indicate, by large scale details, anchorage, assembly, materials, components, finishes, and perimeter construction conditions.

.3 Submit duplicate 300 mm x 300 mm samples of fabrics in selected colours.

.4 Submit manufacturer's maintenance data in the form of printed instructions for cleaning and maintaining roller shades, for inclusion in Operation and Maintenance Manuals specified in section 01 78 00 – Closeout Submittals

1.5 Quality Assurance

.1 Work of this Section shall be by forces in the direct employ or under control of the system manufacturer, skilled, trained and experienced in work of similar scope and complexity.

.2 Manufacturer Qualifications: Company specializing in manufacturing the Products specified in this section, with a minimum of ten years of experience.

.3 Mock-Ups: Erect one full size mock-up of each roller shade type for review. Completed and accepted mock-up shall act as the standard to which the balance of the work will be judged.

1.6 Shipping, Handling and Storage

.1 Refer to Section 01 61 00 – Common Product Requirements.

.2 Test all operable components prior to shipping.

.3 Deliver, handle and store materials in accordance with manufacturer's printed instructions.

1.7 Waste Management and Disposal

.1 Refer to Section 01 74 19 – Construction Waste Management and Disposal.

1.8 Warranty

.1 Warrant the work of this Section against defects of workmanship and material, for a period of two years from the date of Substantial Performance and agree to make good promptly any defects which occur or become apparent within the warranty period.

.2 Manufacturer's Warranty: Submit manufacturer's standard 10 year product warranty executed by an authorized company official.

PART 2 PRODUCTS

Manufacturers

.1 Roller Shade System shall be glazing frame mounted non-electrically Operated Solar Shades as manufactured by Sheerweave Products Limited.

.2 Basis of Design:
.1 The Shearweave 4000 (5%) U62

.3 Subject to compliance with the contract documents, acceptable equivalent products of the following manufacturers may be used upon approval:
.1 Elite Window Fashions
.2 Lighting Harvesting Shading Solutions
.3 Mechoshade Systems Inc.
.4 Nysan Solar Control
.5 Sun Glow Window Covering Products of Canada
.6 SunProject Inc.

2.2 Hardware – Manually Controlled Shades

.1 Chain Operated with infinite positioning. Left or right hand operation and banding as applicable to project conditions.
.1 Drive assembly:
.1 Must allow fingertip control and include a built-in shock absorber system to prevent chain breakage under normal operating conditions.
.2 Factory set for size and travel of shades.
.3 Capable of being field adjusted from the exterior of the shade unit without having to disassemble the hardware.
.4 Drive Chain: No. 10 stainless steel bead chain formed in a continuous loop. The chain shall have passed a 40kg load test. Chain may be positioned at either, or both ends of the shade without disassembly of the shade unit.
.1 Supply and install child safe chain retainers.
.5 Supply and install counter balancing mechanism designed to offset the weight of the shade and give fingertip control.

.2 Control shades and room darkening shades independently.

.1 Audio-Visual (office environment) interface control:
.1 Shade manufacturer shall provide low voltage interface ready MC2 relay system to allow shade operation control from audio-visual equipment not supplied or installed under this

section.

.2 Control shades and room darkening shades independently.

2.3 Assembly

.1 Supply and install fully factory assembled shade units consisting of 2 shade brackets, shade tube, extruded aluminum fascia, hembar and fabric as specified.

.2 Factory modify housings where necessary to bypass columns and other obstructions.

.3 End Brackets: 2 piece molded ABS construction with nylon drive sprocket. Bracket colour coordinated with fascia colour.

.4 Shade tube; Minimum 1.52 mm thick extruded aluminum with 3 equally spaced continuous stiffening fins, non-sag design, maximum deflection under full load of fabric L/700.

.5 Fascia: One piece extruded aluminum 1.7 mm thickness complete with three continuous screw flutes. Anodized. Colour as selected by the Consultant. Extruded aluminum snap lock fascia which continuously fits on the end and center brackets as a one-piece section.

.6 Hembar: extruded aluminum with matching plastic end finials.

.7 Blackout Shade Features: 13 mm pile mounted in prefinished 38 x 28 mm extruded aluminum side and bottom channels finished to match window framing. Include dynamic hembar to allow for variances in windowsill level.

2.4 Shade Mounting System

.1 Extruded aluminum bracket designed to accept preassembled shade system.
  .1 Brackets shall be used to facilitate the alignment with shade opening.

.2 Modular Construction: shades must be removable as a complete modular unit without any component disassembly required.

2.5 Aluminum Finish

.1 Exposed aluminum: Baked enamel, Dark Grey

.2 Unexposed aluminum: mill finish.

2.6 Shade Fabric

.1 Sun control fabric: dimensionally stable shade fabric.
  .1 Acceptable Products: 5% open area:
    .1 sheerweave, Style 4000.
    .2 ECO / Granite.

.2 Blackout shade fabric: dimensionally stable blackout fabric.
  .1 To be selected from manufacturer’s full range.

.3 Performance: fabric shall hang flat, without buckling or distortion. Edge, where trimmed, shall hang true and straight, without shifting sideways more than 3 mm in either direction due to warp distortion or weave design.

.4 Fabric shall be certified by an independent laboratory to pass the small scale vertical burn requirements test ULC S109 and NFPA 701.

2.7 Fabrication

.1 Finished assemblies shall be square, true to size and free from distortion, twist or other defects that could affect their strength, operation or appearance.
.2 Factory applied finish shall be uniform, smooth and without blemishes.

.3 The fabric shall be colour fast, retain its shape, not be affected by moisture or heat, and shall be non-flammable. Cut fabric to eliminate glare and reflection from shining surfaces while maintaining exterior view. The top of the fabric shall be retained in the recessed spline of the shade roller and the bottom of the fabric shall be retained by the hem bar.

PART 3 EXECUTION

3.1 Installation

.1 Install shading devices in accordance with manufacturer's instructions.

.2 Take field measurements prior to fabrication to ensure fit.

.3 Fabric shall be premeasured and manufactured off-site.

.4 Install square, plumb, true to line, adequately anchored, maintaining uniform clearances, accurate alignment levels and parallel with the window plane. Fabric shall not travel more than 3 mm in either direction within channels after installation.

.5 Adjust operable parts for correct function.

.6 Secure with non-corrosive fasteners, concealed in final assembly.

.7 Fabric shall hang flat, without buckling or distortion. The edge, when trimmed, shall hang straight without raveling. An unguided roller shade cloth shall roll true and straight, without shifting sideways more than + 3 mm in either direction due to warp distortion, or weave design.

.8 Black out shades shall be installed to eliminate passage of light from exterior.

.9 Electrical wiring, hook-up, switches, motorized shades: in accordance with Division 26 requirements.

.10 Adjust to provide for operation without binding.

.11 Refinish damaged or defective work so that no variation in surface appearance is discernable.

3.2 Demonstration

.1 Prior to acceptance of system, arrange for demonstration of equipment with authorized representatives of the Owner, to be performed by representative of shade manufacturer to assure proper function, operation and explanation.

.2 Conduct comprehensive demonstration for Owner's staff on operation and care of interior window treatments.

3.3 Cleaning

.1 Proceed in accordance with Section 01 74 11 – Cleaning.

End of Section