O'NEILL CVI WASHROOM & INTERIOR RENOVATIONS

301 Simcoe Street North, Oshawa ON. L1G 4T2

Issued For Tender

Project 25267

DATE: April, 2026

BARRY BRYAN ASSOCIATES
(905) 666-5252
bba@bba-archeng.com
www.bba-archeng.com
250 Water Street, Suite 201
Whitby, ON L1N 0G5

End of Section

Dwg. No.	Title	Issue No.	Rev. No.	Issue Date
ARCHITECTURAL				
A000	OBC Matrix, Location Plan & Drawing List	4	-	April 24, 2026
A201	Demolition Plans & Demolition Reflective Ceiling Plan	4	-	April 24, 2026
A202	Floor Plans & Reflective Ceiling Plans	4	-	April 24, 2026
A701	Interior Elevations & Sections	4	-	April 24, 2026
A801	Sections, Details & Millwork	4	-	April 24, 2026
A901	Door & Interior Finishes Schedules	4	-	April 24, 2026
MECHANICAL				
M-100	Mechanical Legend, Specifications, Schedules & Drawing List	3	-	April 24, 2026
M-101	Specifications, Plumbing Fixture & Details	3	-	April 24, 2026
M-200	Ground Floor – PD (Demo/New)	3	-	April 24, 2026
M-201	Ground Floor – HVAC (Demo/New)	3	-	April 24, 2026
ELECTRICAL				
E-100	Electrical Legend, Specifications and Details	3	-	April 24, 2026
E-200	First Floor Washrooms & Custodian Demo and New Work	3	-	April 24, 2026
E-300	First Floor Washrooms & Custodian Demo and New Work Power	3	-	April 24, 2026
E-300	Electrical Details	3	-	April 24, 2026

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 Site security
.12 Protection of Drawings
.13 "By Others"

1.2 Work Covered by Contract Documents

.1 Work of this Contract comprises the **Washroom Renovation, O'Neill CVI 301 Simcoe St N, Oshawa Ontario,** for the **Durham District School Board,** and as indicated on the drawings and specifications.

1.3 Partial Owner Occupancy

.1 Owner, or other contractors or suppliers retained by the Owner, will occupy areas of the building and site during the course of the work.

.2 The existing **O'Neill CVI** beyond the work area limits, will remain in use by the Owner throughout the construction period.

.3 The Contractor will be the "Constructor" as defined by the Occupational Health and Safety Act on this project and will be solely responsible for all persons on the Site including Owner and contractors or suppliers retained by the Owner.

.4 Work in occupied areas beyond the limits of hoarding shall be completed during non-school hours as approved and agreed with the Owner.

1.4 Owner Furnished Items

.1 The following items will be supplied by the Owner for installation by the Contractor:
1. Any items specifically mentioned in the Contract Documents.

1.5 Site Access

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

1.6 Work Sequence

.1 Construct Work continuously.

1.7 Site Reference and Documentation

.1 Obtain from the Owner and be familiar with all available reference material and historic documentation for the building site.

.2 Maintain a copy of all reference materials and documents on site for the duration of the Work.

.3 No claims for extras or for delay will be considered due to the Contractor's failure to fully apprise himself of the condition of the site prior to commencement of the work.

1.8 References and Codes

.1 Perform Work in accordance with Ontario Building Code (OBC), National Fire Code of Canada (NFC), the Canadian Electrical Code CAN C22.1, 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.

1.9 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.

1.10 Hazardous Material Discovery

.1 Should hazardous materials be encountered which are not identified in the referenced reports, stop work and contact the Owner and Consultant immediately.

1.11 Building Smoking Environment

.1 Smoking is prohibited in all workplaces within the Owner's buildings and on School Board property.

1.12 Site Security

.1 Daily Inspection: Provide inspection of the building and site daily while the work is in progress and take whatever measures are necessary to secure the building and site from theft, vandalism and unauthorized entry.

1.13 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.

1.14 "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.

PART 2 PRODUCTS

2.2 Materials

.1 Not used

PART 3 EXECUTION

3.1 Not Used

.1 Not used

End of Section

SAMPLE

[Date]

[CONTRACTOR'S COMPANY

ADDRESS

CITY, PROVINCE, POSTAL CODE]

Attention: [INSERT CONTACT NAME]

At your request, BBA will provide electronic files for your convenience and use in the preparation of your shop drawings for Project Name, subject to the following terms and conditions:

Our electronic files are compatible with [AutoCAD 2022 (**)]. We make no representation as to the compatibility of these files with your hardware or your software beyond the specified release of the referenced drawings.

Data contained on these electronic files are part of our instruments of service, and at all times remain the exclusive property of Barry Bryan Associates and copyright is reserved. The electronic files shall not be used by you for any purpose other than as a convenience in the preparation of shop drawings for the referenced project. You further agree not to transfer these electronic files to others without the prior written consent of Barry Bryan Associates. Any other use or reuse by you or by others will be at your sole risk and without liability or legal exposure to us. You agree to make no claim and hereby waive, to the fullest extent permitted by law, any claim or cause of action of any nature against us, our officers, directors, employees, agents or other project consultants that may arise out of or in connection with your use of the electronic files.

Furthermore, you shall, to the fullest extent permitted by law, indemnify and hold us harmless against all damages, liabilities or costs, including reasonable attorneys' fees and defence costs, arising out of or resulting from your use of these electronic files, or from the use by others, should they have obtained them from you.

These electronic files are not construction documents. Differences may exist between these electronic files and corresponding hard-copy construction documents. We make no representation regarding the accuracy or completeness of the electronic files you receive. In the event that a conflict arises between the hard-copy construction documents prepared by us and the electronic files, the hard-copy construction documents shall govern. You are responsible for determining if any conflict exists.

Due to the nature of the design and construction process, the drawings on these electronic files may not be fully coordinated, may change, and may not incorporate revisions, change orders, or addenda. By your use of these electronic files, you are not relieved of your duty to fully comply with the contract documents, including, and without limitation, the need to check, confirm and coordinate all dimensions and details, take field measurements, verify field conditions and coordinate your work with that of other contractors for the project.

Because information presented on the electronic files can be modified, unintentionally or otherwise, we require all indications of our ownership and/or involvement be removed from each electronic display.

We will furnish you electronic files upon your written request.

Under no circumstances shall delivery of the electronic files for use by you be deemed a sale by us, and we make no warranties, either express or implied, of merchantability of fitness for any particular purpose. In no event shall we be liable for any loss of profit or any consequential damages as a result of your use or reuse of these electronic files.

_____	_____
Barry Bryan Associates	[CONTRACTOR FIRM NAME]

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
Attention: Ms. Cassandra Cautius, OAA

.2 STRUCTURAL ENGINEER:
Barry Bryan Associates
201 - 250 Water Street
Whitby, Ontario L1N 0G5
Tel: (905) 666-5252
Fax: (905) 666-5256
Attention: Mr. Doug McLaughlin, P. Eng.

.3 MECHANICAL ENGINEER:
RoMar Engineering
20 Denbury Court,
Whitby, Ontario L1M 0H5
Tel: (647)-406-8602
Attention: Ms. Margaret Edwards, P.Eng.

.4 ELECTRICAL ENGINEER:
MJA Engineering Ltd.
556 Edward Avenue, Unit 82
Richmond Hill, Ontario L4C 9Y5
Tel: (416) 598-2920
Attention: Mr. Ryan Lien, P.Eng.

PART 2 PRODUCTS

3.1 Not Used

.1 Not used

PART 3 EXECUTION

3.2 Not Used

.1 Not used

End of Section

PART 1 GENERAL

1.1 Section Includes

.1 Access and Egress
.2 Use of Site and Facilities
.3 Alterations, Additions or Repairs to Existing Buildings
.4 Existing Services
.5 Special Requirements
.6 Security
.7 Building Smoking Environment

1.2 Access and Egress

.1 Design, construct and maintain temporary "access to" and "egress from" work areas, including stairs, runways, ramps or ladders and scaffolding, independent of finished surfaces and in accordance with relevant municipal, provincial and other regulations.

1.3 Use of Site and Facilities

.1 Execute work with least possible interference or disturbance to normal use of premises. Make arrangements with Owner to facilitate work as stated.

.2 Maintain existing services to building and provide for personnel and vehicle access.

.3 Where security is reduced by work provide temporary means to maintain security.

.4 Owner will assign sanitary facilities for use by Contractor's personnel. Keep facilities clean.

.5 Protect walls of passenger elevators, to approval of Owner prior to use.

.6 Accept liability for damage, safety of equipment and overloading of existing equipment.

.7 Closures: protect work temporarily until permanent enclosures are completed.

1.4 Alterations, Additions or Repairs to Existing Buildings

.1 Execute work with least possible interference or disturbance to[building operations, occupants, public and normal use of premises. Arrange with Owner to facilitate execution of work.

1.5 Existing Services

.1 Notify, Owner, utility companies of intended interruption of services and obtain required permission.

.2 Where Work involves breaking into or connecting to existing services, give Owner 48 hours of notice for necessary interruption of mechanical or electrical service throughout course of work. Keep duration of interruptions minimum. Carry out interruptions after normal working hours of occupants, preferably on weekends.

.3 Provide for personnel, pedestrian and vehicular traffic.

.4 Construct barriers in accordance with Section 01 56 00.

1.6 Special Requirements

.1 Coordinate noise generating work Monday to Friday with custodial staff on site.

.2 Submit schedule in GANTT format.

.3 Ensure Contractor's personnel employed on site become familiar with and obey regulations including safety, fire, traffic and security regulations.

.4 Keep within limits of work and avenues of ingress and egress.

.5 Deliver materials outside of peak traffic hours [17:00] to [07:00] and [13:00] to [15:00] unless otherwise approved by Owner.

.6 Prior to cutting or drilling horizontal or vertical surfaces including concrete, concrete block or other structural substrate, determine location of reinforcing, service lines, pipes, conduits or other items by x-ray, ground penetrating radar or other appropriate method. Submit findings to Owner prior to cutting or drilling.

1.7 Security

.1 Where security has been reduced by Work of Contract, provide temporary means to maintain security.

.2 Security clearances:
- .1 Personnel employed on this project will be subject to security check. Obtain clearance, as instructed, for each individual who will require to enter premises.
- .2 Personnel will be checked daily at start of work shift and provided with pass which must be worn at all times. Each pass must be returned at end of work shift and personnel checked out.

1.8 Building Smoking Environment

.1 Comply with smoking restrictions. Smoking and vaping is not permitted.

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 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 Site Instruction, 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 Amount of each allowance, for Work specified in respective specification Sections is as follows:

.1	Inspection and Testing	$10,000.00
.2	Miscellaneous	$20,000.00
.3	Abatement	$10,000.00

.4 Unforeseen Cutting and Patching $15,000.00

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 Substitution (RFS) prior to execution of Contract.
.2 Requests for Substitution (RFS) after execution of Contract.

1.2 Definitions

.1 Products Not Available: When all listed manufacturers products in the specification section are no longer manufactured.

.2 Proprietary Specification: a specification which includes one or more proprietary names of products or manufacturers, or both, and may also include descriptive, reference standard, or performance requirements, or any combination thereof.

.3 Non-proprietary Specification: a specification which includes descriptive, reference standard or performance requirements, or any combination thereof, but does not include proprietary names of products or manufacturers.

.4 Substitution: a product or manufacturer not specified by proprietary name, which may be acceptable in place of a product or manufacturer which, is specified by proprietary name.

1.3 Procedures

.1 Product Options:
  .1 For products specified by non-proprietary specification:
    .1 Select any product by any manufacturer, which meets requirements of Contract Documents.
  .2 For products specified by proprietary specification:
    .1 Select any product or manufacturer named, or
    .2 Substitute an unnamed product or manufacturer in accordance with Substitutions – Manufacturers article of this Section.
  .3 For products specified by proprietary specification and accompanied by words indicating that substitutions will not be accepted:
    .1 Select any product or manufacturer named; substitutions are not permitted.

.2 Substitution Requests Prior to Execution of Contract: Submit substitutions requests to Consultant no later than the time stated in the Instructions to Bidders.

1.4 Substitutions – Products

.1 Substitute Products: Where substitute products are permitted, unnamed products may be accepted by the Consultant, subject to the following:
  .1 Substitute products shall be the same type as, be capable of performing the same functions as, and meet or exceed the standards of quality and performance of the specified products.
  .2 Substitutions for Cause: Changes proposed by Subcontractor that are required due to changed Project conditions, such as unavailability of product, regulatory changes, or unavailability of required warranty terms.
  .3 Substitutions for Convenience: Changes proposed by Subcontractor or Contractor that are not required in order to meet other Project requirements but may offer advantage to Contractor or Subcontractor.

1.5 Substitutions – Manufacturers

.1 Substitute Manufacturers: Where substitute manufacturers are permitted, unnamed manufacturers will be accepted by the Consultant, subject to the following:
  .1 Substitute manufacturers shall have capabilities comparable to those of the named manufacturers.
  .2 In making a substitution Contractor and the Subcontractor represents that they have:
    .1 Investigated substitute product or manufacturer, or both, and determined it meets or exceeds the criteria of the specified product, and;
    .2 Will provide the same warranty for the Substitution as for the specified product.
    .3 Will make any changes to the Work necessitated by substitution as required for Work to be complete in all respects, and;
    .4 Waives claims for additional costs and time caused by substitution which may subsequently become apparent.
    .5 Will reimburse Consultant's services for review or redesign, additional studies, investigations, review of submittals, and associated contract administration.
    .6 Received necessary approvals of authorities having jurisdiction.
    .7 Investigated the proposed substitute to determine if license fees and royalties are pending.
    .8 If accepted, the substitution will not adversely affect the Construction Schedule.
  .3 Do not install requested Substitutions without Consultant's acceptance.
  .4 If, in the Consultant's opinion, a substitution does not meet requirements of Contract Documents, Contractor shall, at no extra cost to Owner, provide a product which, in the Consultant's opinion, does meet requirements of Contract Documents.

1.6 Proprietary Specifications

.1 Notwithstanding specified proprietary names of either or both products or manufacturers, products provided shall meet other applicable requirements of Contract Documents. Modify products if necessary, to ensure compliance with all requirements of Contract Documents.

1.7 Changes to Accepted Products and Manufacturers

.1 Products and manufacturers accepted by the Consultant for use in performance of Work of Contract shall not be changed without Consultant's written consent. .

.2 Submit requests to change accepted products and manufacturers to Consultant in writing, including product data indicated in Product Data article.

1.8 Product Data

.1 When requested by the Consultant, submit complete data substantiating compliance of a product with requirements of Contract Documents. Include the following:
  .1 Product identification, including manufacturer's name and address.
  .2 Manufacturer's literature providing product descriptions, applicable reference standards, performance and test data, in form consistent with the Contract Documents and readily comparable with product being substituted and can provide the specified and indicated requirements.
  .3 Samples, as applicable.
  .4 Name and address of projects on which product has been used and date of each installation.
  .5 Itemized comparison of substitution with named product(s). List significant variations.
  .6 Designation of availability of maintenance services and sources of replacement materials
  .7 Completed Substitutions Request Form. Incomplete forms will be rejected.

1.9 Consultant Procedure

.1 In reviewing the supporting data submitted for substitutions, Consultant will use, for purposes of comparison, all the characteristics of the specified material or equipment as they appear in the manufacturer's published data even though all the characteristics may not have been particularly mentioned in the Specifications.

.2 Consultant will review supporting data and will determine that the substitution in the Consultant's opinion is or is not able to meet or exceed the standards of quality, appearance and performance to the material specified.

.3 Consultant will sign, date and issue the RFS indicating acceptance or refusal, with applicable pre-contract or contract documentation, to affected participants.

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 Related Sections

.1 Section 01 31 00 Project Management and Coordination
.2 Section 01 33 00 Submittal Procedures

1.3 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.
  .1 An RFI shall not constitute notice of claim for a delay.

1.4 Submittal Procedures

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

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

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

.4 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.

.5 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.

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

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

1.5 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.

1.6 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.

1.7 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 and the originator of the RFI within 3 Working Days of receipt of such RFI's, and the Consultant, the Contractor, and the originator 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 and originator 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 General

.1 Conform to the requirements of Division 1.

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 Personnel and vehicle permit procedures
- .4 Use of premises
- .5 Location of any Contractor on-Site facilities
- .6 Security
- .7 Housekeeping
- .8 Submittal and RFI procedures
- .9 Inspection and testing procedures, on-Site and off-Site
- .10 Control and reference point survey procedures
- .11 Injury and Illness Prevention Program
- .12 Contractor's Schedule of Values if applicable.
- .13 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.

.2 Project meetings shall be held bi-weekly.

.3 Meeting minutes shall be distributed to all parties within three days of the meeting.

.4 Attendees at project meetings shall include as a minimum; Owner, Consultant, Contractors Project manager and Site Superintendent and major subcontractors.

1.4 Safety Meetings

.1 Conduct monthly contractor safety committee meetings.

.2 Conduct weekly toolbox talks.

1.5 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 Designated substances reports.
.13 Other documents as specified.

1.6 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.

1.7 Requests for Information (RFI's)

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

1.8 Closeout Procedure

.1 Notify Consultant when Work is considered ready for Substantial Performance.

.2 Accompany Consultant on preliminary inspection to determine items listed for completion or correction.

.3 Comply with Consultant's instructions for correction of items of Work listed in executed certificate of Substantial Performance.

.4 Notify Consultant of instructions for completion of items of Work determined in Consultant's final inspection.

1.9 Cost Breakdown

.1 Submit a detailed cost breakdown to Consultant at least ten (10) working days prior to the submission of the first progress claim. After approval by Consultant the cost breakdown will be used as basis for progress payment.

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 Related Sections

.1 Section 01 33 00 Submittal Procedures
.2 Section 01 77 00 Closeout Procedures

1.3 Submittals

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

1.4 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.

1.5 Format

.1 Prepare schedule in form of a horizontal bar chart using MS Project spreadsheets.

.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.

.7 Maintain schedule up to date.

1.6 Submission

.1 Submit schedules in electronic format, forward on disc as PDF files.

.2 Submit one opaque reproduction, plus 2 copies to be retained by Consultant.

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

.4 Following Consultants review, and prior to commencement of the Work, the schedule shall be reviewed jointly, by the Owner, Consultant and Contractor and approved by all parties.

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

.6 No changes are to be made to the agreed upon construction schedule without prior approval by all parties (owner, architect & contractor) through a signed change order.

.7 Submit revised progress schedule at each regularly scheduled project meeting and with each application for payment.

.8 Indicate any changes in completion dates in relation to the original Contract dates.

.9 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.

1.7 Critical Path Scheduling

.1 Include complete sequence of construction activities.

.2 Include dates for commencement and completion of each element of construction.

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

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

.5 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.

.6 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.

1.8 Submittals Schedule

.1 Include schedule for submitting shop drawings, product data, and samples.

.2 Indicate dates for submitting, review time, resubmission time, 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 General

.1 Conform to the requirements of Division 1.

1.2 Section Includes

.1 Shop drawings and product data.

.2 Samples.

.3 Certificates and transcripts.

1.3 Related Sections

.1 Section 01 26 15 Requests for Information
.2 Section 01 31 00 Project Management and Coordination

1.4 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 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.

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

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

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

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

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

1.5 Requests for Information (RFI's)

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

1.6 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.

1.7 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 The Contractor is responsible to have reviewed the drawings prior to submission of his bid and confirms that all equipment can be installed as proposed in the drawings. No additional costs will be accepted for failure to complete this review.

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

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

1.8 Progress Photographs

.1 Progress photograph to be electronically formatted and labelled as to location and view.

1.9 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.

1.10 Mock-Ups

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

1.11 Certificates and Transcripts

.1 Submit Workers' Compensation Board status.

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 Related Sections

.1 Section 01 41 00 Regulatory Requirements
.2 Section 01 51 00 Temporary Utilities
.3 Section 01 56 00 Temporary Barriers and Enclosures

1.3 References

.1 Statutes of Canada 1999 Chapter 33. Canadian Environmental Protection Act 1999.
  .1 SOR/2003-289. Federal Halocarbon Regulations, 2003.
  .2 Transportation of Dangerous Goods Act, 1992 (1992, c. 34)

1.4 Administrative

.1 Comply with all federal, provincial, and municipal regulatory requirements and guidelines for environmental protection and natural resource conservation, including those referenced above.

.2 The Work Site is subject to inspection by the Consultant, without prior notice.

.3 Failure to comply with environmental requirements may result in a stop work order or assessment of damages commensurate with repair of damage.

.4 It is the Contractor's responsibility to be aware of environmental requirements and the best management practices and pollution control measures necessary to meet them.

.5 It is the Contractor's responsibility to obtain and abide by permits, licenses and compliance certificates at appropriate times and frequencies as required by the authorities having jurisdiction.

.6 All hazardous materials are to be stored with secondary containment

1.5 Fires

.1 Fires and burning of rubbish on site not permitted.

1.6 Disposal of Wastes

.1 Plan for the re-use, recycling, or disposal of all waste materials as per applicable legislation.

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

.3 Do not dispose of any deleterious substances into waterways, storm or sanitary sewers.

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 Owner's Regulations.
.3 Standards and Definitions.
.4 Designated Substances.
.5 Hazardous Materials.
.6 Potable Water Systems.
.7 Access for Inspection and Testing.
.8 Other Regulatory Requirements.

1.2 Related Sections

.1 Section 01 70 03 Safety Requirements

1.3 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.

1.4 Owner's Regulations

.1 Conform to requirements, regulations and procedures of the Owner.

1.5 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.

.3 Where a standard designates authorities such as the "Engineer", the "Owner" (when used in a sense other than that defined in the General Conditions) the "Purchaser" or some other such designation, these designations shall be taken to mean the Consultant.

.4 Wherever the words "acceptable", "approved", "satisfactory", "selected", "directed", "inspected", "instructed", "required", "submit", or similar words or phrases are used in standards or elsewhere in the Contract Documents, it shall be understood that they mean, unless the context provides otherwise, "acceptable to the Consultant", "approved by the Consultant", "satisfactory to the Consultant", "selected by the Consultant", "directed by the Consultant", "inspected by the Consultant", "instructed by the Consultant", "required by the Consultant" and "submit to the Consultant".

1.6 Designated Substances

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

.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 and removal of such substances encountered on the site during the course of the work which are not identified in the Designated Substance Report.

1.7 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.

1.8 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

1.9 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.

1.10 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 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 General

.1 Conform to the requirements of Division 1.

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 allowances specified in Section 01 21 13. Refer to Section 01 29 83.

.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.

.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.

1.9 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.

1.10 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 Appointment and payment.
.2 Manufacturer's field review.

1.2 Related Sections

.1 Particular requirements for testing and inspection to be carried out by testing laboratory designated by the Consultant are specified under various sections of the specifications.

.2 Balancing and testing of systems under Divisions 21 through 28.

1.3 Appointment and Payment

.1 From time to time during the progress of the Work, the Owner will require that testing and inspection be performed to determine that materials provided in the Work meet the requirements of the Contract Documents.
  .1 Subcontractors shall verify with Contractor, in writing, portions of the Work that will require testing and/or inspection prior to commencing such affected work.

.2 The Owner will appoint testing and inspection companies, representing, reporting and responsible to the Owner. Cost of testing and inspection will be authorized as a disbursement of the Cash Allowances as specified in Section 01 21 13 unless otherwise indicated or specified and except for the following:
  .1 Testing and inspection required by laws, ordinances, rules, regulations or orders of public authorities.
  .2 Testing and inspection performed exclusively for Contractor's convenience.
  .3 Testing, adjusting and balancing of conveying systems, mechanical and electrical equipment and systems. Refer to mechanical specifications for in-contract air-balancing.
  .4 Mill tests and certificates of compliance.
  .5 Tests specified to be carried out by Contractor under supervision of the Consultant.
  .6 Where tests or inspections by designated testing laboratory reveal work not in accordance with the Contract requirements, Contractor shall pay costs for additional tests or inspections as Consultant may require to verify acceptability of corrected work.
  .7 Additional testing required because of changes in materials, proportions of mixes, requested by the Contractor or Subcontractors as well as any extra testing of materials occasioned by lack of identification or failure of such materials being replaced to meet requirements of the Contract Documents or testing of structure or elements including load testing, shall be ac carried out at no additional cost to the Owner.
  .8 Where evidence exists that defective workmanship has occurred or that the Work has been carried out incorporating defective materials, the Consultant reserves the right to have tests, inspections or surveys performed, analytical calculation of structural strength made and the like in order to help determine the extent of defect and whether such work must be replaced. Tests, inspections or surveys carried out under these s circumstances will be made at the Contractor's expense and will not be paid for by the Owner.
  .9 Testing and compliance letters specified in other Sections.

.3 Inspection and testing company shall submit monthly invoice original to the Contractor for review, relating invoices to tests and inspection reports. Provide original receipts for disbursements. Invoices will be forwarded by Contractor to the Consultant for inclusion in progress payment application.

.4 The Consultant will work with the Owner's representative and the Contactor's commissioning team to review the work of the Contract during closeout procedures. The Contractor shall be responsible to correct all deficiencies as reported by the Consultant and Owner's representative, and in accordance with the Contract documents. Refer to Sections 01 77 00 for additional closeout requirements.

.5 Testing and Inspection shall be performed by qualified and/or certified personnel under professional supervision or performed directly by a professional engineer qualified in conformance with applicable codes and certification programs.

.6 Requirements of regulatory agencies:
- .1 Testing shall be conducted in accordance with the requirements of the Building Code.
- .2 Obtain certification where required by the building code and standards.

.7 Cooperation with testing and inspection company.
- .1 Provide inspection company with materials and installation information as required or as requested.
- .2 Provide access to the work for representatives of the inspection and testing companies.
- .3 Provide storage on site for laboratory's exclusive use to store equipment and cure test samples.
- .4 Cooperate with testing and inspection companies and give adequate notification of any changes in source of supply, additional work shifts or other proposed changes.
- .5 No Product nor part of the Work shall be installed before it is tested when a test is specified or required, nor shall work be executed where a test or inspection is required and the inspector cannot attend. Pay costs for uncovering and making good work that is covered before required inspection or testing is completed and approved by the Consultant.
- .6 Cooperate in permitting access to the Work for testing and inspection company wherever Work is in progress, or wherever Products, materials or equipment are stored prior to shipping.
- .7 Supply labour required to assist testing and inspection company in sampling and making tests.
- .8 Repair work damaged as a result of testing and inspection work.
- .9 Costs of above labour and material shall be borne by applicable Subcontractors.
- .10 The testing and inspection service does not relieve the Contractor of responsibility for normal shop and site inspection, and quality control of production.
- .11 Pay costs for removal and replacement of Work, or for remedial measures necessitated by faulty workmanship and materials which fail to meet requirement specified.

.8 Prepare schedule for testing and inspection in accordance with Section 01 33 00 and as follows:
- .1 Establishing Schedule:
  - .1 By advance discussion with the selected testing laboratory, determine the time required by the laboratory to perform its tests and issue each of its findings.
  - .2 Allow required time within Construction Schedule
- .2 Adherence to Schedule:
  - .1 Contractor shall advise testing and inspection laboratory in advance when testing of the Work is required.
  - .2 When testing and inspection laboratory is ready to test according to predetermined schedule, but is prevented from testing or taking specimens due to incompleteness of the parts of the Work scheduled for testing and inspection, extra costs for testing attributable to the delay may be back-charged to the Contractor at no increase in the Contract Price.
- .3 Notify Contractor and inspection company at least 3 Working Days before work required to be inspected commences, and arrange for a meeting at the Place of the Work, to be held one Working day before the work starts with the following present:
  - .1 Contractor, a principal of the Sub-contractor whose work is to be inspected or tested,

testing and inspection company, manufacturer's res presentative and Consultant.

.4 Give 2 Working Days prior notice to inspection company of the commencement of each phase of the Work requiring inspection and provide inspection company with materials and installation information.

.9 Reports and Documents:

.1 Testing and Inspection companies shall submit shop inspection and site inspection reports within 5 Working days of each inspection.

.2 Distribute reports as follows:

.1 Owner.

.2 Consultant.

.3 Contractor.

.4 Consulting engineers as applicable.

.3 Inspectors shall submit a written report on each inspection or test, including pertinent data such as conditions at the Place of the Work, dates, test references, locations of tested materials, actual product identification, procedures and descriptions, site instructions given, recommendations and/or any other information required by standard applicable reporting of tests and inspections.

.4 Clearly indicate in report failure of Product or procedures to meet applicable standards, give recommendations for retesting or correction. Contact Consultant immediately when Product or procedure fails to meet applicable standards.

.5 Upon completion of those parts of the Work subject to independent testing and inspection, submit to the Consultant duplicate certificates of acceptance of the installation issued by independent testing and inspection company.

.10 Inspection and Test Specimens:

.1 Testing and inspection will generally consist of procedures listed in the following paragraphs, but additional tests may be performed as required to verify conformance to Contract Documents.

.2 Specimens and samples for testing, unless otherwise specified in the Contract Documents, will be taken by the testing laboratory; sampling equipment and personnel will be provided by the testing laboratory; and deliveries of specimens and samples to the testing laboratory will be performed by the testing laboratory.

.3 Testing and inspection company shall take samples necessary to verify quality as specified by applicable standards or as specified herein. Taking of samples shall not endanger the structure or life and shall be taken so as to best represent the Work as a whole.

.4 Samples shall be handled, packaged, stored and delivers so as to best ensure the validity of tests that will be performed on them. Sample handling where required shall duplicate conditions at the Place of the Work (such as site cured concrete cylinders).

1.4 Manufacturer's Field Review

.1 Where manufacturer's field review is specified, manufacturer's representative shall review the relevant parts of work at the Place of Work, or wherever such affected work is in progress, to end sure that work is being executed in accordance with manufacturer's written recommendations.

.2 Manufacturer's field review is to ensure that the Products specified are being used in the Work and are being applied on surfaces prepared in accordance with their recommendations and the requirements of the Contract Documents.

.3 Manufacturer's representative shall undertake such review weekly, or additionally as necessary, to determine that the work is in accordance with manufacturer's written recommendations.

.4 Manufacturer's representative shall submit a type written report on manufacturer's letterhead

within 2 Working Days after each field review. Report shall document manufacturer's representative's field observations and recommendations.

.5 Manufacturer's field review reports to be prepared and distributed following the procedures specified for pe reparation and submittal of testing and inspection reports given 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 General

.1 Conform to the requirements of Division 1.

1.2 Section Includes

.1 Temporary utilities.

1.3 Related Sections

.1 Section 01 52 00 Construction Facilities.
.2 Section 01 56 00 Temporary Barriers and Enclosures

1.4 Installation and Removal

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

.2 Remove from site all such work after use.

1.5 Water Supply

.1 Provide continuous supply of water for construction use.

.2 Arrange for connection with local utility company and pay all costs for installation, maintenance and removal.

.3 Pay all utility charges.

.4 Conveniently locate water supply for use by all sections of the work. Protect water lines from freezing.

.5 Water shall be potable and shall meet the requirements of the technical sections of the specifications.

1.6 Temporary Heating and Ventilation

.1 Provide temporary heating required during construction period, including attendance, maintenance and fuel.

.2 Construction heaters used inside building must be vented to outside or be flameless type. Solid fuel salamanders are not permitted, unless prior approval is given by the Consultant.

.3 Provide temporary heat 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.

.4 Maintain temperatures of minimum 10° C in areas where construction is in progress.

.5 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.

.6 Permanent heating system of building, may be used when available.

.7 On completion of Work for which permanent heating system is used, replace filters.

.8 Ensure Date of Substantial Performance and Warranties for heating system do not commence until entire system is in as near original condition as possible and is certified by Consultant.

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

.10 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.

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

1.7 Temporary Power and Light

.1 Provide and pay for all temporary power during construction.

.2 Arrange for connection with utility company. Pay all costs for installation, maintenance and removal.

.3 Provide and maintain temporary lighting throughout project. Lighting levels shall be sufficient to complete work including inspections. Provide minimum lighting levels of 400 lux at work areas. Lighting levels at floors and stairs not within work areas shall be not less than 160 lux at all times during construction activity.

.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.

1.8 Temporary Communication Facilities

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

1.9 Fire Protection

.1 Provide and maintain temporary fire protection equipment during performance of Work required by insurance companies having jurisdiction and governing codes, regulations and bylaws.

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 Offices and sheds.
.3 Parking.
.4 Project identification.

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 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.

1.5 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.

1.6 Offices

.1 General Contractor may provide their own offices as necessary and subject to site constraints. Direct location of these offices.

1.7 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.

1.8 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.

1.9 Construction Signage

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

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

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

1.10 Shoring

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

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

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

.4 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.

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

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

.7 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.

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

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

.10 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 Hoarding

.1 Erect temporary enclosures where required using new solid plywood hoarding, minimum 1.8 metres high. Provide gates as necessary. Maintain hoarding in good repair.

1.4 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.

1.5 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.

1.6 Access to Site

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

.2 Maintain access for staff, students and visitors to the existing school and designated school areas.

1.7 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.

1.8 Fire Routes

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

1.9 Protection for Off Site and Public Property

.1 Protect surrounding private and public property from damage during performance of Work.

.2 Be responsible for damage incurred

1.10 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 (referred to as products throughout specifications) 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 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 Use non corrosive hot dip galvanized steel fasteners and anchors for securing exterior work, unless stainless steel or other material is specifically requested in affected specification Section.

.4 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.

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

.6 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. Use No. 304 stainless steel for exterior areas.

.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.

1.16 Hazardous Materials

.1 Report any found or suspected hazardous materials 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 Safety Requirements
.2 Fire Protection
.3 Accident Reporting
.4 Records on Site

1.2 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 Site-specific Health and Safety Plan prior to commencement of work on the work site.
  .2 Fire Safety Plan.
  .3 Reports or directions issued by authorities having jurisdiction, immediately upon issuance from that authority.
  .4 Accident or Incident Reports, within 24 hours of occurrence.

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

1.3 Compliance Requirements

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

1.4 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 Environmental Protection Act.
  .8 The Power Commission Act.
  .9 The Boiler and Pressure Vessels Act.
  .10 The Elevators and Lifts Act.
  .11 The Operating Engineer's Act.
  .12 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 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.

.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 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 or injury to any person on the site, adjacent work areas and adjacent property.

.10 Provide safeguard and protection against damage to adjacent structures, properties and services.

1.5 Fire Protection

.1 Provide 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 Prior to construction, 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.

.5 Provide and maintain portable fire extinguishers during construction, in accordance with Part 6 of the National Fire Code of Canada.

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

1.6 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.

.2 For the purpose of this contract immediately investigate and provide a report to the Consultant on incidents and accidents that involve:

.1 A resulting injury that may or may not require medical aid but involves lost time at work by the injured person(s).
.2 Exposure to toxic chemicals or substances.
.3 Property damage.
.4 Interruption to adjacent and/or integral infrastructure operations with potential loss implications.

1.7 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 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.

1.2 Location of Services, Equipment and Fixtures

.1 Location of services, equipment, fixtures and outlets indicated 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.

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

.4 Submit field drawings to indicate relative position of various services and equipment when required by Consultant. Refer to requirements for interference drawings specified elsewhere.

.5 Location of site 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.

.6 Submit field drawings and interference to indicate relative position of various services and equipment.

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

.8 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.

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

.10 Submit two copies of interference drawings to Owner and Consultant in accordance with Section 01 33 00.

1.3 Records

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

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

1.4 Submittals

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

.2 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 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.

1.5 Execution

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

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

.3 Uncover Work to install ill-timed Work.

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

.5 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.

.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 in accordance with requirements of Contract Documents.

.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.

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

.13 Conceal pipes, ducts and wiring in floor, wall and ceiling construction of finished areas except where indicated otherwise.

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 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. 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 General

.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 as 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.

End of Section

PART 1 GENERAL

1.1 Section Includes

.1 References.
.2 Submittals.
.3 Definitions.
.4 Waste Management Goals for the Project.
.5 Documents.
.6 Waste Management Plan.
.7 Waste Audit.
.8 Waste Reduction Work Plan.
.9 Materials Source Separation Program.
.10 Disposal of Wastes.
.11 Scheduling.
.12 Storage, Handling and Protection.
.13 Application.
.14 Diversion of Materials.

1.2 Related Sections

.1 Section 01 33 00 Submittal Procedures
.2 Section 01 35 43 Environmental Procedures
.3 Section 01 74 11 Cleaning

1.3 References

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

1.4 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.

1.5 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.

1.6 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.

1.7 Documents

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

1.8 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.

1.9 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

1.10 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 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.

1.11 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.

1.12 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.

1.13 Scheduling

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

1.14 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 Designated Substances

.1 Refer to disposal requirements and Designated Substances reports listed in Section 02 41 00-Demolition.

3.3 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

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PART 1 GENERAL

1.1 Section Includes

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

1.2 Related Sections

.1 Closeout Submittals Section 01780

1.3 References

.1 Canadian Construction Documents Committee CCDC 2-2008, 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.

1.4 Inspection and Declaration

.1 Contractor's Inspection: The Contractor and all Sub-contractors 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, 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 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 drawings, 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.
.7 Specialty Engineers sign off.
.8 Final site survey.

1.2 Submittals

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

1.3 Definitions

.1 As-Built Drawings are those prepared by the Contractor as it constructs the project and upon which it documents the actual locations of the building components and site components and changes to the original contract documents.

.2 Record Drawings are those drawings prepared by the Consultant. These are the compendium of the original drawings, site changes known to the Consultant, and information taken from the Contractor's As-Built Drawings.

.3 The above definitions are founded on the OAA Joint Best practices Statement As-Built and Record Drawings dated October 21, 2010 and issued jointly by the OAA and the Ontario General Contractors Association.

1.4 General

.1 The General Contractor shall assemble and submit the following close-out submittals for approval:
  .1 General Drawings (GD) manual containing project components that are static, not operational in nature or do not require routine scheduled maintenance.
  .2 Operation and Maintenance (O&M) manual containing operating systems with moving parts or safety systems requiring regularly scheduled inspection, maintenance or monitoring.
  .3 Warranty Manual
  .4 Complete drawing file containing as-built drawing and Autocad site record drawings.
  .5 Maintenance material receipts.
  .6 Owners signed certificate that specified training has been provided and accepted.

.2 Document close-out submittals shall be submitted on a single labelled write-protected USB flash drive labelled "Closeout Documents" with:
  .1 Project Title;
  .2 Project Job Number;
  .3 Date

.3 The USB flash drive shall be fully indexed and shall include:
  .1 File Folders and subfolders created for content itemized in 3.1.
  .2 Table of Contents for each manual.

.4 All pdf content must be legible. Poor resolution content shall be substantiation for rejection of the entire submission.

.5 Autocad drawings shall be created using version 2007 or later. Where contract drawings are created in BIM, the BIM model shall be modified. PDF format shall be version 7.0 or later.

.6 Closeout submittals are to be delivered for review a minimum of 14 calendar days prior to application for certificate of Substantial Performance. Time frame is to allow the Owner to coordinate review of submission by the consultant and the owner. Consultant will review selected items. Consultant is reviewing that required as-built drawings, shop drawings, product data and warranties are included and that they are the approved version.

.7 Only copies of reviewed shop drawings and product data are to be submitted. Rejected and not reviewed shop drawings and product data are not to be included.

.8 Shop drawings for temporary works required to facilitate construction and that will be removed during or at the completion of construction do not have to be submitted in closeout submittals.

.9 Consultant may reject the closeout submission for failure to meet the quality or organizational requirements listed in this specification.

.10 The pdf document files of the GD Manual, O&M Manual and Warranty Manual shall be bound and securely protected so that content cannot be removed or added to each manual but only viewed or printed.

.11 Improper Content or organization shall be substantiation for rejection of the entire submission.

.12 Supplementary content such as tab pages and table of contents to organize and coordinate the file folders and manuals shall be created using typed text.

1.5 General Drawings (GD) Manual

.1 GD Manual file folder shall include but not be limited to the following content: building envelope, structure, static Building, Civil, Landscape, Mechanical, Electrical, and Communications System Components.

.2 The general arrangement of the file shall include:
- .1 Cover sheet and table of contents;
- .2 Folder for each Drawing series 100, 200, 300 etc. and folders for approved shop drawings and product data by specification section. Each section providing shop drawings shall contain a tab page;
- .3 In each drawing series provide the As-Built Drawings and Autocad record drawings in pdf format;
- .4 The approved shop drawing and product data and warranty folder shall:
  - .1 Include approved shop drawing log;
  - .2 Be organized by specification division and section number.
- .5 The Building envelope and Structure shop drawings and product data file shall include but not be limited to: concrete reinforcing, structural steel and decking, steel staircases and ladders, structural precast concrete, trusses and joists, masonry mixes, masonry reinforcement, metal fabrications, cladding and insulation, roofing, windows, doors and hardware, flooring, millwork, firestopping, sealants, paints, paint colour information, test, inspection and deficiency reports.
- .6 The static building mechanical , electrical and communications systems shop drawings and product data file shall include but not be limited to" plumbing pie and fittings, hangers and

guides, floor and roof drains, insulation, power cable and wiring, power receptacles, switches, cable trays, racking systems, data outlets, test, inspection, deficiency and acceptance reports, TAB reports.

.3 For As-Built Drawings recording field information, site instructions and change orders the drawings shall include but not be limited to the following content:
  .1 Field Information:
    .1 Foundation depth including stepped footing locations;
    .2 Structure reinforcement specified as a standard detail to be field located as directed;
    .3 Deviations in piping and ductwork systems and communication conduit and cable tray routing;
    .4 Valve tag numbers and function located on piping system drawings;
  .2 Site Instructions and Change Orders:
    .1 Dimensional and layout alterations;
    .2 Material and construction type changes;
    .3 Additional works added to the project;
    .4 Works removed from the project.

1.6 Operations and Maintenance (O&M) Manual

.1 O&M Manual shall be for operating systems with moving parts or safety systems requiring regularly scheduled inspection, maintenance or monitoring, typically but not restricted to operable walls , lockers, electric door operators, mechanical systems, electrical, automated control and alarm systems, elevators, rigging and anchorages.

.2 The O&M Manual file folder structure shall include:
  .1 Cover sheet and table of contents;
  .2 Name, address and telephone number of General Contractor and all subcontractors;
  .3 Folder for each Drawing series 100, 200, 300 etc. and folders for approved shop drawings and product data by specification section. Each section providing shop drawings shall contain a tab page;
  .4 In each drawing series provide the As-Built Drawings and Autocad record drawings in pdf format;
  .5 The approved shop drawing and product data and warranty folder shall:
    .1 Include approved shop drawing log;
    .2 Be organized by specification division and section number.
  .6 Owners signed certificate that specified training has been provided and accepted.
  .7 Reviewed shop drawings and product data sheets shall include but not be limited to:
    .1 Motorized equipment, HVAC equipment, kitchen equipment, plumbing fixtures, pressure vessels, hydronic systems, high and low pressure steam systems, ductwork, dampers and louvres, sprinkler systems, control systems, electrical distribution system components, UPS systems, fire alarm systems, lighting, door operators, electrically operated partitions and screens, and anchor points for rigging, lifeline connectors, elevators and lifts;
  .8 Schematics for HVAC systems, hydronic systems, steam systems, power distribution, and automated control systems.
  .9 Automated control system sequence of operations;
  .10 Manufacturer's published wiring, operating, maintenance and troubleshooting manuals;
  .11 TAB report and testing, commissioning, inspection and deficiency reports.
  .12 Inspection and manufacturer's warranty and guarantee certificates. Manufacturer's warranty and guarantee information shall include all pertinent contact information and clearly identify the starting date and duration of warranty period.
  .13 List of spare parts and maintenance tools provided and copy of signed delivery receipts.

1.7 As-Built Drawings and Samples

.1 Owner will supply a complete set of tender drawings including amendments drawings in hard copy and pdf format. The drawings are to be used as "As-Built Drawings" to record field information, site instructions and changes.

.2 As-Built Drawings shall be kept on site at all times during construction without exception but are not to be taken to construction areas. Change orders and Site Instructions are to be kept in a binder with the As-Built Drawings.

.3 Neatly record changes in permanent red fine line marker on the As-Built Drawings concurrently with the implementation.

.4 Site Instruction number and Change Order number shall be annotated on the As-Built Drawings.

1.8 Spare Parts

.1 Provide spare parts, in quantities specified in individual specification sections. 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. If requested, furnish evidence as to type, source and quality of products provided.

.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.

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

1.9 Maintenance Materials

.1 Provide maintenance and extra materials, in quantities specified in individual specification sections. Ensure maintenance materials provided are new, undamaged or defective, and of same quality and manufacture as products provided in Work. If requested, furnish evidence as to type, source and quality of products provided.

.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.

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

1.10 Special Tools

.1 Provide special tools, in quantities specified in individual specification sections. Ensure special tools provided are new, undamaged or defective, and of same quality and are provided or recommended by manufacturer of products provided in Work. If requested, furnish evidence as to type, source and quality of products provided.

.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.

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

1.11 Storage, Handling and Protection

.1 Store spare parts, maintenance materials, and special tools in manner to prevent damage or deterioration. Store in original and undamaged condition with manufacturer's seal and labels intact.

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

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

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

1.12 Warranty Manual

.1 The Warranty Manual file folder structure shall be organized by specification division and section number and shall include:
  .1 Cover sheet and table of contents;
  .2 Name, address and telephone number of General Contractor and subcontractor;
  .3 Folder for each Drawing series 100, 200, 300 etc. and;
  .4 All pertinent contact information for the manufacturer and supplier;
  .5 A duplicate copy of all manufacturer's warranties organized by specification section number.

.2 Each section shall contain a tab page.

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

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

.5 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.

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

.7 Co-execute submittals when required.

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

1.13 Final Survey

.1 Submit final site survey certificate in accordance with Section 01 71 00 - Examination and Preparation, certifying that elevations and locations of completed Work are in conformance, or non-conformance with Contract Documents.

1.14 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 USB Flash Drive File Structure

.1 General Layout:

- .1 Project Name
  - .1 GD Manual
    - .1 Cover Table of Contents
    - .2 Drawings
      - .1 Drawing List
        - .1. 100 Series
        - .2. 200 Series
          - .1 As Built/Record
          - .2 300 Series
            - i. As Built/Record
          - .3 400 Series
            - i. As Built/Record
          - .4 500 Series
            - i. As Built/Record
          - .5 Etc.

- .2 Shop Drawings Product Data Warranty
  - .1. Division xx
    - .1 Section xx xx xx
  - .2. Division xx
    - .1 Section xx xx xx
  - .3. Division xx
  - .4. Etc.
- .3 Inspection Reports
  - .1. Materials Testing
  - .2. Site Reports
- .4 Independent Specialty Engineers sign-off
- .5 Final survey drawing

.2 O&M Manual
- .1 Cover Table of Contents
- .2 Drawings
  - .1 Drawing List
  - .2 100 Series
    - .1. As Built
    - .2. Record
  - .3 200 Series
    - .1. As Built
    - .2. Record
  - .4 300 Series
    - .1. As Built
    - .2. Record
  - .5 Etc.
- .3 Shop Drawings Product Data Warranty
  - .1 Contents
    - .1. Division xx
    - .2. Section xx

.3. Division xx
.4. Etc.
.2 TAB Inspection Reports
.1. Inspection Reports
.1 Materials Testing
.2 Site Reports
.3 Air Balancing
.4 Automated Control Systems Operation
.5 Etc.
.4 Spare Parts listing.
.5 Maintenance Materials listing.
.6 Special Tools listing.
.3 Warranty Manual
.1 Cover Table of Contents
.2 Contractors
.3 Warrantees and Guarantees

.2 Typical shop drawing, product data and warranty folder contents in GD Manual

.1 Section xx xx xx
.2 1 Section xx xx xx Tab page
.3 2 Shop Drawing x
.4 3 Warranty

.3 Typical shop drawing, product data and warranty folder in O& M Manual

.1 Section 25 xx xx
.2 1 Section x Tab page
.3 2 Shop Drawing x
.4 3 Operating Instructions x
.5 4 Maintenance Instructions x
.6 5 Warranty x

.4 Specialty Engineer Sign Offs

.5 Final Site Survey

.6 USB flash drive file structure shall be edited to suit the project type.

End of Section

PART 1 GENERAL

1.1 General

.1 Conform to the requirements of Division 1.

1.2 References

.1 The National Building Code of Canada 2020, Part 8-Safety Measures on Construction and Demolition Sites.
.2 CSA Group (CSA)
  .1 CSA S350-M1980 (R2003) Code of Practice for Safety in Demolition of Structures
.3 ASTM International (ASTM)
  .1 ASTM F710-22 Standard Practice for Preparing Concrete Floors to Receive Resilient Flooring
.4 Ontario Provincial Regulations
  .1 Ontario Regulation 102/94 Waste Audits and Waste Reduction Work Plans.
  .2 Ontario Regulation 103/94 Environmental Protection Act.
  .3 Ontario Regulation 213/07 The Fire Code.
  .4 Ontario Regulation 232/98 Landfilling Sites.
  .5 Ontario Regulation 278/05 Designated Substance - Asbestos on Construction Projects and in Buildings and Repair Operations.
  .6 Ontario Regulation 347 Environmental Protection Act, General — Waste Management.
  .7 Ontario Regulation 332/12 The Building Code.
.5 The Workplace Health and Safety Act, and Regulations for Construction Projects.
.6 The Contractors Health and Safety Policy.
.7 Laws, rules and regulations of other authorities having jurisdiction.

1.3 Submittals

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

.2 Submit detailed written schedule, methodology and proposed procedures for demolition, including a Safe Work Plan for review prior to commencement of demolition.

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

.4 Drawings for structural elements of the demolition process including shoring, underpinning and installation of new lintels or beams in existing load bearing walls, shall bear signature and stamp of qualified professional engineer registered in the Province of Ontario.

.5 Submit proposed dust-control measures.

.6 Submit proposed noise-control measures.

.7 Submit schedule of demolition activities indicating the following:
  .1 Detailed sequence of demolition and removal work, including start and end dates for each activity.
  .2 Dates for shutoff, capping, and continuation of utility services.
.8 If hazardous materials are encountered and disposed of, landfill records indicating receipt and acceptance of hazardous wastes by a landfill facility licensed to accept hazardous wastes.

.9 At Project Closeout: Submit record drawings in accordance with Section 01 78 00. Identify and accurately locate capped utilities and other subsurface structural, electrical, or mechanical conditions

1.4 Permits

.1 Obtain and pay for all permits and comply with all laws, rules, ordinances, and regulations relating to Demolition of Building and preservation of Public Health and Safety.

.2 The Consultant will complete General Review during demolition in accordance with the Ontario Building Code. All other engineering required for shoring design and for other structural elements of the demolition work will be completed by the Contractor's own engineer and paid for by the Contractor.

1.5 Waste Management Plan

.1 All work of this section shall be completed in accordance with the contractors approved Waste Management Plan specified in Section 01 74 19.

1.6 Definitions

.1 Chemical Waste: Includes petroleum products, bituminous materials, salts, acids, alkalis, herbicides, pesticides, organic chemicals and inorganic wastes.

.2 Demolition Waste: Building materials and solid waste resulting from construction, remodeling, repair, cleanup, or demolition operations that are not hazardous. This term includes, but is not limited to, asphalt concrete, Portland cement concrete, brick, lumber, gypsum wallboard, cardboard and other associated packaging, roofing material, ceramic tile, carpeting, plastic pipe, and steel. The materials may include rock, soil, tree stumps, and other vegetative matter resulting from land clearing and landscaping for construction or land development projects.

.3 Environmental Pollution and Damage: The presence of chemical, physical, or biological elements or agents which adversely affect human health or welfare; unfavorably alter ecological balances of importance to human or animal life; affect other species of importance to humanity; or degrade the utility of the environment for aesthetic, cultural or historical purposes.

.4 Inert Fill: A permitted facility that accepts inert waste such as asphalt and concrete exclusively for the purpose of disposal.

.5 Inert Solids/Inert Waste: Non-liquid solid waste including, but not limited to, soil and concrete that does not contain hazardous substances or soluble pollutants at concentrations in excess of water-quality standards established by a regional water board and does not contain significant quantities of decomposable solid waste.

.6 Landfill: A landfill that accepts non-hazardous materials such as household, commercial, and industrial waste, resulting from construction, remodeling, repair, and demolition operations. A landfill must have a solid waste facilities permit from the Ministry of the Environment and be in conformance to O. Reg 232/98.

.7 Recycling: The process of sorting, cleansing, treating and reconstituting materials for the purpose of using the altered form in the manufacture of a new product. Recycling does not include burning, incinerating or thermally destroying solid waste.

.8 Remove: Remove and legally dispose of items, except those identified for use in recycling, re-use, and salvage programs.

.9 Reuse: The use, in the same or similar form as it was produced, of a material which might otherwise be discarded.

.10 Solid Waste: All putrescible and non-putrescible solid, semisolid, and liquid wastes, including garbage, trash, refuse, paper, demolition and construction wastes, abandoned vehicles and parts thereof, discarded home and industrial appliances, dewatered, treated, or chemically fixed sewage sludge which is not hazardous waste, manure, vegetable or animal solid and semisolid wastes, and other discarded solid and semisolid wastes. "Solid waste" does not include hazardous waste, radioactive waste, or medical waste as defined or regulated by law.

1.7 Quality Assurance

.1 Demolition Firm Qualifications: Demolition contractor shall be an experienced firm that has successfully completed demolition Work similar to that indicated for this Project.

.2 Regulatory Requirements: Comply with governing regulations before starting demolition. Comply with hauling and disposal regulations of authorities having jurisdiction. Obtain and pay for all permits required.

.3 Pre-demolition Conference: Conduct a conference at Project site.
.1 Review the environmental goals of this Project and make a proactive effort to increase awareness of these goals among all labor forces on site.
.2 Review schedule and scheduling procedures.
.3 Review health and safety procedures.
.4 Review of Project conditions including review of record photographs.

1.8 Project Conditions

.1 Construct safety barriers, barricades, fencing and hoarding to separate public from work areas as described in Section 01 56 00.

.2 The Owner assumes no responsibility for the actual condition of the structures to be demolished.

.3 Conditions existing at the time of inspection for bidding purposes will be maintained by the Owner insofar as practicable. Variations within the structures may occur by the Owner's salvage operations prior to start of demolition.

1.9 Designated Substances

.1 Refer to Limited Designated Substances Survey Report (Washroom Renovation), O'Neill Collegiate and Vocational Institute 301 Simcoe St N, Oshawa Ontario prepared by Maple Environmental Inc. dated January 12, 2026

.2 Should any other material not identified in the above referenced reports resembling asbestos or other hazardous substances be encountered in course of demolition work, immediately stop work and notify the Owner's Representative. Refer to Section 01 41 00.

.3 All designated substances abatement, removal and disposal shall be completed in accordance with O. Reg 278/05 and all other applicable legislation.

PART 2 PRODUCTS

2.1 Materials

.1 Provide all materials necessary for temporary shoring. On completion, remove temporary materials from site.

.2 All building materials removed from the building shall become the property of the Contractor unless specified otherwise and shall be reused in new construction or removed from the Site.

.3 All concrete, masonry, asphalt and similar materials shall be crushed prior to disposal.

2.2 Salvage

.1 All items of salvageable value must be salvaged.

.2 Provide a schedule of items to be salvaged and clearly indicate which items are to be retained by Owner. Clearly identify and tag each salvageable item.

.3 Transport salvaged items from the site as they are removed.

.4 Items of salvageable value to the Contractor may be removed from the structure as the work progresses, if such items are not claimed by the Owner.

2.3 Reuse

.1 Salvage and reuse materials as indicated on the drawings.

2.4 Recycle

.1 All materials from demolition and land clearing which can be recycled through local municipal programs and which is not scheduled for salvage shall be sorted and separated in accordance with Regional, Provincial and Municipal standards and regulations.

.2 Provide recycling receptacles for the duration of construction activities at the building site.

PART 3 EXECUTION

3.1 Examination

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

.2 Verify that utilities have been disconnected and capped.

.3 Survey condition of the building to determine whether removing any element might result in a structural deficiency or unplanned collapse of any portion of the structure or adjacent structures during demolition.

.4 Retain a licensed and qualified civil or structural engineer to provide analysis, including calculations, necessary to ensure the safe execution of the demolition work.

.5 Perform surveys and tests as the Work progresses to detect hazards resulting from demolition activities.

.6 Preliminary Survey:
.1 The Demolition Plans indicate the general extent of existing conditions based upon drawings provided by the Owner and existing site conditions. Review all areas of work to determine full extent of areas to be demolished, altered or renovated and become familiar with actual conditions and extent of work required.
.2 Before commencing demolition operations, examine Site and provide engineering survey to determine type of construction, condition of structure, and Site conditions. Assess strength and stability of damaged or deteriorated structures.
.3 Assess potential effect of removal of any part or parts on the remainder of structure before such part(s) are removed.
.4 Assess effects of demolition at adjacent structures and consider need for underpinning, shoring and/or bracing.
.5 Investigate for following conditions:
.1 load bearing walls and floors
.2 structure suspended from another
.3 effects of soils, water, lateral pressures on retaining or foundations walls
.4 presence of tanks and other piping systems
.5 presence of designated substances and hazardous materials.

.7 After determining demolition methods, determine area of possible vibration. Carefully inspect beyond those adjacent areas. List potential damage areas and photograph each for record purposes before starting work.

3.2 Preparation

.1 Erect and maintain dustproof and weatherproof partitions as required to prevent spread of dust, fumes and smoke to other parts of building. Maintain fire exits. On completion, remove partitions and make good surfaces to match adjacent surfaces of building.

.2 Provide all shoring and bracing required for the execution of the work.

.3 Ensure all sedimentation controls as required are in place prior to commencement of demolition activities.

.4 Before commencing demolition, verify that existing water, gas, electrical and other services in areas being demolished are cut off, capped diverted or removed as required. Post warning signs on electrical lines and equipment which must remain energized to serve adjacent areas during period of demolition.

.5 Conduct demolition operations and remove materials from demolition to ensure minimum interference with roads, streets, walks, and other adjacent occupied and utilized facilities.

.6 Do not close or obstruct streets, walks, or other adjacent occupied or utilized facilities without permission from authorities having jurisdiction. Provide alternate routes around closed or obstructed traffic ways if required by governing regulations.

3.3 Utilities

.1 Contact authorities or utility companies for assistance in locating and marking services passing under, through, overhead or adjacent to structure to be demolished. Such services include:

.1 Electrical power lines
.2 Gas mains
.3 Communication cables
.4 Fibre optic cables
.5 Water lines.
.6 Drainage piping (storm and sanitary).

.2 Before disconnecting, removing, plugging or abandoning any existing utilities serving the building:
.1 Notify the Owner, applicable utility companies, and local authorities having jurisdiction.
.2 Cut off and cap utilities at the mains on the property or in the street as required by the Owner and responsible utility company. Maintain fire protection to the existing buildings at all times.
.3 Remove, cut off and plug, or cap all utilities within the existing building areas to be demolished, except those designated to remain

3.4 Protection

.1 Erect and maintain temporary protection, such as walks, fences, railings, canopies, and covered passageways, where required by authorities having jurisdiction. Maintain such areas free of snow, ice, water and debris. Lighting levels shall be equal to that prior to erection.

.2 Provide safe access and egress from working areas using entrances, hallways, stairways or ladder runs, protected to safeguard personnel using them from falling debris.

.3 Do not interfere with use and activities of adjacent buildings and site. Maintain free and safe passage to and from buildings.

.4 Where demolition operations prevent normal access to adjacent properties, provide and maintain suitable alternative access.

.5 Provide flagmen where necessary or appropriate, to provide effective and safe access to site to vehicular traffic and protection to Owner's personnel. Refer to Division 1 for safety requirements.

.6 Ensure that all necessary controls are in place at the beginning of each work period which will prevent the spread of contaminated material beyond the work area limits. Stop work immediately if there exists any possibility of the spread of contaminated materials.

.7 Keep dust from entering existing facilities and areas of building not affected by the Work. Comply with Ministry of Health requirements regarding debris control.

.8 Ensure scaffolds, ladders, equipment and other such equipment are not accessible to public. Protect with adequate fencing or remove and dismantle at end of each day or when no longer required.

.9 Take precautions to guard against movement, settlement or collapse of adjacent structures, services or driveways. Be liable for such movement, settlement or collapse caused by failure to take necessary precautions. Repair promptly such damage when ordered.

.10 If Owner considers additional bracing and shoring necessary to safeguard and prevent such movement or settlement, install bracing or shoring upon Owner's orders.

.11 Particular attention shall be paid to prevention of fire and elimination of fire hazards which would endanger new work or existing premises.

.12 Protect existing adjacent work against damages which might occur from falling debris or other causes due to work of this Section.

.13 At all times protect the structure from overloading.

.14 Provide protection around floor and/or roof openings.

.15 Protect from weather, parts of adjoining structures not previously exposed.

.16 Protect interiors of building parts not to be demolished from exterior elements at all times.

.17 At end of each day's work, leave work in safe condition so that no part is in danger of toppling or falling.

3.5 Temporary Ventilation

.1 Provide all required temporary ventilation for demolition work.

3.6 Environmental Controls

.1 Comply with provincial and municipal regulations pertaining to water, air, solid waste, recycling, chemical waste, sanitary waste, sediment and noise pollution.

.2 Dust Control, Air Pollution, and Odour Control: Prevent creation of dust, air pollution and odors.
- .1 Use temporary enclosures and other appropriate methods to limit dust and dirt rising and scattering in air to lowest practical level.
- .2 Store volatile liquids, including fuels and solvents, in closed containers.
- .3 Properly maintain equipment to reduce gaseous pollutant emissions.

.3 Noise Control: Perform demolition operations to minimize noise.
- .1 Provide equipment, sound deadening devices, and take noise abatement measures that are necessary to comply with municipal regulations.

.4 Salvage, Re-Use, and Recycling Procedures:
- .1 Identify re-use, salvage, and recycling facilities.
- .2 Develop and implement procedures to re-use, salvage, and recycle demolition materials.
- .3 Identify materials that are feasible for salvage, determine requirements for site storage, and transportation of materials to a salvage facility.
- .4 Source-separate clean and uncontaminated demolition materials including, but not limited to the following types:
  - .1 Concrete, Concrete Block, Concrete Masonry Units (CMU), Brick.
  - .2 Metal (ferrous and non-ferrous).
  - .3 Wood.
  - .4 Glass.
  - .5 Plastics and Insulation.
  - .6 Gypsum Board.
  - .7 Porcelain Plumbing Fixtures.
  - .8 Fluorescent Light Tubes.
  - .9 Paper: Bond, Newsprint, Cardboard, Paper, Packaging Materials.
  - .10 Other materials as appropriate.

3.7 Performance

.1 Ensure demolition work is supervised by competent foreman at all times.

.2 Demolition shall proceed safely in systematic manner. Work on each floor level shall be complete before commencing work on supporting structure and safety of its supports are impaired. Parts of building which would otherwise collapse prematurely shall be securely shored. Walls and piers shall not be undermined.

.3 Until acceptance, maintain and preserve active utilities traversing premises.

.4 Provide enclosed chutes for disposal of debris from heights more than 1 storey in accordance with CSA S350.

.5 Maintain safety of site by shoring below-grade-structures and excavations resulting from demolition against collapse.

3.8 Demolition

.1 Review demolition procedures to ensure no personnel or equipment are located or working without additional safe working platforms or working surface adequate to support the operations.

.2 Any damage caused to the adjacent buildings or properties by the neglect of the Contractor or any of his forces shall be made good at the expense of the Contractor including all costs and charges which may be claimed by the Owner for damages suffered.

.3 Demolish in a manner to minimize dusting. Keep dusty materials wetted at all times.

.4 Demolition: Use methods required to complete Work within limitations of governing regulations and as follows:
- .1 Locate demolition equipment throughout the building and remove debris and materials so as not to impose excessive loads on supporting walls, floors, or framing.
- .2 Demolish concrete and masonry in sizes that will be suitable for acceptance at recycling or disposal facilities.
- .3 Break up and remove concrete slabs on grade in small sizes, suitable for acceptance at recycling or disposal facilities, unless otherwise shown to remain.
- .4 Remove all finishes, fixtures, fitments and services as indicated
- .5 Damages: Promptly repair damages to adjacent facilities caused by demolition operations.
- .6 Prevent access to excavations by means of fences or hoardings.

3.9 Selective Demolition

.1 Carefully dismantle and remove all items in as shown and as necessary to complete the work.

.2 Salvage items scheduled for reuse or to be handed over to the Owner.

.3 Particular attention shall be paid to prevention of fire and elimination of fire hazards which would endanger the existing buildings.

.4 Where existing flooring is to be removed from floor slabs to remain, including ceramic tile flooring, carefully remove flooring, grout, adhesives, waterproofing membranes and the like down to the base slab. Patch and repair slab where damaged with concrete or acceptable leveling compound in accordance with new flooring manufacturer's instructions and ASTM F710. Refer to original

building drawings and remove and replace existing concrete floor toppings as necessary and where required.

.5 Return areas to condition existing prior to the start of the work unless indicated otherwise.

3.10 Handling of Demolished Materials

.1 Conform to the approved Waste Management Plan.

.2 Do not allow demolished materials to accumulate or be stored on-site for more than 5 days.

.3 Do not burn, bury or otherwise dispose of rubbish and waste materials on project site.

.4 Pallet and shrink-wrap materials scheduled for re-use and stockpile where directed on site.

.5 Disposal: Transport demolished materials off Owner's property and legally reuse, salvage, recycle, or dispose of materials. Legally transport and dispose of materials that cannot be delivered to a source separated or mixed recycling facility to a transfer station or disposal facility that can legally accept the materials for the purpose of disposal.

.6 Deliver to facilities that can legally accept new construction, excavation and demolition materials for purpose of re-use, recycling, composting, or disposal.

3.11 Cleaning

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

.2 Clean adjacent streets and driveways of dust, dirt and materials caused by demolition operations.

.3 Reinstate areas and existing works outside areas of demolition to conditions that existed prior to commencement of work.

.4 Upon completion of demolition work, remove debris, trim surfaces and leave work site clean.

.5 Video storm and sanitary sewers and jet clean where debris may have accumulated

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 05 31 00 Steel Deck
.4 Section 05 50 00 Metal Fabrications

1.3 References

.1 ASTM International, (ASTM)
  .1 ASTM A108-18 Standard Specification for Steel Bar, Carbon and Alloy, Cold-Finished
  .2 ASTM A123/A123M-17 Standard Specification for Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products
  .3 ASTM A153/A153M-23 Standard Specification for Zinc Coating (Hot-Dip) on Iron and Steel Hardware
  .4 ASTM A307-21 Standard Specification for Carbon Steel Bolts, Studs, and Threaded Rod 60 000 PSI Tensile Strength
  .5 ASTM A653/A653M-23 Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process
  .6 ASTM A1011/A1011M-23 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
  .7 ASTM F3125/F3125M-22 Standard Specification for High Strength Structural Bolts and Assemblies, Steel and Alloy Steel, Heat Treated, Inch Dimensions 120 ksi and 150 ksi Minimum Tensile Strength, and Metric Dimensions 830 MPa and 1040 MPa Minimum Tensile Strength
.2 CSA Group (CSA)
  .1 CSA G40.20/G40.21-13 (R2018) General Requirements for Rolled or Welded Structural Quality Steel/Structural Quality Steel
  .2 CSA G164-18 Hot Dip Galvanizing of Irregularly Shaped Articles.
  .3 CSA S16:19 Design of Steel Structures.
  .4 CSA S136-16 North American Specification for the Design of Cold Formed Steel Structural Members
  .5 CSA W47.1:19 Certification of Companies for Fusion Welding of Steel Structures.
  .6 CSA-W48.1-M1991 (R1998) Carbon Steel Covered Electrodes for Shielded Metal Arc Welding
  .7 CSA-W55.3-08 (R2013) Resistance Welding Qualification Code for Fabricators of Structural Members Used in Buildings.
  .8 CSA W59-18 Welded Steel Construction (Metal Arc Welding).
  .9 CSA W178.1-18 Certification of Welding Inspection Organizations.
  .10 CSA W178.2-18 Certification of Welding Inspectors.
.3 American Welding Society (AWS)
  .1 AWS A2.4:2020 Standard Symbols for Welding, Brazing, and Nondestructive Examination
.4 Structural Steel Painting Council
  .1 SSPC-SP 6-91 Commercial Blast Cleaning.
.5 Canadian Institute of Steel Construction (CISC)/Canadian Paint Manufacturer's Association (CPMA)

.1 CISC/CPMA 1-73a Quick-Drying, One-Coat Paint for Use on Structural Steel.

.6 American Institute of Steel Construction (AISC)

.1 Code of Standard Practice for Steel Buildings and Bridges, Section 10, Architectural Exposed Structural Steel, latest edition.

.7 The National Building Code of Canada.

1.4 Submittals

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

.2 Submit shop and erection drawings. Submit typical details of connections and any special connections for review before preparation of shop drawings. Assume responsibility for the accuracy of Work. Review of submitted shop drawings is to ensure only that the Contract Documents are being correctly interpreted.

.3 Professional Engineer responsible for connection design shall sign and seal each shop drawing.

.4 Show on shop drawings the size, spacing, and the location of structural steel members; connections; attachments; reinforcing; anchorage and required inserts; and all necessary plans, elevations and details.

.5 Show splice locations and details.

.6 Welded connections shall be designated by welding symbols in compliance with AWS A2.4:2020 and indicate clearly net weld lengths.

.7 Submit design calculations if requested by the Consultant.

.8 Submit diagrams showing methods of erection.

.9 Field Work Drawings shall be submitted as shop drawings.

.10 Notify Consultant in writing of any deviations in shop drawings from the requirements of the Contract Documents.

.11 Submit a schedule of fabrication to the Consultant and the Testing Agency, prior to commencement of fabrication.

1.5 Qualifications

.1 Undertake welding and/or welding inspection by welders fully approved to one or more of the reference codes and standards where applicable.

1.6 Quality Assurance

.1 Connections:

.1 Connections designed by Engineer: Submission of shop drawings for connection which have been detailed on Drawings shall represent acceptance by Contractor that connection can be executed successfully.

.2 Design of other connections which cannot be selected from standard designs tabulated in CISC Handbook of Steel Construction shall be by a Professional Engineer, licensed in the Province of Ontario, experienced in structural steel connection design.

.3 Consultant will review connection arrangement to verify general conformance with overall design concept of structure.
.4 Connection design engineer shall be insured for 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.
.5 Provide connections adequate to resist reaction of beam, when beam is loaded to maximum flexural capacity under uniformly distributed load, unless reaction or connection detail is shown on Drawings.
.1 Provide flexible beam connections for unrestrained members in accordance with CSA S16.1, unless shown otherwise on Drawings.
.2 Select connections, wherever possible, from standard designs tabulated in current edition of CISC Handbook of Steel Construction, except that length of beam web angles shall not be less than half the depth of beam, and single angles shall not be used.
.3 Provide direct connections to flanges of spandrel beams (exterior perimeter beams) to restrain twisting.

.2 Design:
.1 Connections:
.1 Provide bolted or welded connections, unless shown otherwise on Drawings.
.2 Use high strength bolts to ASTM F3125 for all connections.
.3 Use slip resistant (friction-type) connections for bolted joints designed to resist reversible forces.
.4 Provide tension adjustment hardware at rod type bracing and at flat bar type bracing.
.5 Do not permit connections to encroach on clearance lines required for installation of Work of other Sections.

.3 Random Splicing: Obtain in writing from Consultant, prior to commencement of shop drawings, special requirements that will be imposed as a necessary condition of acceptance of members with randomly located butt welded splices.

.4 All edge perimeter angles and bent plates installed at roof framing level shall be joined by butt weld splices designed for full tension capacity of members being joined.

1.7 Tolerances

.1 In addition to tolerances specified in CSA S16, erect shelf angles and sash angles attached to steel frame within a tolerance of 3 mm plus or minus, with abutting ends of members at the same level.

1.8 Inspection and Testing

.1 Refer to Section 01 45 00 – Quality Control.

.2 Inspection and testing of materials and shop fabrication of Work of this Section, and field quality control, will be performed by an independent Inspection and Testing Company. Refer to Section 01 45 00 - Quality Control.

.3 The Inspection and Testing Company shall meet qualification requirements of CSA W178.1 and shall be certified by the Canadian Welding Bureau in Category 1 Buildings.

.4 Welding Inspectors and supervisors shall be certified by Canadian Welding Bureau to CSA W178.2, to minimum level 2 certification.

.5 Provide free access for inspectors to all places work is being performed, whether on site or off.

.6 Mill inspection shall ensure that materials conform to specified requirements. Mill test reports, properly correlated to the materials, will be accepted in lieu of physical tests.

.7 Shop inspection shall ensure that structural steel is fabricated in accordance with the shop drawings, and the specified fabrication and welding procedures.

.8 The cost of inspection and testing of splices introduced by the fabricator and not required on the Contract Documents will be paid by the Contractor.

.9 Inspection and Testing Company when appointed shall carry out shop inspection to verify:
- .1 Structural materials and paint conform to Specifications. Mill test reports, properly correlated to the materials, will be accepted in lieu of physical tests of structural materials.
- .2 Fabrication and welding conforms to Specifications and dimensioned shop drawings.
- .3 Shop cleaning and preparation and prime painting to conform to specified requirements.
- .4 Surfaces inaccessible for cleaning and painting after assembly are treated before assembly.
- .5 For surfaces painted with zinc rich paint or zinc primer, specified surface preparation is followed and specified paint thickness is applied.

.10 Non-destructive Testing of Welded Connections: Carry out non-destructive testing of welded connections chosen at random as follows:
- .1 Check and record steel member sizes for 20% of columns, beams and girders.
- .2 Check 5% of all welds by magnetic particle inspection.
- .3 Check 25% of moment connections and all connections subject to direct tension involving use of full penetration groove welds by ultrasonic testing.
- .4 Check 10% (minimum 2 per connection) in accordance with Section 23 of CSA S16 of pretensioned connections including main building bracing connections.

.11 More frequent testing and inspection shall be completed if random tests described above are not satisfactory. These costs are to be paid by the Contractor.

1.9 Shipping, Handling and Storage

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

.2 Deliver products that are only supplied under work of this Section to those who are responsible for their installation, to the work site as directed and to meet construction schedule.

.3 Handle and store structural steel in such a manner that no damage, including corrosion, is caused to the stored or erected work, or to other property.

.4 Store structural steel off of ground on timber supports.

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 Rolled shapes, hollow structural sections, plates and rods: new steel, in compliance with CSA and/or ASTM Standards indicated on Structural Drawings.

.2 Welding Electrodes: to meet the requirements set forth in the applicable standard of the CSA W48 Series on welding electrodes. (Any process which produces deposited weld metal meeting the requirements of the applicable W48 Series Standard for any grade of arc welding electrodes shall be accepted as equivalent to the use of such electrodes.)

.3 High Strength Bolts: to meet specified requirements of ASTM F3125

.4 Anchor Bolts: To CSA-G40.20/G40.21, Grade 300W.

.5 Shop Coat Paint:
.1 Interior structural steel: To meet specified requirements of CISC/CPMA 1-73a and compatible with Master Painters Institute INT 5.1S or 5.1X Institutional low odour/low VOC semi-gloss finish. Colour to be grey.

.6 Galvanizing: hot dipped with zinc coating to CSA G164, ASTM A123 or ASTM A153.

PART 3 EXECUTION

3.1 Fabrication

.1 Fabricate work of this Section in compliance with CSA S16, and as specified following.

.2 Connections:
.1 Make bolted or welded connections.
.2 Use high strength bolts unless otherwise noted on Drawings.
.3 Use friction type high strength bolts for the connections of bracing members (diagonal kickers) resisting the effects of applied lateral loads. Provide tension adjustment at flat bar and rod type lateral bracing.
.4 Do not permit connections to encroach on the clearance lines required for the installation of work of this Section.

.3 Beam Connections:
.1 Provide beam connections adequate to resist the reactions produced by the framing or load conditions.
.2 Provide beam to column connections that apply vertical reaction with negligible eccentricity at the connecting face of the column, such as single or double beam web connections, end plate connections or un-stiffened seats, unless otherwise shown on Drawings. Submit for review, in advance of the preparation of shop drawings, connections which do not meet these requirements.
.3 Provide connections complying with the requirements of the CISC Handbook of Steel Construction, except that the length of beam web angles shall not be less than half the depth of the beam and single angles shall not be used.
.4 Provide direct connections to flanges of spandrel beams to restrain twisting.

.4 Holes in Structural Members:
.1 Punch holes 11 mm to 27 mm in diameter as required for attaching the work of other Sections to structural steel members. Locate holes so that no appreciable reduction of the strength of members is caused.

.2 Provide holes for pipes and ducts, and reinforce openings as indicated on drawings. Cutting of holes in structural members in the field will not be permitted except with written approval of the Consultant.
.3 Provide effective drainage holes to prevent the accumulation of water in tubular members.

.5 Member Separators: Provide separators at approximate spacing of 1200 mm o.c. for double beams and channels as follows:
.1 For beams and channels 225 mm or less in depth: one or two rows of pipe separators.
.2 For beams and channels over 225 mm in depth: channel separators, unless otherwise detailed on Drawings.

.6 Built up Compression Members General Requirements: Comply with the requirements of CSA-S16, for all built up compression members.

.7 Column Bearing Plates: Mill column bearing plates under column bearing unless plate is sufficiently flat to give adequate contact bearing between column and plate.

.8 Structural Steel Painting: All prime painting shall be shop applied and the responsibility of the steel fabricator. Refer to specific priming requirements specified in Section 09 91 23 - Interior Painting.
.1 Paint in accordance with manufacturer's published directions. Paint steel in the shop under cover. Keep painted members under cover until the paint has dried.
.2 Clean and prepare surfaces, as appropriate for paint specified, in accordance with Commercial Blast Cleaning is only required where zinc rich paint is to be applied. All other steel to be or clean steel in compliance with SSPC SP6 where zinc rich paint is shop applied.
.3 Where paint is applied adjacent to welded joints, remove it to bare metal for a distance of at least 50 mm beyond sides of joints.
.4 Do not paint surfaces and edges to be field welded, contact surfaces of friction type connections assembled by high strength bolts, surfaces encased in or in contact with concrete.
.5 Do not paint surfaces to receive cementitious fireproofing.
.6 Prime steel members to receive Intumescent Fireproofing in accordance with fireproofing manufacturer's recommendations. Refer to Section 07 81 23.

.9 Galvanizing: Galvanize members as indicated and in accordance with reference standards, after shop welding is complete.
.1 Steel members, fabrications, and assemblies shall be galvanized after fabrication by the hot dip process in accordance with CSA G164 or ASTM A123.
.2 Bolts, nuts, washers, iron, and steel hardware components shall be galvanized in accordance with CSA G164 or ASTM A153.
.3 Coating Requirements:
.1 Weight: the weight of the galvanized coating shall conform with Table 1 of CSA G164 or paragraph 6.1 of ASTM A123 and Table 1 of ASTM A153 (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.
.4 The integrity of the coating shall be determined by visual inspection and coating thickness measurements.
.5 Adhesion: the galvanized coating shall be sufficiently adherent to withstand normal handling.

3.2 Examination

.1 Verify, before delivery of structural steel, that work of other Sections on which work of this Section is dependent is correctly installed and located.

3.3 Preparation

.1 Supply anchor bolts, base and bearing plates and other members to be built in under work of other Sections as the work progresses. Cooperate with installers of this work and provide instructions for setting items to be built in.

3.4 Erection

.1 Comply with CSA S16 and work site safety plans in erection of work of this Section.

.2 Make adequate provision for horizontal and vertical erection loads and for sufficient temporary bracing to keep structural frame plumb and in true alignment until the completion of erection, and the installation of masonry, concrete work, and floor and roof decks which provide the necessary permanent bracing.

.3 Provide temporary steel members as may be required for erection purposes and remove them when no longer required.

.4 Installation of Bearing and Column Base Plates: Install bearing plates and standard wall anchors for beams bearing on masonry or concrete.
  .1 Set loose beam bearing plates and column base plates, at proper elevation, true and level, with steel shims, ready for grouting as specified under work of other Sections.
  .2 Set loose bearing plates and/or levelling plates to be cast into concrete.

3.5 Coating Touch-Up

.1 Clean welds with wire brushes and wash down with clean water to ensure no residue from electrodes is present.

.2 After erection, give one coat of prime coat or zinc rich paint as applicable and specified for shop coat to field bolts, field connections, burnt areas, and abrasions or damage to shop coats.

.3 Touch up all areas with a specified paint film thickness.

.4 Give areas of bare metal on galvanized members two coats of zinc-rich paint. Repair coating on architecturally exposed galvanized metals in accordance with reference standards and as directed by the Consultant. Replace any materials where damage cannot be repaired to the satisfaction of the Consultant.

3.6 Field Quality Control

.1 Inspection and Testing Company, when appointed as specified in Source Quality Control elsewhere in this Section, shall perform:
  .1 Inspection of erection and fit-up, including placing, plumbing, levelling and temporary bracing and conformance with specified tolerances.
  .2 Inspection of bolted connections, including verification that ASTM A307, ASTM F3125 snug tight only bolts, and ASTM F3125 pre-tensioned bolts have been installed and used appropriately, and that threads are excluded from shear plane where required.

.3 Inspection of welded joints, including slag removal.
.4 General inspection of field cutting and alterations; report immediately to Consultant, any alterations or cutting not shown on reviewed shop drawings.
.5 General inspection of shop coating touch-up.
.6 Inspection of zinc primer and zinc-rich paint, including surface preparation and coating thickness.

3.7 Defective Work

.1 Variations in excess of specified tolerances, and failure of materials or workmanship to meet requirements of this specification, and which cannot be repaired by approved methods, will be considered defective Work performed by this Section.

.2 Replace defective Work, as directed by Consultant.

.3 Pay for additional inspection and testing, redesign, corrective measures, and related expenses if Work has proven to be deficient.

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

1.3 References

.1 The Ontario Building Code.
  .1 MMAH Supplementary Standard SB-8, September 14, 2012. Design, Construction and Installation of Anchorage Systems for Fixed Access Ladders.
.2 ASTM International (ASTM)
  .1 ASTM A53/A53M-22 Standard Specification for Pipe, Steel, Black and Hot Dipped, Zinc Coated, Welded and Seamless.
  .2 ASTM A240/A240M-23a Standard Specification for Chromium and Chromium-Nickel Stainless Steel Plate, Sheet, and Strip for Pressure Vessels and for General Applications
  .3 ASTM A264-12(2019) Standard Specification for Stainless Chromium-Nickel Steel-Clad Plate
  .4 ASTM A269/A269M-22 Standard Specification for Seamless and Welded Austenitic Stainless Steel Tubing for General Service
  .5 ASTM A276/A276M-24a Standard Specification for Stainless Steel Bars and Shapes
  .6 ASTM A307-21 Standard Specification for Carbon Steel Bolts and Studs, 60 000 PSI Tensile Strength.
  .7 ASTM A312/A312M-24b Standard Specification for Seamless, Welded, and Heavily Cold Worked Austenitic Stainless Steel Pipes
  .8 ASTM A380/A380M-17 Standard Practice for Cleaning, Descaling, and Passivation of Stainless Steel Parts, Equipment, and Systems
  .9 ASTM A385/A385M-22 Standard Practice for Providing High-Quality Zinc Coatings (Hot-Dip)
  .10 ASTM A511/A511M-21a Standard Specification for Seamless Stainless Steel Mechanical Tubing and Hollow Bar
  .11 ASTM A1008/A1008M-23e1 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-23 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 C1107/C1107M-20 Standard Specification for Packaged Dry, Hydraulic-Cement Grout (Nonshrink)
  .14 ASTM D1187/D1187M-97(2018) Standard Specification for Asphalt-Base Emulsions for Use as Protective Coatings for Metal
  .15 ASTM D6386-22 Standard Practice for Preparation of Zinc (Hot Dip Galvanized) Coated Iron and Steel Product and Hardware Surfaces for Painting
  .16 ASTM F593-22 Standard Specification for Stainless Steel Bolts, Hex Cap Screws, and Studs
  .17 ASTM F594-22 Standard Specification for Stainless Steel Nuts
  .18 ASTM F3125/F3125M-23 Standard Specification for High Strength Structural Bolts and Assemblies, Steel and Alloy Steel, Heat Treated, Inch Dimensions 120 ksi and 150 ksi Minimum Tensile Strength, and Metric Dimensions 830 MPa and 1040 MPa Minimum Tensile Strength

.3 CSA Group (CSA)
.1 CSA G40.21-13 General Requirements for Rolled or Welded Structural Quality Steel.
.2 CSA-S16.1-M Limit States Design of Steel Structures.
.3 CSA S136-12 Cold Formed Steel Structural Members.
.4 CSA W47.1-09 (R2014) Certification of Companies for Fusion Welding of Steel Structures.
.5 CSA W59-18 Welded Steel Construction
.6 CSA W178.1-18 Certification of Welding Inspection Organizations
.7 CSA W178.2-18 Certification of Welding Inspectors
.4 Canadian General Standards Board (CGSB)
.1 CAN/CGSB 1.40-97 Anticorrosive Structural Steel Alkyd Primer
.2 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-1975 A Quick drying One-coat Paint for Use on Structural Steel.
.2 CISC/CPMA 2-75-1975 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, 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. Each submission of the shop drawings shall bear the seal of the Engineer.

1.5 Qualifications

.1 Work of this Section shall be executed by a firm thoroughly conversant with laws 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 Design Requirements

.1 Design guardrail and ladder construction and connections to OBC vertical and horizontal live load requirements.

.2 Design service access ladders, stairs and guards to Ministry of Labour requirements.

.3 All access ladders shall be designed to the minimum requirements noted on the drawings and MMAH Supplementary Standard SB-8, whichever is more stringent. This shall include

through-bolting anchors at masonry walls.

1.7 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.

1.8 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 work from damage and deliver to a location at the site in order to meet the scheduling requirements.

.4 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.

1.9 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 G40.20-13/G40.21-13, Grade 350W.

.2 Architectural and Miscellaneous Mild Steel: CSA G40.20-13/G40.21-13, Grade 300W.

.3 High Strength Bolts and Nuts: ASTM F3125. 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 stretcher leveled or temper rolled.

.5 Steel Pipe: ASTM A53 Schedule 40, Grade B.

.6 Welding Materials: CSA W59.

.7 Welding Electrodes: CSA W48 Series.

.8 Composite Metal Deck: As specified in Section 05 31 00.

.9 Sulphur: Commercial Grade for setting of steel posts.

.10 Grout: non-shrink, non-metallic, non-stain, flowable, to ASTM C1107, 15 MPa at 24 hours.

.11 Isolation Coating: Alkali resistant bituminous paint to ASTM D1187.

.12 Adhesive Anchors: HILTI or Rawl Epoxy Adhesive Anchors sized to suit loading conditions, suitable for substrate. Adhesive to be low VOC type (maximum 250 g/l) to SCAQMD Rule 1168-03, Adhesives and Sealants Applications.

2.2 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. Colour to be grey.

.2 Pre Paint Finish: For galvanized surfaces to be exposed and finish painted, to ASTM D6386.

.3 Zinc Rich Primer: zinc rich, organic, ready mix to CAN/CGSB 1.181. Low VOC type.

PART 3 EXECUTION

3.1 Fabrication

.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 Welding shall be done by the shielded metal-arc method in accordance with the requirements CSA W59 and AWS D1.6 for stainless steel. The welding operators shall be currently certified under CSA W47.1 for the work they are performing.

.11 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.

.12 Surfaces to be welded shall be free from loose scale, rust, paint, or other foreign matter. Where weld material is deposited in two 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 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.
- .3 Clean steel which is specified to be painted to CISC/CPMA 2-75 in accordance with that Standard.
- .4 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.
- .5 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.

.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 ° 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 Miscellaneous Framing and Supports

.1 General: Provide steel framing and supports not specified in other Sections as needed to complete the Work.

.2 Fabricate units from steel shapes, plates, and bars of welded construction unless otherwise indicated. Fabricate to sizes, shapes, and profiles indicated and as necessary to receive adjacent construction.
- .1 Furnish inserts for units installed after concrete is placed.

.3 Galvanize miscellaneous framing and supports where indicated.

.4 Prime miscellaneous framing and supports with primer specified in Section 09 91 13 - Exterior Painting or Section 09 91 23 - Interior Painting.

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: CSA 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 Section 04 22 00.

.5 Lintels shall be prime painted unless otherwise indicated.

3.5 Ladders

.1 Conform to Ministry of Labour and Ontario Building Code requirements where applicable.

.2 Unless otherwise detailed, construct ladders as follows:
.1 Stringers shall be minimum 19 x 38 mm steel bar extending from 150 mm above floor or roof, to minimum 1220 mm above top rung.
.2 Rungs shall be 19 mm solid steel bars, 400 mm long, spaced at 300 mm o.c. vertically and welded to stringers.
.3 Attach stringers to walls with 10 mm x 38 mm steel bar yokes, U-shaped, spaced at maximum 1220 mm o.c. vertically. Locate centre line of rungs not less than 150 mm from face of walls.
.4 Where indicated, provide horizontal and vertical returns or stringers.
.5 Interior ladders shall be prime painted. Rungs shall have knurled rungs or non-slip finish.

3.6 Railings

.1 Definition: the term railing shall be taken to mean balustrades, guards, rails and handrails.

.2 Design and fabricate railings to conform to all applicable Ontario Building Code requirements.

.3 Unless otherwise indicated, fabricate railings as follows:
.1 Fabricate handrails and guardrails as detailed.
.2 Pipe rails shall have an outside diameter of not more than 38 mm. Close open ends of tubular members with welded steel plugs.
.3 Extend handrails horizontally at top and bottom of each flight of stairs as shown on the drawings but not less than 305 mm beyond stair nosing at top of stair and 610 mm at bottom of stair.
.4 Turn handrails down at exposed ends or turn into wall as detailed.
.5 Support railings at each end, and at maximum 1070 mm centres unless indicated otherwise or required to meet loading requirements of the Ontario Building Code.
.6 Minimum wall thicknesses of tubular railings: 2.5 mm.
.7 At corners, angles and intersections, cope or mitre railings, weld and grind smooth.
.8 Pickets shall be minimum 13 mm diameter solid steel bars at 100 mm centres.

3.7 Miscellaneous Steel Trim

.1 Unless otherwise indicated, fabricate units from steel shapes, plates, and bars of profiles shown with continuously welded joints and smooth exposed edges. Miter corners and use concealed field splices where possible.

.2 Provide cutouts, fittings, and anchorages as needed to coordinate assembly and installation with other work.
  .1 Provide with integrally welded steel strap anchors for embedding in concrete or masonry construction.

3.8 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 Grind all field welds smooth.

.8 Touch up shop coat of prime paint where damaged by field erection.

.9 Touch up galvanized finishes with zinc rich paint.

3.9 Fasteners and Anchors

.1 Use methods for fastening or anchoring metal fabrications to building construction as shown or specified.

.2 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.

.3 Where fasteners and anchors are not shown, design the type, size, location and spacing to resist the loads imposed without deformation of the members or causing failure of the anchor or fastener,

and suit the sequence of installation.

.4 Use material and finish of the fasteners compatible with the kinds of materials which are fastened together and their location in the finished work.

.5 Fasteners for securing metal fabrications to new construction only, may be by use of threaded or wedge type inserts or by anchors for welding to the metal fabrication for installation before the concrete is placed or as masonry is laid.

.6 Fasteners for securing metal fabrication to existing construction or new construction may be expansion bolts, toggle bolts, power actuated drive pins, welding, self-drilling and tapping screws or bolts.

3.10 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 13 and 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.

3.11 Cleaning

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

.2 Clean exposed prefinished and plated items and items fabricated from stainless steel as recommended by the metal manufacturer and protect from damage until Substantial Performance of the project.

End of Section

PART 1 GENERAL

1.1 General

.1 Conform to the requirements of Division 1.

1.2 Related Sections

.1 Section 08 11 00 Metal Doors and Frames
.2 Section 09 21 16 Gypsum Board
.3 Section 09 22 16 Non-Structural Metal Framing

1.3 References

.1 ASTM International (ASTM)
  .1 ASTM A123/A123M-17 Standard Specification for Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products
  .2 ASTM A653/A653M-23 Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvanealled) by the Hot-Dip Process.
  .3 ASTM F1667-21a Standard Specification for Driven Fasteners: Nails, Spikes, and Staples
.2 CSA Group (CSA)
  .1 CSA A247- M86 (R1996) Insulating Fiberboard.
  .2 CSA G164-18 Hot Dip Galvanizing of Irregularly Shaped Articles.
  .3 CSA O80 SERIES-15 Wood Preservation
  .4 CSA O121-17 Douglas Fir Plywood.
  .5 CSA O141:23 Canadian Standard Lumber.
  .6 CSA O151-17 Canadian Softwood Plywood
  .7 CSA Z809-08 Sustainable Forest Management
.3 Underwriters Laboratories Canada (ULC)
  .1 ULC 102-2018 Standard Method of Test for Surface Burning Characteristics of Building Materials and Assemblies.
.4 National Lumber Grading Authority (NGLA)
  .1 Standard Grading Rules for Canadian Lumber, Latest Edition.
.5 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.

1.4 Submittals

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

.2 Certified Wood: Submit listing of wood products and materials used, produced from wood obtained from forests certified by FSC Accredited Certification Body in accordance with FSC-STD-01-001.

1.5 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.

1.6 Shipping, Handling and Storage

.1 Protect materials, under cover, both in transit and on the site.

.2 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.

.3 Store sheathing materials level and flat, in a dry location. Protect panel edges from moisture at all times.

1.7 Waste Management and Disposal

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

PART 2 PRODUCTS

2.1 Materials

.1 Timber Material shall be 'Grade Stamped'.

.2 CSA Z809 or FSC Certified.

.3 Construction Lumber: To CSA O141 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 Framing lumber, plates, furring, blocking, No. 1 SPF.
.2 Nailing strips, furring and strapping: No. 4 S-P-F.
.3 Fitment framing: No. 1 S-P-F.

.4 Canadian Softwood Plywood: to CSA O151-M, standard construction, good one or both sides as required, thickness as shown or specified.

.5 Douglas Fir Plywood: To CSA O121-M, standard construction, good one side, thickness as shown on the drawings.

.6 Nails, Spikes and Staples: To ASTM F1667.

.7 Sheathing Screws: ASTM C1002, corrosion resistant treated. Length of screws to penetrate framing minimum 13 mm.

.8 Bolts: 12.5 mm diameter, galvanized, complete with nuts and washers.

.9 Proprietary Fasteners: toggle bolts, expansion shields and lag bolts, screws and lead or inorganic fibre plugs, recommended for purpose by manufacturer.

.10 Wood Preservative to CSA O80 SERIES.

.11 Adhesive: Contractors gun grade cartridge loaded wood adhesive, general purpose, to ASTM D2559.

.12 Galvanizing: to CSA-G164. Use galvanized fasteners, and hardware for materials in contact with concrete or masonry.

3.1 Installation

.1 Workmanship

.1 Execute work using skilled mechanics according to best practice, as specified here.
.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: Include rough hardware such as nails, bolts, nuts, washers, screws, clips, and hangers.

.3 Provide treated wood nailers, blocking, cants, grounds, furring and similar members where shown and where required for screeding or attachment of other work and surface applied items. Attach to substrate as required to support applied loading.

.4 Blocking: Provide solid wood backing to support millwork, cabinetwork, equipment, fixtures, railings and accessories and the like, as required. Coordinate with work of other Sections and install all required backing. Any such equipment mounted on gypsum wallboard assemblies or similar assemblies shall be adequately supported.
.1 Provide solid wood blocking in all partitions where wall stops are specified in the hardware schedule.

.5 Drywall Partition Backing:
.1 Install 16 mm D. Fir plywood on metal studs in all reinforced partitions where indicated.
.2 Fasten plywood to metal studs with sheet metal sheathing screws at 12" c/c maximum.

3.1 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 40 00	Architectural Woodwork
.4	Section 07 92 00	Joint Sealants
.5	Section 08 11 00	Metal Doors and Frames
.6	Section 08 14 16	Flush Wood Doors
.7	Section 08 71 10	Door Hardware
.8	Section 09 21 16	Gypsum Board
.9	Section 09 91 23	Interior Painting

1.3 References

.1 ASTM International (ASTM)
  .1 ASTM E1333-22 Standard Test Method for Determining Formaldehyde Concentrations in Air and Emissions Rates from Wood Products Using a Large Chamber.
  .2 ASTM F1667-21a Standard Specification for Driven Fasteners: Nails, Spikes, and Staples
.2 CSA Group (CSA)
  .1 CSA B111-1974 (R2003) Wire Nails, Spikes and Staples.
  .2 CSA G164-18 Hot Dip Galvanizing of Irregularly Shaped Articles.
  .3 CSA O112 SERIES-M1977 (R2006) Standards for Wood Adhesives
  .4 CSA O121-17 Douglas Fir Plywood.
  .5 CSA O141:23 Canadian Standard Lumber.
  .6 CSA O151-17 (R2022) Canadian Softwood Plywood
  .7 CSA O153-13 (R2017) Poplar Plywood.
  .8 CSA Z760-94 (R2001) Life Cycle Assessment
.3 American National Standards Institute (ANSI)
  .1 ANSI A208.1-2009 Particleboard.
  .2 ANSI A208.2-2016 Medium Density Fibreboard (MDF) for Interior Applications.
  .3 ANSI/HPVA HP-1-2016 Standard for Hardwood and Decorative Plywood.
  .4 ANSI/NEMA LD 3-2005 High Pressure Decorative Laminates
.4 Architectural Woodwork Manufacturers Association of Canada (AWMAC) and Architectural Woodwork Institute (AWI)
  .1 Architectural Woodwork Quality Standards Illustrated.
.5 Canadian Plywood Association (CanPly)
  .1 The Plywood Handbook 2005.
.6 Forest Stewardship Council (FSC)
  .1 FSC-STD-01-001-V4-0 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

1.4 Submittals

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

.2 Submit shop drawings.
- .1 Indicate details of construction, profiles, jointing, fastening and other related details.
- .2 Indicate materials, thicknesses, finishes and hardware.

.3 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.

.4 Submit samples of plastic laminate materials.

1.5 Quality Assurance

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

.2 Plywood, particleboard, OSB and wood based composite panels 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 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, standard construction.
- .1 Forestry Stewardship Council (FSC) certified.
- .2 Urea-formaldehyde free.

.2 Canadian Softwood Plywood (CSP): to CSA O151, standard construction.
.1 Forestry Stewardship Council (FSC) certified.
.2 Urea-formaldehyde free.

.3 Particleboard: to ANSI A208.1.
.1 Forestry Stewardship Council (FSC) certified.
.2 Urea-formaldehyde free.

2.3 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 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 ASTM F1667 galvanized.

.3 Wood screws: to CSA B35.4 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 Stage Doors;
.1 Coordinate with Section 08 14 16 - Flush Wood Doors

.2 Fabricate door frames as detailed with solid hardwood.
.3 Prepare frames for hardware.
.4 Set frames plumb , level and secure.

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.

3.4 Door Installation

.1 Install doors in accordance with instructions in Section 08 11 00 and Section 08 14 16 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.

.4 Where indicated on door schedules or drawings, under-cut doors.

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 50 00 Metal Fabrications
.2 Section 06 10 00 Rough Carpentry
.3 Section 06 20 00 Finish Carpentry
.4 Section 07 92 00 Joint Sealants
.5 Section 09 21 16 Gypsum Board
.6 Section 09 91 23 Interior Painting

1.3 References

.1 ASTM International (ASTM)
  .1 ASTM F1667/F1667M-21a Standard Specification for Driven Fasteners: Nails, Spikes, and Staples
.2 Architectural Woodwork Manufacturer's Association of Canada (AWMAC)
  .1 Architectural Woodwork Standards Manual
.3 American National Standards Institute (ANSI)
  .1 ANSI A208.1-2009 Particleboard
  .2 ANSI/NPA A208.2-2009 Medium Density Fibreboard (MDF)
  .3 ANSI/NEMA LD 3-2005 High-Pressure Decorative Laminates (HPDL)
  .4 ANSI/HPVA HP-1-2009 Standard for Hardwood and Decorative Plywood
.4 CSA Group (CSA)
  .1 CSA O112 SERIES-M1977 (R2006) Wood Adhesives
  .2 CSA O121-08 (R2013) Douglas Fir Plywood
  .3 CSA O151-17 (R2022) Canadian Softwood Plywood
  .4 CSA O153:19 Poplar Plywood
  .5 CSA Z809-08 Sustainable Forest Management
.5 Canadian General Services Board (CGSB)
  .1 CAN/CGSB-11.3-M, Hardboard
.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.

1.4 Submittals

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

.2 Submit shop drawings conforming to AWMAC's STANDARDS (NAAWS).
  .1 Show proposed assembly, connections, anchorage, materials, dimensions, thickness, and finishes.
  .2 On casework and countertop elevations show location of backing required for attachment within walls.

.3 Samples:
  .1 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.

.2 Veneer samples minimum 304 mm x 304 mm. Each sample set of three to represent range of colour and grain expected.
.3 Submit full range of manufacturer's standard plastic laminates for selection by the Consultant.
.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.

.2 Woodwork Manufacturer Qualifications:
.1 Minimum 5 years of production experience similar to this project, whose qualifications indicate ability to comply with requirements of this Section.

.3 Preinstallation Conference:
.1 Before framing completed hold a meeting with the contractor, casework manufacturer, casework installer, and framing sub-contractor.
.2 Review locations of backing required for casework installation as shown on casework shop drawings.
.3 Review method of attachment for backing to wall system as shown on architectural drawings.

.4 Mock-up: Prepare mock-ups in accordance with Section 01 45 00 – Quality Control.
.1 Provide mockups of one base cabinet, one wall hung cabinet, and one countertop. Base cabinet to have minimum one drawer. Mockup of material and finish to be provided. Approved mockup may be incorporated in the project.

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 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.

PART 2 PRODUCTS

2.1 Materials

.1 All materials CSA Z809 or FSC Certified.

.2 Solid Wood:
- .1 Unless otherwise indicated, provide AWMAC Custom 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 O141, dressed all sides used in concealed locations.

.3 Veneers: As required by AWMAC's STANDARDS (NAAWS) for its use and Grade specified. Flat sliced maple veneers from architectural grade flitches to provide uniform grain pattern and colour throughout, free of dark streaks and blemishes. Sharp variation of grain patterns and colour between adjacent jointed pieces is not acceptable.

.4 Plywood:
- .1 Veneer core plywood: hardwood with a non-telegraphing grain manufactured with exterior glue. To ANSI/HPVA HP-1-09, minimum five (5) plies.
- .2 Soft Plywood: to CSA O151-M Standard Grade, solid two sides. Use in concealed locations only, except as indicated.
- .3 To ANSI/HPVA HP-1-09, Grade A face, book matched, flat cut maple face and No. 3 edge.

.5 Particleboard: Meeting requirements of AWMAC's STANDARDS (NAAWS). To ANSI A208.1 , minimum density of 720kg/m3 Grade "R".

.6 MDF: Medium Density Fiberboard meeting requirements of AWMAC's STANDARDS (NAAWS).

.7 Edgeband
- .1 For wood veneer casework: Veneer of same species and cut as exposed surfaces.
- .2 For plastic laminate casework: High Pressure Decorative Laminate (HPDL).

.8 Hardboard: To CGSB 11-GP-3M, Type 2, 6 mm thick or as indicated.

.9 Plastic laminate facing sheet: ANSI/NEMA LD 3 High-Pressure Decorative Laminates (HPDL) PF-S and GP-S;

.1 Backing sheet: BK Grade by manufacturer of facing sheet.
.2 Core: CAN3-0188.1M, Grade R.
.3 Laminating adhesive: CAN3-O112 Series M.
.4 Core sealer: clear water resistant synthetic resin sealer.
.5 Colours, pattern, gloss and texture will be selected by Consultant from full range of products by one of the following:
.1 Formica,
.2 Arborite,
.3 Pionite,
.4 Nevamar
.5 Wilsonart.

.10 Melamine Overlaid Panels:
.1 Melamine overlay, heat and pressure laminated with phenolic resin to 12.7 mm thick particle board.
.2 Overlay bonded to both faces where exposed two sides, and when panel material require surface on one side only, reverse side to be overlaid with a plain balancing sheet.
.3 Furniture finish: solid colour as selected by the Consultant.
.4 Edge Finishing: matching melamine and polyester overlay edge strip with self-adhesive.

.11 Fasteners and Adhesive:
.1 Nails and staples: ASTM F1667, galvanized, spiral head nails.
.2 Screws: Zinc, cadmium or chrome plated steel.
.3 Splines: wood or metal, to suit application.
.4 Adhesive: Type 1 waterproof. To CSA O112-M, type as appropriate for the intended application. 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.

.12 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 Draw bolt fasteners: Knape & Vogt KV 516
.2 Shelf Standards: Type optional with manufacturer.
.3 Brackets: Type optional with manufacturer.
.4 Hinges: Blum concealed hinges, 125° clip and 125° opening with self-closing spring. Soft close. Full or half overlay. Nickel plated steel.
.5 Cabinet Pulls: Richelieu D-Pull No: 30134-170, 96 mm c.c. brushed stainless steel.
.6 Cabinet Locks: CCL 0737 pin tumbler MK & KA by room.
.7 Catches: Type optional with manufacturer.
.8 Drawer Slides: Knape & Vogt 8450FM Soft-Close Full-Extension Drawer Slide
.9 Door and Drawer Bumpers: "Quietex" bumpers.
.10 Provide other hardware and hardware accessories as detailed or required.
.11 All exposed hardware to have Platinum (Mica) finish by Teknion or equivalent unless noted otherwise.

2.2 Fabrication

.1 Materials and methods of construction to meet requirements of AWMAC's STANDARDS (NAAWS) for grade or grades specified.
.1 If there is conflict between plans and/or specifications and AWMAC's STANDARDS (NAAWS), plans and specifications shall govern.

.2 Wood Casework: AWMAC Standard Custom Grade.

.3 Construction Type: Frameless

.4 Cabinet and door interface: Flush overlay.

.5 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.

.6 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.

2.3 Wood Casework

.1 Materials and methods of construction to meet requirements of AWMAC's STANDARDS (NAAWS) for grade or grades specified.

.2 If there is conflict between plans and/or specifications and AWMAC's STANDARDS (NAAWS), plans and specifications shall govern.

.3 Wood Casework:
.1 Grade: AWMAC's STANDARDS (NAAWS) Custom Grade

.4 Exposed Surfaces [[species], [cut]], [[book][slip] matched] [material suitable for opaque finish]] meeting requirements of AWMAC's STANDARDS (NAAWS) for Grade specified.

.5 Exposed interior surfaces: Veneer of same species and cut [and grade] as exposed exterior surfaces.

.6 Semi-exposed surfaces: veneer of same species as exposed faces.

2.4 Plastic Laminate Casework

.1 Construct cabinetwork components of plastic laminate faced particle board as indicated and in accordance with AWMAC Custom grade.

.2 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. Unless otherwise permitted by Consultant, use unitized construction system for all components.

.3 Exposed Surfaces: High Pressure Decorative Laminate (HPDL), meeting requirements of AWMAC's Standards (NAAWS) for Grade specified.

.4 Construct door and drawer fronts of 19 mm plastic laminate faced MDF.

.5 Exposed interior surfaces: LPDL of a colour and pattern compatible with exposed surfaces

.6 Semi-exposed surfaces: LPDL

.7 Apply self-edged minimum 1.0 mm thick plastic laminate to exposed ends of countertops.

.8 Rout gables for pilaster strips where adjustable shelving is required.

.9 Construct shelving with edge moulding to match. Shelving to cabinetwork to be adjustable unless otherwise noted.

.10 Apply moisture repellent sealer to concealed backs of cabinetwork.

.11 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.

.12 Install rubber wiring grommets at work surfaces where indicated.

.13 Coordinate installation of wiring for electrical work with Electrical.

2.5 Drawers

.1 Sides: Particle board with melamine surfaces.

.2 Bottoms: MDF or hardboard with melamine surfaces

.3 Joinery: Meeting requirements of AWMAC's STANDARDS (NAAWS) for Grade specified.

2.6 Laminated Plastic Countertops

.1 Core material: exterior grade hardwood plywood with a non-telegraphing grain.

.2 Use largest practicable plastic laminate sheet size.

.3 Back splashes: as indicated, 100 mm high.

.4 Front edges: As indicated

.5 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.

2.7 Finishes

.1 All exposed interior surfaces: melamine unless indicated otherwise.

.2 Cabinet and case backs unexposed to view shall be back primed with one coat of moisture repellent sealer.

.3 Apply finishes in accordance with the AWMAC Manual.

2.8 Factory Finishing

.1 Grade: AWMAC's STANDARDS (NAAWS) Premium Grade.

.2 Wood Finish: 3 coats clear polyurethane finish on all sides.

PART 3 EXECUTION

3.1 Examination

.1 Verify mechanical, electrical, plumbing, HVAC and other building components, affecting work in this Section are in place and ready.

.2 Verify HVAC controls and systems are operating properly.

.3 Verify adequacy of backing and support framing. Advise Contractor of areas and surfaces requiring further modifications for plumb, level, even or square fitting.

3.2 Installation

.1 Install work in accordance with AWMAC Installation Manual, Custom grade.

.2 Secure all work in place, square, plumb, and level.

.3 Accurately scribe and closely fit components to irregularities of adjacent surfaces.

.4 Accurately fit joints in true plane, locate joints over bearing or supporting surfaces.

.5 Countersink mechanical fasteners used at exposed and semi-exposed surfaces, excluding installation attachment screws and those securing cabinets end to end.

.6 Where permitted, nail with small headed finishing nails. Countersink nail heads with nail setter.

.7 Install plastic laminate components using concealed fastening devices.

.8 Where components are fastened with screws or bolts, countersink screw and bolt heads and provide wood plugs matching surrounding wood.

.9 Where cabinetwork abuts other building elements, provide wood trim matching cabinetwork except where otherwise detailed.

.3 Cut equipment cutouts shown on plans using templates provided.
  .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.

.10 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.

.11 Apply mildew resistant silicone sealant to perimeter of all countertops as specified in Section 07 92 00.

3.3 Adjustment

.1 Adjust all moving and operating parts to function smoothly and correctly.

.2 Fill and retouch all nicks, chips and scratches. Replace all un-repairable damaged items.

.3 Replace damaged components which, in the opinion of the Consultant, cannot be satisfactorily repaired.

3.4 Cleaning

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

.2 Upon completion of installation, clean installed items of pencil and ink marks and broom clean the area of operation.

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 09 65 66 Indoor Athletic Surfacing
.3 Section 09 65 70 Resilient Sheet Flooring

1.3 References

.1 ASTM International (ASTM)
  .1 ASTM C78/C78M-22 Standard Test Method for Flexural Strength of Concrete (Using Simple Beam with Third-Point Loading)
  .2 ASTM C109/C109M-21 Standard Test Method for Compressive Strength of Hydraulic Cement Mortars (Using 2-in. or [50-mm] Cube Specimens)
  .3 ASTM C1583/C1583M-20 Standard Test Method for Tensile Strength of Concrete Surfaces and the Bond Strength or Tensile Strength of Concrete Repair and Overlay Materials by Direct Tension (Pull-off Method)
  .4 ASTM D1308-20 Standard Test Method for Effect of Household Chemicals on Clear and Pigmented Coating Systems
  .5 ASTM E96/E96M-22ae1 Standard Test Methods for Water Vapor Transmission of Materials
  .6 ASTM F710-22 Standard Practice for Preparing Concrete Floors to Receive Resilient Flooring
  .7 ASTM F2170-19a Standard Test Method for Determining Relative Humidity in Concrete Floor Slabs Using in situ Probes

1.4 Submittals

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

.2 Test Results: submit moisture vapour emission test data.

.3 Product Data: Submit manufacturer's product data and installation instructions for each material and product used.

1.5 Quality Assurance

.1 Installation of the products must be completed by a manufacturer's certified applicator.

.2 Manufacturer Experience: Provide products of this section by companies which have successfully specialized in production of this type of work for not less than 5 years.

1.6 Project Conditions

.1 Do not install material below 10 °C surface and air temperatures. These temperatures must also be maintained during and for 48 hours after the installation of products included in this section.

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 Deliver products in original packaging, labeled with product identification, manufacturer, batch number and shelf life.

.4 Store products in a dry area with temperature maintained between 10 ° and 29 °C and protect from direct sunlight.

.5 Handle products in accordance with manufacturers printed recommendations.

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 Topical Moisture Mitigation System

.1 Two-Coat Moisture Control System for Concrete:
  .1 Acceptable Products: ARDEX MC PLUS; Manufactured by ARDEX Engineered Cements: 400 Ardex Park Drive, Aliquippa, Pa 15001 USA 724-203-5000

.2 Performance and Physical Properties: Meet or exceed the following values for material cured at 21° C+/-3°C and 50% +/-5% relative humidity:
  .1 Application: Roller
  .2 Permeability: 0.12 perms (<.10 perms with sand in 2nd Coat), ASTM E96
  .3 14 pH solution: No effect, ASTM D1308
  .4 VOC: 0g/l, calculated SCAQMD 1168

2.2 Hydraulic Cement Underlayment

.1 Hydraulic Cement-based Self-Leveling Underlayment
  .1 Acceptable Products:
    .1 ARDEX K 15; Manufactured by ARDEX Engineered Cements: 400 Ardex Park Drive, Aliquippa, Pa 15001 USA, (724) 203-5000, www.ardex.com
      .1 Primer: No additional primer required
    .2 ARDEX K 55, Manufactured by ARDEX Engineered Cements: 400 Ardex Park Drive, Aliquippa, Pa 15001 USA, (724) 203-5000, www.ardex.com
      .1 Primer: No additional primer required

.2 Performance and Physical Properties: Meet or exceed the following values for material cured at 21° C+/-3°C and 50% +/-5% relative humidity:
  .1 Application: Barrel Mix or Pump

.2 Flow Time: 10 minutes
.3 Initial Set: Approx. 30 minutes
.4 Final Set: Approx. 90 minutes
.5 Compressive Strength: Minimum 4100 psi at 28 days, ASTM C109M.
.6 Flexural Strength: 1000 psi at 28 days, ASTM C78.
.7 VOC: 0 g/l, calculated SCAQMD 1168

2.3 Water

.1 Water shall be clean, potable, and sufficiently cool (not warmer than 20 °C).

PART 3 EXECUTION

3.1 Preparation

.1 Concrete Subfloors: Prepare substrate in accordance with manufacturer's instructions and ASTM F710. All concrete subfloors must be sound, solid, clean, and free of all oil, grease, dirt, curing compounds and any substance that might act as a bond breaker before application.
  .1 Mechanical preparation of the surface is required to obtain a minimum ICRI concrete surface profile of 3 (CSP 3). This substrate preparation must be by mechanical means, such as shot blasting.
  .2 The concrete must have a minimum tensile strength of at least 200 psi when tested in accordance with ASTM C1583. The concrete surface must be free of standing water.
  .3 Prior to beginning the installation, measure the relative humidity within the concrete (ASTM F2170). Alternatively, measure the surface relative humidity in accordance with ASTM F2420. For these relative humidity methods, the RH shall not exceed 100%.
  .4 If the concrete substrate is too uneven to provide a uniform film thickness of the moisture control system (typically CSP 6 or higher), the substrate shall be pre-smoothed using self-leveling exterior concrete topping or moisture resistant patch.

.2 Joint Preparation
  .1 Moving Joints: honour all expansion and isolation joints up through the moisture mitigation system and underlayment.
  .2 Saw Cuts and Control Joints – fill all non-moving joints with joint filler as recommended by the manufacturer.

3.2 Application

.1 Examine substrates and conditions under which materials will be installed. Do not proceed with installation until unsatisfactory conditions are corrected.

.2 Coordinate installation with adjacent work to ensure proper sequence of construction. Protect adjacent areas from contact due to mixing and handling of materials.

.3 Mix and apply primer and sealer in accordance with manufacturer's written instructions.

3.3 Field Quality Control

.1 Where specified, field sampling is to be done by taking an entire unopened bag/unit of the product being installed to an independent testing facility to perform testing. There is no in-situ test method applicable for this system.

3.4 Cleaning

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

3.5 Protection

.1 Prior to the installation of the finish flooring, the surface of the underlayment shall be protected from abuse by other trades by the use of plywood, Masonite or other suitable protection course.

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 E84-23d Standard Test Method for Surface Burning Characteristics of Building Materials
  .2 ASTM E119-20 Standard Test Methods for Fire Tests of Building Construction and Materials
  .3 ASTM E136-19a Standard Test Method for Behavior of Material in a Vertical Tube Furnace at 750° C
  .4 ASTM E814-13a (2017) Standard Test Method for Fire Tests of Penetration Firestop Systems
  .5 ASTM E1966-15(2019) Standard Test Method for Fire-Resistive Joint Systems
  .6 ASTM E2307-20 Standard Test Method for Determining Fire Resistance of Perimeter Fire Barriers Using Intermediate-Scale, Multi-story Test Apparatus
.2 Underwriter's Laboratories of Canada (ULC)
  .1 ULC 101-2014 Standard Methods of Fire Endurance Tests of Building Construction and Materials
  .2 ULC 102.2-2018 Method of Test for Surface Burning Characteristics of Flooring, Floor Coverings, and Miscellaneous Materials and Assemblies
  .3 ULC 115-2018 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: Submit manufacturer's printed product literature, specifications and datasheet and include product characteristics, performance criteria, physical size, finish and limitations.

.3 Shop Drawings: Submit shop drawings to show location, proposed material, reinforcement, anchorage, fastenings and method of installation. 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 ULC 101 for fire endurance and ULC 102 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:

.1 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 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 Project Conditions

.1 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.

.2 Ventilation: Ventilate fire-stopping per fire-stopping manufacturers' instructions by natural means or, where this is inadequate, forced air circulation.

1.9 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.

1.10 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 Applications: Provide fire-stopping systems composed of materials specified in this Section that comply with system performance and other requirements.

.3 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.

.4 All firestopping material shall be:
.1 From one manufacturer;
.2 Intumescent where an appropriate system exists.

.5 Fire stopping and smoke seal systems: ULC listed in accordance with ULC 115.
  .1 Asbestos-free materials and systems capable of maintaining effective barrier against flame, smoke and gases in compliance with requirements of ULC 115 and not to exceed opening sizes for which they are intended.

.6 Service penetration assemblies: ULC listed systems tested to ULC 115.

.7 Service penetration fire stop components: ULC listed and certified by test laboratory to ULC 115.

.8 Fire-resistance rating of installed fire stopping assembly in accordance with NBC.

.9 Fire stopping and smoke seals at openings intended for ease of re-entry such as cables: elastomeric seal.

.10 Fire stopping and smoke seals at openings around penetrations for pipes, ductwork and other mechanical items requiring sound and vibration control: elastomeric seal.

.11 Primers: to manufacturer's recommendation for specific material, substrate, and end use.

.12 Water: potable, clean and free from injurious amounts of deleterious substances.

.13 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.

.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. Sealants for vertical joints: non-sagging.

.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.

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 Article 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 Article 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 partitions and walls.
- .2 Perimeter 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 cm^2: 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 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 06 10 00 Rough Carpentry
.2 Section 08 11 00 Metal Doors and Fames

1.3 References

.1 ASTM International (ASTM)
  .1 ASTM C719-22 Standard Test Method for Adhesion and Cohesion of Elastomeric Joint Sealants Under Cyclic Movement (Hockman Cycle)
  .2 ASTM C794-18(2022) Standard Test Method for Adhesion-in-Peel of Elastomeric Joint Sealants
  .3 ASTM C834-17 Standard Specification for Latex Sealants
  .4 ASTM C919-22 Standard Practice for Use of Sealants in Acoustical Applications
  .5 ASTM C920-18 Standard Specification for Elastomeric Joint Sealants
  .6 ASTM C1193-16 Standard Guide for Use of Joint Sealants
  .7 ASTM C1330-23 Standard Specification for Cylindrical Sealant Backing for Use with Cold Liquid-Applied Sealants.
  .8 ASTM D412-16(2021) Standard Test Methods for Vulcanized Rubber and Thermoplastic Elastomers—Tension
  .9 ASTM E84-23c Standard Test Method for Surface Burning Characteristics of Building Materials
  .10 ASTM E90-09(2016) Standard Test Method for Laboratory Measurement of Airborne Sound Transmission Loss of Building Partitions and Elements
.2 Department of Justice Canada (Jus)
  .1 Canadian Environmental Protection Act, 1999 (CEPA).
.3 U. S. Environmental Protection Agency (EPA)
  .1 EPA 40 CFR 59, Subpart D - National Volatile Organic Compound Emission Standards for Architectural Coatings.
.4 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 including:
  .1 Preparation instructions and recommendations.
  .2 Standard drawings illustrating manufacturer's recommended sealant joint profiles and dimensions applicable to Project.

.3 Joint Sealant Schedule: Indicate joint sealant location, joint sealant type, manufacturer and product name, and colour, for each application. Utilize joint sealant designations included in this Section.

.4 Samples:
  .1 Samples for Colour Selection: For each joint sealant type.
  .2 Samples for Verification: For each joint sealant product, for each colour selected.

.5 Greenguard Certificates: For each sealant and accessory product specified to meet volatile organic

emissions standards of the Greenguard Children and Schools Certification.

1.5 Quality Assurance

.1 Installer Qualifications: Company with minimum of three years of experience specializing in work of this section, employing applicators trained for application of joint sealants required for this project, with record of successful completion of projects of similar scope, and approved by manufacturer.

.2 Single Source Responsibility: Provide joint sealants by a single manufacturer responsible for testing of Project substrates to verify compatibility and adhesion of joint sealants.

.3 Caulking work shall be carried out in strict accordance with manufacturer's printed directions.

.4 Preconstruction Manufacturer Laboratory Compatibility, Staining, and Adhesion Testing: Submit samples of each substrate or adjacent material that will be in contact with or affect joint sealants. Current manufacturer test data of products on matching substrates will be acceptable.

.5 Adhesion: Use ASTM C719 and ASTM C794 to determine requirements for joint preparation, including cleaning and priming.

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 Project Conditions

.1 Conform to manufacturer's recommended temperatures, relative humidity, and substrate moisture content for application and curing of sealants including special conditions governing use.

.2 Ventilate area of work by use of approved portable supply and exhaust fans.

1.8 Scheduling

.1 Ensure sealants are cured before covering with other materials.

1.9 Waste Management and Disposal

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

PART 2 PRODUCTS

2.1 Manufacturer

.1 Basis-of-Design Products: Provide joint sealant products manufactured by Tremco, Inc., Commercial Sealants and Waterproofing, 220 Wicksteed Avenue, Toronto, www.tremcosealants.com, or comparable products of other manufacturer approved by Consultant.

2.2 Materials, General

.1 VOC Content for Interior Applications: Provide sealants and sealant primers complying with the following VOC content limits per 40 CFR 59, Subpart D (EPA Method 24):
  .1 Architectural Sealants: 250 g/L.
  .2 Sealant Primers for Nonporous Substrates: 250 g/L.

.3 Sealant Primers for Porous Substrates: 775 g/L.

.2 Low-Emitting Sealants for Interior Applications: Provide sealants and sealant primers complying with the testing and product requirements of the California Department of Health Services' "Standard Practice for the Testing of Volatile Organic Emissions from Various Sources Using Small-Scale Environmental Chambers."

.3 Compatibility: Provide joint sealants and accessory materials that are compatible with one another, and with adjacent materials, as demonstrated by sealant manufacturer

.4 Joint Sealant Standard: Comply with ASTM C920 and other specified requirements for each joint sealant.

2.3 Silicone Joint Sealants

.1 SJS#1: Mildew-Resistant, Single-Component, Acid-Curing Silicone Joint Sealant: ASTM C920, Type S, Grade NS, Class 25, Use NT.
.1 Basis of Design Product: Tremco Tremsil 200 Sanitary.
.2 Volatile Organic Compound (VOC) Content: 1 g/L maximum.
.3 Volatile Organic Emissions (VOE): Not greater than Greenguard Children & Schools Certification emissions levels.
.4 Colour: White and Clear.

2.4 Urethane Joint Sealants

.1 UJS#1: Single-Component, Nonsag, Moisture-Cure, Polyurethane Joint Sealant: ASTM C920, Type S, Grade NS, Class 50, Use NT; Greenguard certified.
.1 Basis of Design Product: Tremco Dymonic 100.
.2 Volatile Organic Compound (VOC) Content: 40 g/L maximum.
.3 Volatile Organic Emissions (VOE): Not greater than Greenguard Children & Schools Certification emissions levels.
.4 Tensile Strength ASTM D412: 350 to 450 psi
.5 Percent Elongation ASTM D412: 800 to 900%
.6 Modulus at 100% ASTM D412: 75 to 85 psi
.7 Tear Strength ASTM D412: 65 to 75 psi
.8 Smoke Development ASTM E84: 5
.9 Colour: As selected by Consultant from manufacturer's standard line.

.2 UJS#2: Immersible, Single-Component, Pourable, Traffic Grade Polyurethane Joint Sealant: ASTM C920, Type S, Grade P, Class 50, Use T and I.
.1 Basis of Design Product: Tremco Vulkem 45 SSL.
.2 Volatile Organic Compound (VOC) Content: 110 g/L maximum.
.3 Volatile Organic Emissions (VOE): Not greater than Greenguard Children & Schools Certification emissions levels.
.4 Colour: As selected by Consultant from manufacturer's standard line.

2.5 Latex Joint Sealants

.1 LJS#1: Latex Joint Sealant: Siliconized acrylic latex, ASTM C834, Type OP, Grade NF.
.1 Basis of Design Product: Tremco Tremflex 834.
.2 Volatile Organic Compound (VOC) Content: 35 g/L maximum.
.3 Volatile Organic Emissions (VOE): Not greater than Greenguard Children & Schools Certification emissions levels.
.4 Colour: White, paintable.

2.6 Acoustical Sealants

.1 AJS#1: Acoustical/Curtainwall Sealant: Single-component, non-hardening, non-sag, paintable synthetic rubber-tested to reduce airborne sound transmission through perimeter joints and openings in building construction as demonstrated by testing of similar assemblies according to ASTM E90.
.1 Basis of Design Product: Tremco Acoustical/Curtainwall Sealant.
.2 Volatile Organic Compound (VOC) Content: 160 g/L maximum.
.3 Colour: White, paintable.

2.7 Joint Sealant Accessories

.1 Cylindrical Sealant Backing: ASTM C1330, Type B non-absorbent, bi-cellular material with surface skin, or Type O open-cell polyurethane, as recommended by sealant manufacturer for application.

.2 Bond Breaker Tape: Polymer tape compatible with joint sealant and adjacent materials and recommended by sealant manufacturer.

.3 Joint Substrate Primers: Substrate primer recommended by sealant manufacturer for application.

.4 Cleaners: Chemical cleaners acceptable to joint sealant manufacturer.

.5 Masking tape: Non-staining, non-absorbent tape product compatible with joint sealants and adjacent joint surfaces.

PART 3 EXECUTION

3.1 Examination

.1 Examine joint profiles and surfaces to determine if work is ready to receive joint sealants. Verify joint dimensions are adequate for development of sealant movement capability. Verify joint surfaces are clean, dry, and adequately cured. Proceed with joint sealant work once conditions meet sealant manufacturer's written recommendations.

3.2 Preparation

.1 Joint Surface Cleaning: Clean joints prior to installing joint sealants using materials and methods recommended by sealant manufacturer. Comply with ASTM C1193.
.1 Remove curing compounds, laitance, form-release agents, dust, and other contaminants.
.2 Clean nonporous and porous surfaces utilizing chemical cleaners acceptable to sealant manufacturer.
.3 Protect elements surrounding the Work of this section from damage or disfiguration. Apply masking tape to adjacent surfaces when required to prevent damage to finishes from sealant installation.

3.3 Application

.1 Sealant and Primer Installation Standard: Comply with ASTM C1193 and manufacturer's written instructions.

.2 Joint Backing: Select joint backing materials recommended by sealant manufacturer as compatible with sealant and adjacent materials. Install backing material at depth required to produce profile of joint sealant allowing optimal sealant movement.
.1 Install joint backing to maintain the following joint ratios:

.1 Joints up to 13 mm wide: 1:1 width to depth ratio.
.2 Joints greater than 13 mm wide: 2:1 width to depth ratio; maximum 13 mm joint depth.

.2 Install bond breaker tape over substrates when sealant backings are not used.

.3 Masking: Mask adjacent surfaces to prevent staining or damage by contact with sealant or primer.

.4 Joint Priming: Prime joint substrates when recommended by sealant manufacturer or when indicated by preconstruction testing or experience. Apply recommended primer using sealant manufacturer's recommended application techniques.

.5 Liquid Sealant Application: Install sealants using methods recommended by sealant manufacturer, in depths recommended for application. Apply in continuous operation from bottom to top of joint vertically and horizontally in a single direction. Apply using adequate pressure to fill and seal joint width.
.1 Tool sealants immediately with appropriately shaped tool to force sealants against joint backing and joint substrates, eliminating voids and ensuring full contact.
.2 Install sealant free of air pockets, foreign embedded matter, ridges, and sags.
.3 Tool exposed joint surface concave using tooling agents approved by sealant manufacturer for application.

.6 Cleaning: Remove excess sealant using materials and methods approved by sealant manufacturer that will not damage joint substrate materials.
.1 Remove masking tape immediately after tooling joint without disturbing seal.
.2 Remove excess sealant from surfaces while still uncured.

.7 Installation of Acoustical Sealant: At sound-rated assemblies and elsewhere as indicated, seal construction at perimeters, behind control joints, and at openings and penetrations on both sides of assemblies with a continuous bead of acoustical sealant. Comply with ASTM C919 and with manufacturer's written recommendations.

3.4 Field Quality Control

.1 Field-Adhesion Testing: Perform adhesion tests in accordance with manufacturer's instructions and with ASTM C1193, Method A.
.1 Perform 5 tests for the first 300 m of joint length for each kind of sealant and joint substrate, and one test for each 300 m of joint length thereafter or 1 test per each floor per building elevation, minimum.
.2 For sealant applied between dissimilar materials, test both sides of joint.

.2 Remove sealants failing adhesion test, clean substrates, reapply sealants, and re-test. Test adjacent sealants to failed sealants.

.3 Submit report of field adhesion testing to Consultant indicating tests, locations, dates, results, and remedial actions taken.

3.5 Interior Joint Sealant Schedule

.1 Interior vertical movement joints in interior concrete and unit masonry.
.1 UJS#1: Single-component non-sag urethane sealant.

.2 Interior movement joints in interior unit masonry.
.1 UJS#1: Single-component non-sag urethane sealant.

.3 Interior perimeter joints of interior frames.
.1 LJS#1: Siliconized acrylic latex

.4 Interior sanitary joints between plumbing fixtures and adjacent walls and floors.
.1 SJS#1: Mildew-Resistant, Single-Component, nonsag, acid-curing silicone joint sealant.

.5 Interior traffic joints in floor and between floor and wall construction.
.1 UJS# 2: Single-component pourable urethane sealant.

.6 Interior non-moving joints between interior painted surfaces and adjacent materials.
.1 LJS#1: Siliconized acrylic latex
.2 Joint-Sealant Colour: Paintable.

.7 Interior exposed and non-exposed acoustical applications.
.1 AJS#1: Acoustical joint sealant.

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 10 00 Rough Carpentry
.2 Section 07 92 00 Joint Sealants
.3 Section 08 71 10 Door Hardware
.4 Section 09 21 16 Gypsum Board
.5 Section 09 22 16 Non-Structural Metal Framing
.6 Section 09 91 23 Interior Painting

1.3 References

.1 ASTM International (ASTM)
  .1 ASTM A653/A653M-23 Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process
  .2 ASTM C177-19e1 Standard Test Method for Steady-State Heat Flux Measurements and Thermal Transmission Properties by Means of the Guarded-Hot-Plate Apparatus
  .3 ASTM C518-21 Standard Test Method for Steady-State Thermal Transmission Properties by Means of the Heat Flow Meter Apparatus
  .4 ASTM C591-22 Standard Specification for Unfaced Preformed Rigid Cellular Polyisocyanurate Thermal Insulation
  .5 ASTM C1289-22a Standard Specification for Faced Rigid Cellular Polyisocyanurate Thermal Insulation Board
  .6 ASTM D6386-22 Standard Practice for Preparation of Zinc (Hot-Dip Galvanized) Coated Iron and Steel Product and Hardware Surfaces for Painting
  .7 ASTM D7396-14(2020) Standard Guide for Preparation of New, Continuous Zinc-Coated (Galvanized) Steel Surfaces for Painting
  .8 ASTM E90-09(2016) Standard Test Method for Laboratory Measurement of Airborne Sound Transmission Loss of Building Partitions and Elements.
  .9 ASTM E330/E330M-14(2021) Standard Test Method for Structural Performance of Exterior Windows, Doors, Skylights and Curtain Walls by Uniform Static Air Pressure Difference.
.2 Canadian General Standards Board (CGSB)
  .1 CAN/CGSB-1.181-99 Ready-Mixed Organic Zinc-Rich Coating.
.3 CSA Group (CSA)
  .1 CSA-G40.20-13/G40.21-13 General Requirements for Rolled or Welded Structural Quality Steel/Structural Quality Steel.
  .2 CSA W59-18 Welded Steel Construction (Metal Arc Welding).
.4 Canadian Steel Door Manufacturers' Association (CSDMA)
  .1 CSDMA Recommended Dimensional Standards for Commercial Steel Doors and Frames, 2000
  .2 CSDMA Recommended Specifications for Commercial Steel Doors and Frames, 2006.
  .3 CSDMA Selection and Usage Guide for Commercial Steel Door and Frame Products, 2009.
.5 American National Standards Institute (ANSI)
  .1 ANSI 250.4-2018 Test Procedure and Acceptance Criteria for — Physical Endurance for Steel Doors, Frames and Frame Anchors
  .2 ANSI 250.10-2011 Test Procedure and Acceptance Criteria for Prime Painted Steel Surfaces for Steel Doors and Frames

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, frame, steel, construction and core.
.2 Indicate material thicknesses, mortises, reinforcements, anchorages, location of exposed fasteners, openings, arrangement of hardware, and finishes.
.3 Include schedule identifying each unit, with door marks and numbers relating to numbering on drawings and door schedule.

1.5 System Description

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

1.6 Defining Opening Sizes

.1 Width - Widths of openings shall be measured from inside to inside of frame jamb rabbets. (Referred to as "frame rabbet width" or "nominal door width")

.2 Height - Heights of openings shall be measured from the finished floor (exclusive of floor coverings) to the head rabbet of the frame. (Referred to as "frame rabbet height" or "nominal door height")

.3 Door Sizes - Doors shall be sized so as to fit the above openings and allow a 3 mm nominal clearance at jambs and head of frame. A clearance of 13 mm maximum shall be allowed between the bottom of the door and the finished floor (exclusive of floor coverings).

.4 Tolerances - Doors and frame product shall be manufactured and installed in accordance with the CSDMA's, "Recommended Dimensional Standards for Commercial Steel Doors and Frames".

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 Procedures/Factory Inspection Manuals issued by listing agency to individual manufacturers.

1.8 Testing and Performance

.1 Product quality shall meet the standards established by the Canadian Steel Door Manufacturer's Association.

.2 Door construction shall meet acceptance criteria of ANSI A250.10 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.

1.9 Waste Management and Disposal

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

PART 2 PRODUCTS

2.1 Materials

.1 Acceptable Materials
.1 Steel doors and frame product manufactured in accordance with this Specification by CSDMA members, are eligible for use on this project.

.2 Steel: Commercial grade steel to ASTM A653, CS, Type B, Coating Designation ZF75 (A25) minimum. Minimum steel thicknesses shall be in accordance with Appendix 1 of the CSDMA, Recommended Specifications for Commercial Steel Door and Frame Products unless noted otherwise.

.3 Reinforcement channel: to CSA G40.20/G40.21, Type 44W, coating designation to ASTM A653, ZF75.

.4 Door Core Materials
.1 Interior Doors: 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.

.5 Primers:
.1 Touch-up prime CAN/CGSB-1.181, organic zinc rich, rust inhibitive.
.1 Maximum VOC limit 50 g/L to GC-03.

2.2 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.

.3 Polyisocyanurate: heat resistant, epoxy resin based, low viscosity, contact cement.

.4 Lock-seam doors: fire resistant, resin reinforced polychloroprene, high viscosity, low VOC sealant/adhesive or U.L.C. approved equivalent.

2.3 Accessories

.1 Door silencers: single stud rubber/neoprene type.

.2 Metallic paste filler: to manufacturer's standard.

.3 Sealant: As specified in Section 07 92 00.

2.4 Fabrication - Frame Products

.1 General
.1 Fabricate frames in accordance with CSDMA specifications.
.2 Fabricate frames to profiles and maximum face sizes as indicated.
.3 Exterior frame product shall be 1.60 mm welded type construction, thermally broken.
.4 Interior frame product shall be 1.60 mm. Interior frames, transoms, sidelights and window assemblies shall be welded type construction.

.5 Blank, reinforce, drill and tap frames for templated hardware and electronic hardware using templates provided by finish hardware supplier. Reinforce frames for surface mounted hardware.
.6 Prepare frames to receive electrical conduit for door operators where indicated and required.
.7 Protect mortised cutouts with steel guard boxes.
.8 Provide anchorage appropriate to floor, wall and frame construction. Each wall anchor shall be located immediately above or below each hinge reinforcement on the hinge jamb and directly opposite on the strike jamb. For rebate opening heights up to and including 1520 mm provide two (2) anchors, and an additional anchor for each additional 760 mm of height or fraction thereof, except as indicated below. Frames in previously placed concrete, masonry or structural steel shall be provided with anchors located not more than 150 mm from the top and bottom of each jamb, and intermediate anchors at 660 mm on centre maximum. Fasteners for such anchors shall be provided by others.
.9 Minimum reinforcing, anchor and other component thickness shall be in accordance with Table 1 of the CSDMA, "Recommended Specifications for Commercial Steel Door and Frame Products".
.10 Each interior door opening shall be prepared for single stud rubber door silencers, three (3) for single door openings, two for double door openings, except on gasketed frame product.
.11 Provide factory-applied touch up primer at areas where zinc coating has been removed during fabrication.

.2 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 Cope accurately and securely weld butt joints of mullions, centre rails and sills.
.4 Grind welded joints and corners to a flat plane, fill with metallic paste and sand to uniform smooth finish.
.5 Where frame product is to be installed prior to the adjacent partition, a floor anchor shall be securely attached to the inside of each jamb profile. Each floor anchor shall be provided with two holes for securing to the floor. For conditions that do not permit the use of a floor anchor, an additional wall anchor, located within 150 mm of the base of the jamb, shall be substituted.
.6 Weld in two temporary jamb spreaders per door opening to maintain proper alignment during shipment and handling, which shall not be used for installation.
.7 Glazing stops shall be formed steel channel, minimum 16 mm height, accurately fitted, butted at corners and fastened to frame sections with counter-sunk oval head sheet metal screws.
.8 When required due to site access, when advised by the contractor responsible for coordination or installation, as specified on the drawings or due to shipping limitations, frame product for large openings shall be fabricated in sections as designated on the approved submittal drawings, with splice joints for field assembly and welding by others.
.9 Prior to shipment, mark each frame product with an identification number as shown on the approved submittal drawings.
.10 Provide factory-applied touch up primer at areas where zinc coating has been removed during fabrication.
.11 Manufacturer's nameplates on frames and screens are not permitted

2.5 Fabrication - Doors

.1 General
.1 Interior doors: insulated steel construction with honeycomb core laminated to minimum 1.19 mm nominal thickness steel face sheets under pressure.
.2 Voids between vertical stiffeners shall be filled with fiberglass batt type insulation.
.3 Doors: swing type, flush.

.4 Doors: manufacturers' proprietary construction, tested and/or engineered as part of a fully operable assembly, including door, frame, gasketing and hardware in accordance with ASTM E330.

.2 Longitudinal edges shall be mechanically inter-locked, adhesive assisted. Seams: visible grind welded joints to a flat plane, fill with metallic paste filler and sand to a uniform smooth finish.

.3 Doors shall be mortised, blanked, reinforced, drilled and tapped at the factory for templated hardware and electronic hardware, in accordance with the approved hardware schedule and templates provided by the hardware supplier.

.4 Holes 12.7 mm diameter and larger shall be factory prepared, except mounting and through-bolt holes, which are by others, on site, at time of hardware installation. Holes less than 12.7 mm diameter shall be factory prepared only when required for the function of the device (for knob, lever, cylinder, thumb or turn pieces) or when these holes over-lap function holes.

.5 Doors shall be reinforced where required, for surface mounted hardware, anchor hinges, thrust pivots, pivot reinforced hinges, or non-templated hardware.

.6 Provide top and bottom of doors with inverted, recessed, welded steel channels. Exterior doors shall be provided with rigid PVC top caps.

.7 Minimum reinforcing and component thickness shall be in accordance with Table 1 of the CSDMA, "Recommended Specifications for Commercial Steel Door and Frame Products".

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

.9 Prior to shipment, mark each door with an identification number as shown on the approved submittal drawings.

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

2.6 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.

2.7 Finishes

.1 Doors and frames shall wipe coat zinc, ready for painting.

PART 3 EXECUTION

3.1 Manufacturer's Instructions

.1 Comply with manufacturer's written recommendations or specifications, including product technical bulletins, handling, storage and installation instructions, and data sheets.

3.2 Installation

.1 Install doors and frames to CSDMA Installation Guide, NAAMM-HMMA 840, Installation Guide for Commercial Steel Doors and Frames.

.2 Install doors and hardware in accordance with hardware templates and manufacturer's instructions and Section 08 71 10 - Door Hardware. Coordinate with Section 08 71 10 for preparation and installation of automatic door operators.

.3 Adjust operable parts for correct clearances and function.

.4 Install door silencers.

.5 Provide even margins between doors and jambs and doors and finished floor and thresholds as follows:
- .1 Hinge side: 1.0 mm.
- .2 Latch side and head: 1.5 mm.
- .3 Finished floor and thresholds: 13 mm.

.6 Caulk perimeter of frames. Refer to Section 07 92 00 – Joint Sealants.

3.3 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.

3.4 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/ICC A117.1-2017 Accessible and Usable Buildings and Facilities
  .3 ANSI/BHMA A156.1-2013 American National Standard for Butts and Hinges.
  .4 ANSI/BHMA A156.2-2011 Bored and Preassembled Locks and Latches.
  .5 ANSI/BHMA A156.4-2013 Door Controls - Closers.
  .6 ANSI/BHMA A156.5-2014 Auxiliary Locks and Associated Products.
  .7 ANSI/BHMA A156.6-2010 Architectural Door Trim.
  .8 ANSI/BHMA A156.8-2010 Door Controls - Overhead Stops and Holders.
  .9 ANSI/BHMA A156.10-2011 Power Operated Pedestrian Doors.
  .10 ANSI/BHMA A156.12-2013 Interconnected Locks and Latches.
  .11 ANSI/BHMA A156.13-2012 Mortise Locks and Latches Series 1000.
  .12 ANSI/BHMA A156.15-2011 Release Devices - Closer Holder, Electromagnetic and Electromechanical.
  .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 Manufacturers' Association (CSDMA)
  .1 CSDMA Canadian Metric Guide for Steel Doors and Frames (Modular Construction): Standard Hardware Location Dimensions.
.3 Door Hardware Institute (DHI)
.4 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: Submit manufacturer's printed 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: Submit manufacturer's installation instructions.

.6 Provide operation and maintenance data for door closers, locksets, door holders and electrified hardware for incorporation into Operations and Maintenance Manuals specified in Section 01 78 00 - Closeout Submittals.

1.5 Quality Assurance

.1 Regulatory Requirements:
  .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.

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 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 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.

.3 All door handles shall be lever type meeting requirements of the referenced accessibility standards and the Ontario Building Code.

.4 Power Door Operators and controls shall be CSA approved and shall meet the requirements of the Ontario Building Code and the Accessibility for Ontarians with Disabilities Act (AODA).

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 Keying: All permanent cylinders to be grandmaster-keyed as directed by the Owner. The factory shall key all locks and cylinders and maintain keying records. The factory shall establish a System Information Document (SID) to designate primary system administrators and require a separate letter of authorization for all future shipments of keyed products.

.2 Remove all construction cores and install all permanent cores. Unless otherwise directed by the Owner.

.3 Construction master/change keys are to be delivered by the Contractor directly to The Owner.

.4 Ship all permanent cylinders and keys separately. Identify door number and keyset symbol on each envelope for direct factory delivery to the owner.

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 Installation of hardware shall be in accordance with ANSI A115.1G, manufacturer's templates and instructions.

.2 Install each item of mechanical and electromechanical hardware and access control equipment to comply with the manufacturer's written instructions and according to specifications. All items to be installed with fasteners identified by manufacturer's installation instructions unless otherwise noted.

.3 Mounting Heights: Install door hardware at heights indicated in the following applicable publications unless; specifically indicated or required by local governing regulations, requirements to match for special templates, necessary coordination with door elevations, and or to ensure consistency with pairs of doors.

.1 DHI's "Recommended Locations for Architectural Hardware for Standard Steel Doors and Frames"
.2 DHI's "Recommended Locations for Architectural Hardware for Wood Flush Doors"
.3 ANSI/ICC A117.1 Accessibility Guidelines for Buildings and Facilities
.4 NWWDA
.5 AODA

.4 Power door operator products and accessories are required to be installed by an AAADM certified technician as approved by the manufacturer. Adjust for proper opening and closing operation after final balancing of HVAC system.

.5 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.

.6 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.

.7 Install all materials as listed in the Finishing Hardware Schedule on the doors and frames listed. Interchanging of hardware will not be allowed.

.8 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.

.9 Where door stop contacts door pulls, mount stop to strike bottom of pull.

.10 Remove construction cores when directed by Owner's Representative.

.11 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 Field Quality Control

.1 Conduct periodic inspections to ensure that door frames are installed plumb, level and square with verification by installer prior to installation of doors and door hardware.

.2 Hardware supplier to attend site meetings as required to ensure proper execution of the guidelines set forth herein.

.3 Hardware supplier will perform final field inspection of installed door hardware after final adjustment of all products and will document and report any deficiencies or omissions for correction and written acceptance by the Contractor.

3.6 Adjusting

.1 Adjust door hardware, operators, closers 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.

3.7 Demonstration

.1 Instruct Owner's maintenance personnel in the proper adjustment, operation and maintenance of mechanical and electromechanical door hardware, electronic devices and maintenance of finishes.

3.8 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.

End of Section

Rivett Architectural Hardware Ltd.

Door Listing

O'NEIL CVI-WASHROOM & INT RENO - 301 SIMCOE ST N. OSHAWA, ON

Schedule 200817
Date Mar 31/26

Door Number	Set Number
1101A	1
1126	2
1127	3
1127A	4
1127B	4
1129A	5
1129B	5
1129C	5
1129D	5
1129E	5
1129F	5
1129G	5
1129H	5
1129I	5
1129J	5
1129K	5
1130	6
1131	7

Rivett Architectural Hardware Ltd.

Hardware Schedule

O'NEIL CVI-WASHROOM & INT RENO - 301 SIMCOE ST N. OSHAWA, ON

Schedule **200817**
Date **Mar 31/26**

Set # **1**

1 SGLE. DR. # 1101A EXISTING CORRIDOR TO CUSTODIAL STORAGE RH

1 - 915 x 2134 x 45 x PSF x HMD X 45 MIN RATED

		Qty			
:	:	3	EA	HINGE	BB1168-114 X 101- 626
:	:	1	EA	CLASSROOM LOCK	L9070P X 03B X 626
:	:	1	EA	CLOSER	4040XP X 689
:	:	1	EA	WALL STOP	232W X 626
:	:	1	EA	KICKPLATE	190S X 203 X 863 X 630

Set # **2**

1 SGLE. DR. # 1126 EXISTING CORRIDOR TO CLASSROOM 1126 LH

1 - 915 x 2134 x 45 x PSF x HMD x 45 MIN RATED

		Qty			
:	:	3	EA	HINGE	BB1168-114 X 101- 626
:	:	1	EA	CLASSROOM LOCK C/W INDICATOR	L9071P X 03B X IS-LOC 626
:	:	1	EA	CLOSER	4040XP X 689
:	:	1	EA	WALL STOP	232W X 626
:	:	1	EA	KICKPLATE	190S X 203 X 863 X 630

Set # **3**

1 SGLE. DR. # 1127 EXISTING CORRIDOR TO CUSTODIAL OFFICE 1127 LH

1 - 915 x 2134 x 45 x PSF x HMD

		Qty			
:	:	3	EA	HINGE	BB1168-114 X 101- 626
:	:	1	EA	CLASSROOM LOCK	L9070P X 03B X 626
:	:	1	EA	CLOSER	4040XP X 689
:	:	1	EA	WALL STOP	232W X 626
:	:	1	EA	KICKPLATE	190S X 203 X 863 X 630

Rivett Architectural Hardware Ltd.

Hardware Schedule

O'NEIL CVI-WASHROOM & INT RENO - 301 SIMCOE ST N. OSHAWA, ON

Schedule **200817**
Date **Mar 31/26**

Set # **4**

1 SGLE. DR. # 1127A EXISTING CORRIDOR TO STAFF WASHROOM 1127A	RH
1 SGLE. DR. # 1127B EXISTING CORRIDOR TO STAFF WASHROOM 1127B	LH

2 - 762 x 2134 x 45 x PSF x HMD

	Qty			
: :	6	EA	HINGE	BB1168-114 X 101- 626
: :	2	EA	ENTRANCE LOCK C/W INDICATOR	L9056P-03B-XL13-439-OC-OCC-626
: :	2	EA	CLOSER	4040XP X 689
: :	2	EA	WALL STOP	232W X 626
: :	2	EA	SWEEP	W24S X 3'-0" X 628
: :	2	EA	KICKPLATE	190S X 203 X 711 X 630

Set # **5**

1 SGLE. DR. # 1129A WASHROOM LOBBY 1129 TO WASHROOM 1129A	RH
1 SGLE. DR. # 1129B WASHROOM LOBBY 1129 TO WASHROOM 1129B	LH
1 SGLE. DR. # 1129C WASHROOM LOBBY 1129 TO WASHROOM 1129C	RH
1 SGLE. DR. # 1129D WASHROOM LOBBY 1129 TO WASHROOM 1129D	RH
1 SGLE. DR. # 1129E WASHROOM LOBBY 1129 TO WASHROOM 1129E	RH
1 SGLE. DR. # 1129F WASHROOM LOBBY 1129 TO WASHROOM 1129F	RH
1 SGLE. DR. # 1129G WASHROOM LOBBY 1129 TO WASHROOM 1129	RH
1 SGLE. DR. # 1129H WASHROOM LOBBY 1129 TO WASHROOM 1129	LH
1 SGLE. DR. # 1129I WASHROOM LOBBY 1129 TO WASHROOM 1129	LH
1 SGLE. DR. # 1129J WASHROOM LOBBY 1129 TO WASHROOM 1129	RH
1 SGLE. DR. # 1129K WASHROOM LOBBY 1129 TO WASHROOM 1129	LH

11 - 762 x 2134 x 45 x PSF x HMD

	Qty			
: :	33	EA	HINGE	BB1168-114 X 101- 626
: :	11	EA	ENTRANCE LOCK C/W INDICATOR	L9056P-03B-XL13-439-OC-OCC-626
: :	11	EA	CLOSER	4040XP X 689
: :	11	EA	WALL STOP	232W X 626
: :	11	EA	SWEEP	W24S X 3'-0" X 628
: :	11	EA	KICKPLATE	190S X 203 X 711 X 630
: :	11	EA	WALL BOXES WITH COVERS	FUTURE USE
: :	11	EA	CONDUIT WITH PULL STRINGS	FUTURE USE
			CONDUIT & WALL BOXES TO BE ROUGH IN ONLY FOR FUTURE USE	

Rivett Architectural Hardware Ltd.

Hardware Schedule

O'NEIL CVI-WASHROOM & INT RENO - 301 SIMCOE ST N. OSHAWA, ON

Schedule **200817**
Date **Mar 31/26**

Set # **6**

1 SGLE. DR. # 1130 WASHROOM LOBBY 1129 TO TUNNEL ACCESS 1130 RH

1 - 915 x 2134 x 45 x PSF x HMD x 45 MIN RATED

		Qty			
:	:	3	EA	HINGE	BB1168-114 X 101- 626
:	:	1	EA	STOREROOM LOCK	L9080P X 03B X 626
:	:	1	EA	CLOSER	4040XP X 689
:	:	1	EA	WALL STOP	232W X 626
:	:	1	EA	KICKPLATE	190S X 203 X 863 X 630

Set # **7**

1 SGLE. DR. # 1131 EXISTING CORRIDOR TO UNIVERSAL WASHROOM 1131 LH

1 - 965 x 2134 x 45 x PSF x HMD

		Qty			
:	:	3	EA	HINGE	BB1168-114 X 101- 626
:	:	1	EA	STOREROOM LOCK	L9080P X 03B X 626
:	:	1	EA	DOOR OPERATOR	SW200i X SINGLE HSG X 628
:	:	1	EA	DOOR OPERATOR ADD ON	SW200i ADD FOR INSWING ARM
:	:	1	EA	OCCUPIED & EMERGENCY KIT SURF	#OCC-2-EMR-S ILL KIT
:	:	1	EA	ELECTRIC STRIKE - FAIL SAFE	1600CLB X 630
:	:	1	EA	WALL STOP	232W X 626
:	:	1	EA	KICKPLATE	190S X 203 X 914 X 630
:	:	1	EA	SWEEP	W24S X 4'-0" X 628
:	:	1	EA	SIGNAGE	SUPPLIED BY OTHERS
:	:	1	EA	V-1072A-ST/V-1072B-ST INTERCOM	SUPPLIED BY OTHERS

MAIN 110V POWER SUPPLY & LOW VOLTAGE WIRING & MOUNTING BOXES FOR ACTUATORS & ASSOCIATED ACCESSORIES TO BE DONE BY ELECTRICAL DIVISION.

POWER OPERATOR AND ASSOCIATED ELECTRONIC ACCESSORIES TO BE SUPPLIED & INSTALLED BY HARDWARE SUPPLIER

RIVETT ARCHITECTURAL HARDWARE LTD.

B/F WASHROOM DOOR C/W AUTOMATIC OPERATOR & #OCC2 EMR-S-ILL KIT

CM-AF501SO: English
Single Gang LED Annunciator c/w Sounder,
'ASSISTANCE REQUESTED'
TO BE MOUNTED ON EXTERIORIOR SIDE OF DOOR
G.C. TO MOUNT 2"X4" SIINGLE GANG BOXES AT THESE LOCATIONS

OPERATOR NORMALLY INSTALLED ON PUSH SIDE OF DOOR. CUSTOM PULL ARM IS REQUIRED IF OPERATOR HAS TO BE INSTALLED ON PULL SIDE OF DOOR.

ELECTRICAL SERVICE 120 VAC 50/60 HZ. 15/20A. BY ELECTRICAL CONTRACTOR

DR# D1131

6 LOW VOLTAGE 22 AWG STRANDED WIRES FROM OPERATOR TO *EACH ACTIVATION DEVICE*

CX-33 WASHROOM CONTROL UNIT (MOUNTED IN DOOR OPERATOR HEADER CASE)

DOOR OPERATOR | CX-33

CX-MDC MAGNETIC DOOR CONTACT SWITCH WIRED TO CX-33 TOO RE-SET SYSTEM ONCE DOOR IS CLOSED 2 WIRE BY INSTALLER

6 LOW VOLTAGE 22 AWG STRANDED WIRES FROM OPERATOR

2 LOW VOLTAGE 18 GAUGE STRANDED WIRES FROM OPERATOR TO ELECTRIC STRIKE

CM-AF540SO: English
Mushroom pushbutton/Annunciator, stainless steel faceplate, push/pull, 'PRESS FOR EMERGENCY ASSISTANCE'
TO BE MOUNTED NEXT TO TOILET
G.C. TO MOUNT 4" X 4" DOUBLE GANG BOX AT THIS LOCATION

CM45/4-CM54GR CM-54/SE1
PUSH TO OPEN PUSH BUTTON
MOUNTING HEIGHT TO BE 900mm MIN. TOO 1100mm MAX.
MOUNT OUT SIDE WASHROOM
G.C. TO MOUNT CM54I BOX AT THIS LOCATION

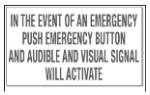
CM45/4-CM43CBL
PUSH TO OPEN PUSH BUTTON
MOUNTING HEIGHT TO BE 900mm MIN. TOO 1100mm MAX.
MOUNT IN SIDE WASHROOM
G.C. TO MOUNT CM43CBL BOX AT THIS LOCATION

CM45/8-CM5GR CM-54/SE1
PUSH TO LOCK PUSH BUTTON
MOUNTING HEIGHT TO BE 900mm MIN. TOO 1100mm MAX.
MOUNT INSIDE WASHROOM
G.C. TO MOUNT CM54I BOX AT THIS LOCATION

ELECTRIC STRIKE FAIL-SAFE OR ***FAIL – SECURE FOR FIRE RATED APPLICATIONS***

STOREROOM FUNCTION LEVER LOCK

HOLLOW METAL OR WOOD FLUSH DOOR AND FRAME BY OTHERS



CM-SE21A
English solid white sign, 6"H x 10 5/8"W (152mm x 270mm) 'IN THE EVENT OF AN EMERGENCY PUSH EMERGENCY BUTTON AND AUDIBLE AND VISUAL SIGNAL WILL ACTIVATE'

EXPLANATION OF USE:

B/FREE OPERATION

1. TO OPEN DOOR ACTIVATE THE DOOR BY THE EXTERIOR HANDICAPPED PUSHPLATE AND THE DOOR WILL SLOWLY POWER OPEN, TIME OUT AND SLOWLY CLOSE.
2. TO LOCK DOOR FOR PRIVACY ACTIVATE PUSH TO LOCK SWITCH. POWER WILL BE CUT TO EXTERIOR HANDICAPPED PUSH PLATE CREATING PRIVACY.
3. ALSO ON ACTIVATION OF THE INTERIOR PUSH TO LOCK SWITCH THE EXTERIOR LIGHTED BUTTON & SIGN WILL LITE UP.
4. TO EXIT WASHROOM ACTIVATE INTERIOR HANDICAPPED PUSHPLATE AND THE DOOR WILL SLOWLY OPEN.

MANUAL NON B/FREE OPERATION

5. IN A ***NON FIRE RATED*** APPLICATION, IF THE WASHROOM IS VACANT THE DOOR CAN BE MANUALLY PUSHED OPEN AS THE ELECTRIC STRIKE WILL NOT BE ENGAGGED.
6. IN A ***FIRE RATED*** APPLICATION A KEY WILL BE REQUIRED TO OPERATE THE DOOR MANUALLY THE KEY WILL UNLOCK THE STOREROOM FUNCTION LOCKSET AS THE ELECTRIC STRIKE MUST BE ENGAGED TO MEET THE FIRE CODE REQUIERMENT FOR SELF LATCHING. OR EXTERIOR ACTUATOR WILL OPEN DOOR WHEN NOT OCCUPIED.

EMERGENCY CALL SYSTEM

IN THE EVENT OF AN EMERGENCY, ACTIVATING THE "PRESS FOR EMERGENCY ASSISTANCE" BUTTON WILL RELEASE THE ELECTRIC STRIKE AND WILL ACTIVATE SOUNDERS AND ILLUMINATE SIGNS.

NOTES:

1. THIS WIRING SCHEMATIC DIAGRAM IS APPLICABLE TO BESAM POWERSWING OR SW200i DOOR OPERATORS ONLY. COORDINATE WITH RIVETT ARCHITECTURAL HARDWARE FOR WIRING DETAILS.
2. DOOR OPERATOR SYSTEM SHALL BE SUPPLIED AND INSTALLED BY RIVETT ARCHITECTURAL HARDWARE LTD.
3. 120VAC WIRING TO DOOR OPERATOR HEADER AND LOW VOLTAGE WIRING WITH ELECTRCIAL BOXES FOR SWITCHES WILL BE BY ELECTRICAL CONTRACTOR

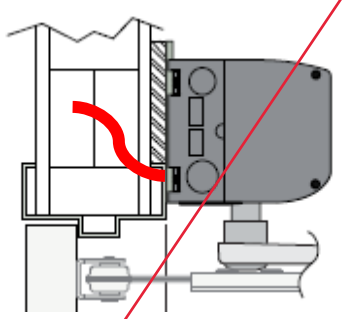
PULL SIDE BUTTONS
NO CLOSER THAN
600 mm – 23 ½"
BEYOND DOOR SWING

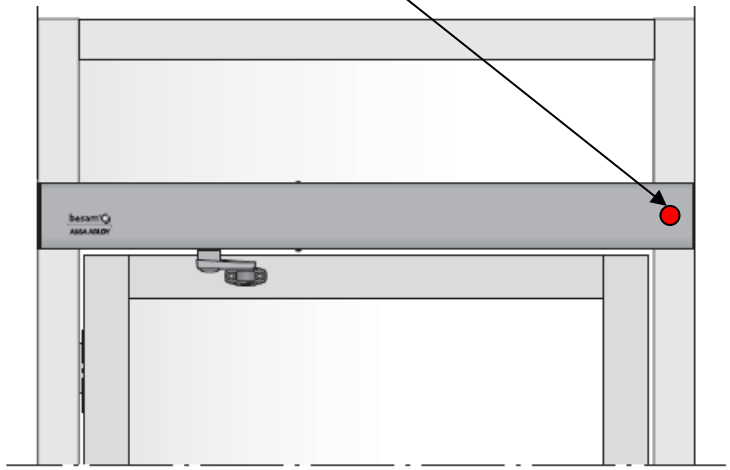
REQUIRES 3 SINGLE GANG BOX INTERIOR
REQUIRES 1 DOUBLE GANG BOX INTERIOR
REQUIRES 2 SINGLE GANG BOX EXTERIOR

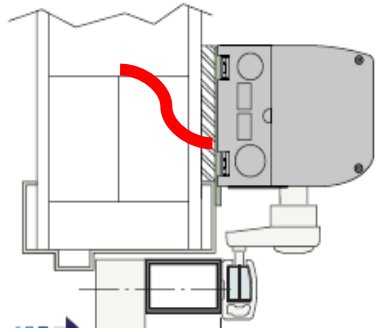
RIVETT ARCHITECTURAL HARDWARE LTD.

STANDARD WIRE LOCATIONS FOR DOOR OPERATORS

SUPPLY VOLTAGE & LOW VOLTAGE CONTROL WIRES TO EXIT AT STRIKE SIDE OF FRAME, OR AT 36" FROM HINGE EDGE OF DOOR ON DOUBLE DOOR APPLICATION. LEAVE SUFFICENT WIRE TO REACH TO OPPOSITE SIDE OF DOOR.







STANDARD PUSH SIDE MOUNTED OPERATOR

WIRES TO EXIT THROUGH FRAME AT STRIKE OF THE FRAME AS SHOWN

IF IT IS A DOUBLE DOOR APPLICATION THEN WIRES TO EXIT 36" FROM HINGE EDGE OF DOOR.

CUSTOM PULL SIDE MOUNTED OPERATOR

WIRES TO EXIT BETWEEN 1" & 3" ABOVE FRAME AT STRIKE SIDE OF THE FRAME AS SHOWN.

IF IT IS A DOUBLE DOOR APPLICATION THEN WIRES TO EXIT 36" FROM HINGE EDGE OF DOOR.

PRODUCT SPECIFICATIONS

For more information visit www.hagerco.com

BB1168

BB1168

SPECIFICATIONS

Applications	For use on heavy weight doors and doors requiring high frequency service
Box Quantity	3
Case Quantity	24
Certifications	ANSI A8111
Electric Modifications	EMN (Electric Monitor Only), ETW (Electric Through-Wire Only), ETM (Electric Through-Wire with Monitoring), Quick Connect
Features	• Four ball bearings • Removable or non-removable pin with button tip and plug • Available in two different leaf sizes
Finishes	• LS, USP, US3, US10, US10A, US10B, US15, US26, US26D • Additional finishes may be available, please contact Hager for availability and lead time.
Fire Rating	Complies with NFPA80 requirements for use on fire rated door assemblies
Gauge	See Sizing Chart Options
Height	See Sizing Chart Options
Knuckles	5
Material	Steel with Steel Pin
Options	• Stamped with UL logo when ordered for export • Unequal top/bottom available in non-removable or removable pin
Product Description	Full Mortise, Ball Bearing, Heavy Weight
Width	See Sizing Chart Options

L Series

Grade 1, Mortise Locks

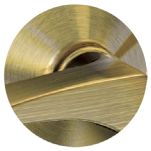
OVERVIEW

The Schlage® L Series has long been the benchmark for Grade 1 mortise locks. Beyond strength and security–it offers flexibility to meet most needs. 67 mechanical functions include ten non-levered small- and large-case deadbolt functions and 15 electrified functions regularly used as part of electronic access control systems, six of which feature motorized latch retraction. L Series locks have the ability to suite across electronic, tubular, exit trim, and multi-point locks to integrate seamlessly into any environment. The series features an array of security options including patented, 180-degree high visibility lock status indication trim, key override of a thumbturn being held, and support for multiple keyway families and cylinder types including Primus® XP high-security cylinders.

FINISHES

605
Bright Brass

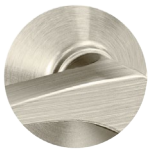
606
Satin Brass



609
Antique Bronze

612[1]
Satin Bronze

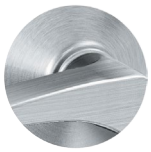
613[1]
Oil Rubbed Bronze



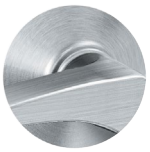
619
Satin Nickel

622
Matte Black

625
Bright Chrome



626
Satin Chrome



626AM
Satin Chrome Antimicrobial

629[2]
Bright Stainless Steel

630[2]
Satin Stainless Steel

630AM[2]
Satin Stainless Steel Antimicrobial

643e
Aged Bronze

1. Available on standard levers only, not available on Latitude, Longitude, Accent, Asti, or Merano.
2. Not available on Accent, Asti, or Merano.

STANDARD LEVER AND KNOB STYLES

01
801 - Milled tactile warning

02
802 - Knurled tactile warning[1]

03 (Tubular)
803 - Knurled tactile warning[1]

05
805 - Milled tactile warning

06 (Rhodes)
806 - Milled tactile warning

07 (Athens)
807 - Milled tactile warning

12
812 - Milled tactile warning
Handed

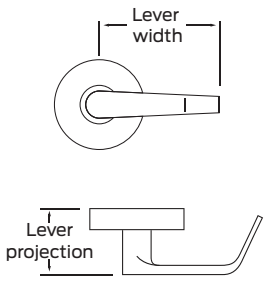
17 (Sparta)
817 - Milled tactile warning

18
818 - Milled tactile warning

Dimensions

Lever	Width	Projection
01	3.88"	2.69"
02	4.75"	2.81"
03 (Tubular)	4.75"	2.81"
05	3.75"	2.88"
06 (Rhodes)	4.63"	2.5"
07 (Athens)	4.63"	2.88"
12	4.63"	3.06"
17 (Sparta)	4.75"	3"
18	4.88"	2.69"

Return to door meets 1/2" requirement for 03, 06 and 17 levers.



1. Knurled tactile warning available on 609, 612, 613, 625, 626, 629, and 630 finishes only.

Note: Images shown with Schlage L mortise 'A' rose; additional rose and escutcheon designs available.

ESCUTCHEONS

L full face
Specify by adding 'L' after lever design.

Finishes: available in all L Series finishes.

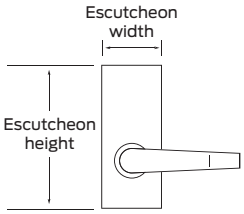
L concealed
Specify by adding 'C' suffix to function and by adding 'L' after lever design.

Finishes: available in all L Series finishes.

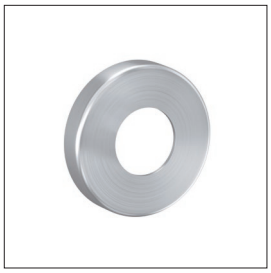
N full face
Specify by adding 'N' after lever design.

Finishes: available in all L Series finishes.

Escutcheon	Width	Height
L full face	1.75"	7.938"
L concealed	1.75"	7.938"
N full face	2.5"	7.875"



ROSES

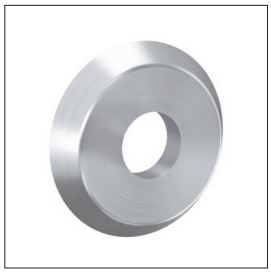


A rose
Available for use on L Series knob and lever designs. Specify by adding 'A' after lever design.

Finishes: available in all L Series finishes.

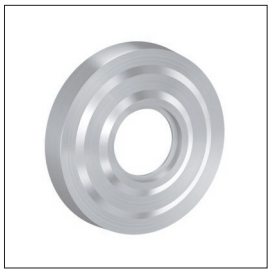
B rose
Available for use on L Series knob and lever designs. Specify by adding 'B' after lever design.

Finishes: available in all L Series finishes.



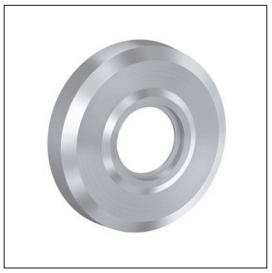
C rose
Available for use on L Series knob and lever designs. Specify by adding 'C' after lever design.

Finishes: 605, 606, 609, 619, 622, 625, 626, 629, 630, 643e.



AVA rose
Available for use with AST lever only. Specify as ASTAVA.

Finishes: 605, 606, 609, 619, 622, 625, 626, 643e.



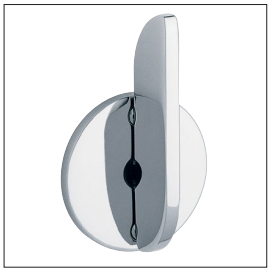
MER rose
Available for use with MER lever only. Specify as MERMER.

Finishes: 605, 606, 609, 619, 622, 625, 626, 643e.

Rose	Diameter
A	2.125"
B	2.562"
C	2.625"
AVA	2.625"
MER	2.625"

THUMBTURNS

ADA thumbturn (standard)
09-544



Large ADA thumbturn
09-509 x L583-363
Not available with L9463 and L463

Basic thumbturn

INDICATORS

Inside Trims

Thumbturn

Key cylinder

Chevron

Standard for lock functions L9486, L9496 and L496, used with A or B roses only. Available messages: "OCCUPIED", "DO NOT DISTURB" or "LOCKED".

Outside Trims

Emergency key

Coin turn

Key cylinder

Available messages

	LOCKED	OCCUPIED	DO NOT DISTURB	
	UNLOCKED	VACANT		
Inside trim	IS-LOC	IS-OCC	IS-DND	IS-SYM
Outside trim	OS-LOC	OS-OCC	OS-DND	OS-SYM
Inside trim	IS-LOCFR	IS-OCCFR	–	–
Outside trim	OS-LOCFR	OS-OCCFR	–	–

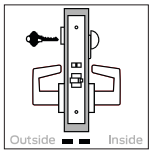
Note: Spanish language options available via RFQ.

Dimensions

	Width	Height
Escutcheon	2.6"	9.7"
Sectional	2.6"	6.1"
Main window	2"	0.6"
Side windows	0.3"	0.6"

Single Cylinder Non-Deadbolt Functions

Schlage **ANSI**
L/LV9056 **-**
L/LV9056 with XL13-439



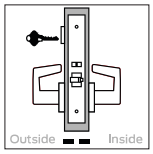
Entrance/office lock with automatic unlocking

- Key cylinder outside; thumbturn inside; latchbolt and deadlocking auxiliary latch
- Latchbolt retracted by lever (or knob) from either side
- Outside lever is made inoperative by key outside or by turning inside thumbturn; Vandlgard® option allows outside lever to rotate freely down while locked
- Key outside unlocks outside lever and retracts latchbolt; XL13-439 option also allows key override of thumbturn if being held in locked position
- Rotating inside thumbturn unlocks outside lever; turning inside lever retracts latchbolt and unlocks outside lever; closing door also unlocks preventing lock-out
- Inside lever always free for immediate egress

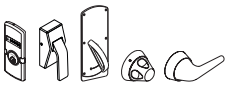
Note: Ligature-resistant trims not available with Vandlgard option.

To order with key override, specify function and note XL13-439 as a special option.

Schlage **ANSI**
L/LV9070 **F05**



Classroom lock, exterior lockdown only

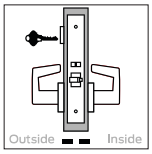


- Key cylinder outside with lever (or knob); lever only-inside; latchbolt and deadlocking auxiliary latch
- Latchbolt retracted by lever from either side
- Outside lever is made inoperative by key outside; Vandlgard® option allows outside lever to rotate freely down while locked
- Key outside unlocks outside lever and retracts latchbolt
- Inside lever always free for immediate egress

Note: Outside lever remains inoperative until unlocked by key.

Note: Hospital latch and ligature-resistant trims not available with Vandlgard option.

Schlage **ANSI**
L/LV9076 **F06**



Classroom holdback lock, exterior lockdown only

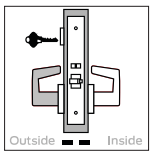
- Key cylinder outside with lever (or knob); lever only-inside; latchbolt and deadlocking auxiliary latch
- Latchbolt retracted by lever from either side
- Outside lever is made inoperative by key outside; Vandlgard® option allows outside lever to rotate freely down while locked
- Key outside unlocks outside lever and retracts latchbolt
- Rotate inside lever while turning key 360° to activate retracted latch holdback feature; to deactivate, reverse key rotation 360°
- Inside lever always free for immediate egress

Note: Outside lever remains inoperative until unlocked by key.

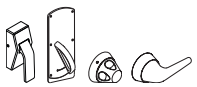
Note: Locks with holdback feature are not UL listed. Installation should be in accordance with existing codes only.

Note: Ligature-resistant trims not available with Vandlgard option.

Schlage **ANSI**
L/LV9080 **F07**



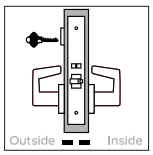
Storeroom lock



- Key cylinder outside with lever (or knob); lever only-inside; latchbolt and deadlocking auxiliary latch
- Outside lever always fixed; latchbolt retracted by inside lever; Vandlgard® option allows outside lever to rotate freely down while locked
- Key outside retracts latchbolt
- Inside lever always free for immediate egress

Note: Hospital latch and ligature-resistant trims not available with Vandlgard option.

Schlage **ANSI**
L/LV9081 **-**



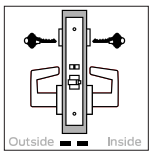
Accessible storeoom lock

- Key cylinder outside with lever (or knob); lever only-inside; latchbolt and deadlocking auxiliary latch
- Latchbolt retracted by lever from either side
- Outside lever is made inoperative by key outside; Vandlgard® option allows outside lever to rotate freely down while locked
- Key outside inserted and turned 280° unlocks allowing outside lever to retract latchbolt
- Inside lever always free for immediate egress

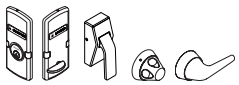
When ordering, specify door handing.

DOUBLE CYLINDER NON-DEADBOLT FUNCTIONS

Schlage L/LV9060 — **ANSI** F09



Apartment entrance lock

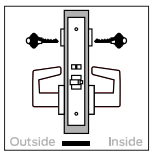


- Key cylinder both sides; latchbolt and deadlocking auxiliary latch
- Latchbolt retracted by lever (or knob) from either side
- Outside lever is made inoperative by key inside; Vandlgard® option allows outside lever to rotate freely down while locked
- Key outside retracts latchbolt but cannot lock or unlock outside lever
- Rotating inside lever retracts latchbolt; key inside retracts latchbolt and unlocks outside lever
- Inside lever always free for immediate egress

Note: Outside lever remains inoperative until unlocked by key inside.

Note: Hospital latch and ligature-resistant trims not available with Vandlgard option.

Schlage L9066 — **ANSI** -



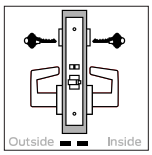
Store lock

- Key cylinder both sides; latchbolt and deadlocking auxiliary latch
- Latchbolt retracted by lever (or knob) from either side
- Both levers are made inoperative by key from either side
- Key use on either side unlocks both levers and retracts latchbolt

Caution: Double cylinder locks on any door, in any structure which is used for egress are a life safety hazard in times of emergency and their use is not recommended. Installation should be in accordance with existing codes only.

Note: Ligature-resistant trims not available with Vandlgard option.

Schlage L/LV9071 — **ANSI** F32



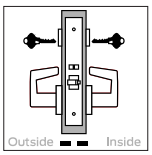
Classroom security lock, interior/exterior lockdown

- Key cylinder both sides; latchbolt and deadlocking auxiliary latch
- Latchbolt retracted by lever (or knob) from either side
- Outside lever is made inoperative by key from either side; Vandlgard® option allows outside lever to rotate freely down while locked
- Rotating inside lever retracts latchbolt; key on either side unlocks outside lever and retracts latchbolt
- Inside lever always free for immediate egress

Note: Outside lever remains inoperative until unlocked by key.

Note: Ligature-resistant trims not available with Vandlgard option.

Schlage L/LV9077 — **ANSI** -



Classroom security holdback lock, interior/exterior lockdown

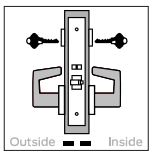
- Key cylinder both sides; latchbolt and deadlocking auxiliary latch
- Latchbolt retracted by lever (or knob) from either side
- Outside lever is made inoperative by key from either side; Vandlgard® option allows outside lever to rotate freely down while locked
- Key outside retracts latchbolt but cannot unlock outside lever
- Rotating inside lever retracts latchbolt; key inside retracts latchbolt and unlocks outside lever
- Rotate inside lever while turning key 360° to activate retracted latch holdback feature; to deactivate, reverse key rotation 360°
- Inside lever always free for immediate egress

Note: Outside lever remains inoperative until unlocked by key inside.

Note: Locks with holdback feature are not UL listed. Installation should be in accordance with existing codes only.

Note: Ligature-resistant trims not available with Vandlgard option.

Schlage L/LV9082 — **ANSI** F30



Institution lock

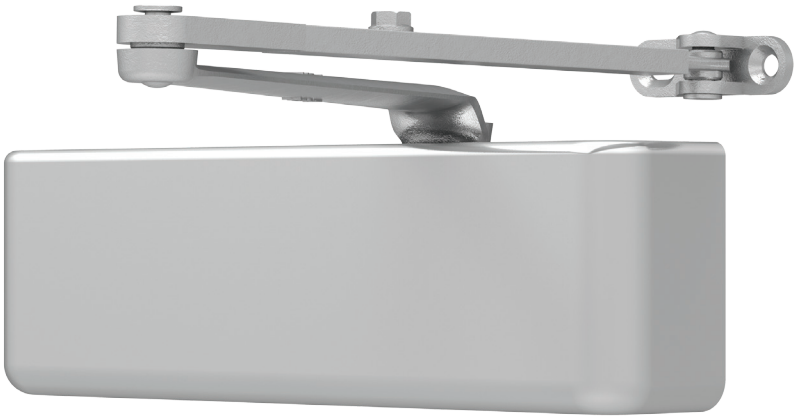
- Key cylinder both sides; latchbolt and deadlocking auxiliary latch
- Both levers (or knobs) always fixed; Vandlgard® option allows both levers to rotate freely down while locked
- Key on either side retracts latchbolt

Caution: Double cylinder locks on any door, in any structure which is used for egress are a life safety hazard in times of emergency and their use is not recommended. Installation should be in accordance with existing codes only.

Note: Hospital latch and ligature-resistant trims not available with Vandlgard option.

4040XP Series

Features

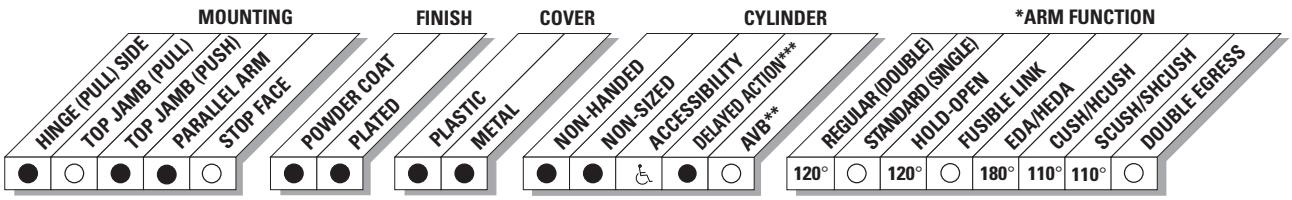


The 4040XP is LCN's most durable and flexible heavy duty closer designed for institutional and other demanding high traffic applications.

Certifications	Grade 1 - ANSI A156.4, UL 10C, ADA, 100 Hour Salt Spray, Meets BAA - Buy American Act
Body Construction	■ Cast Iron Body ■ Full Complement Bearings ■ 1-1/2″ Diameter Piston ■ 3/4″ Diameter Double Heat Treated Pinion Journal
Fluid	All Weather Liquid X Fluid
Handing	Non-Handed
Templating	Peel-n-Stick templates - 2-1/4″ x 5″ Mounting Hole Pattern
Size	Adjustable Spring Size 1-6, includes Patented Green Dial
Warranty	30 years

Cover	■ Plastic, Standard ■ Metal, Optional
Fasteners	Self Reaming and Tapping Screws (SRT)
Mounting	Hinge (Pull Side), Top Jamb (Push Side), Parallel Arm (Push Side)
Arms	Regular Arm
Finishes/Colors/ Powder Coat	■ Aluminum (689) ■ Statuary Bronze (690) ■ Light Bronze (691) ■ Black (693) ■ Dark Bronze (695) ■ Brass (696) ■ Custom colors optional ■ Optional SRI primer - powder coat only ■ Optional plated finishes

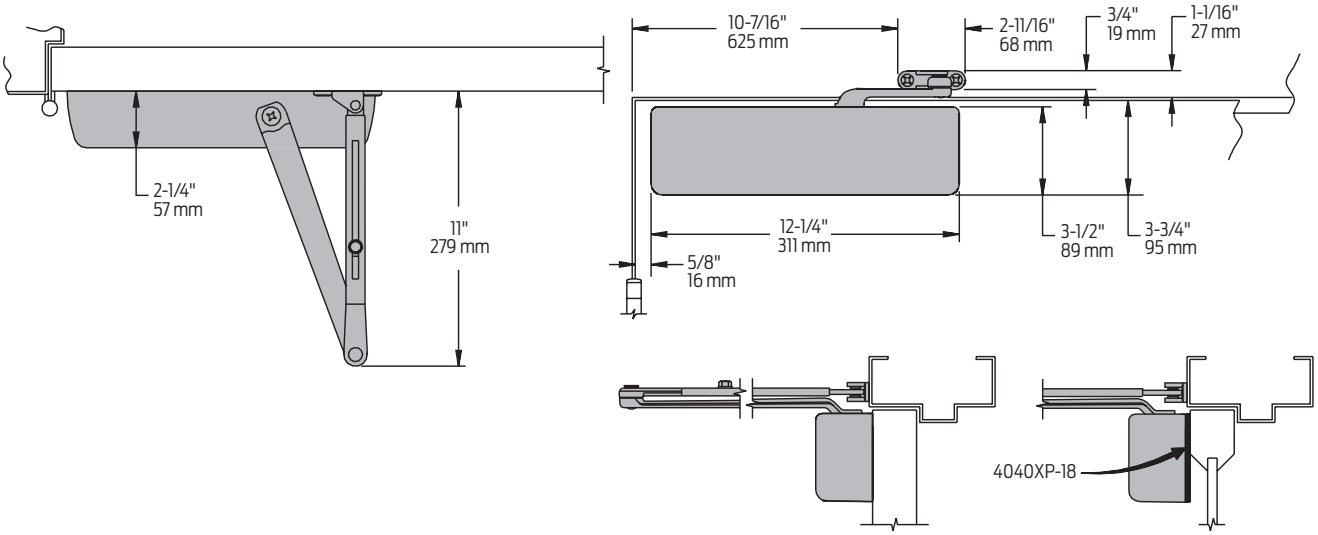
Special Templates | Customized installation templates or products may be available to solve unusual applications. Contact LCN Product Support for assistance.



● AVAILABLE
○ NOT AVAILABLE

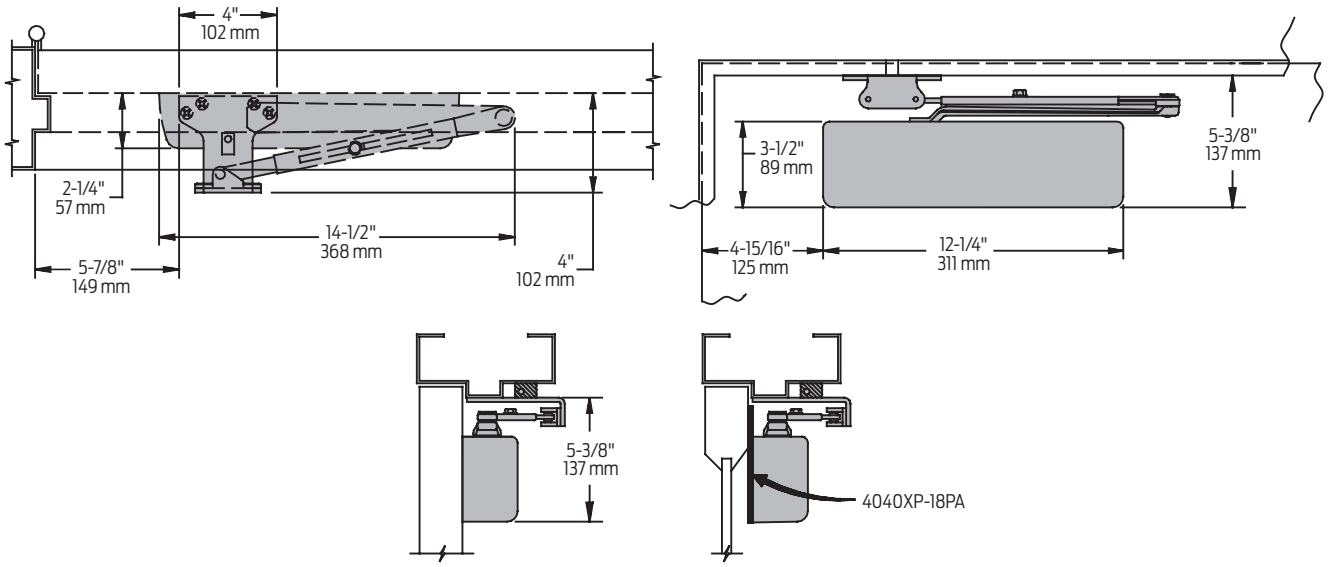
♿ *Closer available with less than 5.0 lbs. opening force on 36″ door.*
* *Maximum opening/hold-open point with standard template.*
** *Advanced Variable Backcheck.*
*** *Delay feature incorporates standard 4040 cylinder (not XP).*

Hinge (Pull Side) Mounting



Butt Hinges	■ Should not exceed 5″ (127 mm) in width
Auxiliary Stop	■ Recommended at hold-open point or where a door cannot swing beyond 120°
Reveal	■ Should not exceed 3/4″ (19 mm) for regular arm or hold-open arm
Top Rail	■ Less than 3-3/4″ (95 mm) requires PLATE, 4040XP-18. Plate requires 2″ (51 mm) minimum
Clearance	■ 2-3/8″ (60 mm) behind door required for 90° installation
Delayed Action	■ Incorporates standard 4041 cylinder, without XP cylinder ■ Delays closing from 120° to 70° ■ Delay time adjustable up to approximately 1 minute
Maximum Opening	■ Templating allows up to 120°. ■ Hold-open points 90° up to 120° with hold-open arm.

Parallel Arm (Push Side) Mounting



Butt Hinges	Should not exceed 5″ (127 mm) in width
Auxiliary Stop	Recommended at hold-open point, where the door cannot swing 180º, or where CUSH-N-STOP arm is not used
Reveal	Should not exceed 7/32″ (6 mm)
Top Rail	Less than 5-3/8″ (137 mm) measured from the stop requires PLATE, 4040XP-18PA. Plate requires 2″ (51 mm) minimum from the stop
Head Frame	Flush or rabetted requires PA SHOE ADAPTER, 4040XP-419
Stop Width	Minimum 1″ (25 mm). CUSH arm requires minimum 1-1/2″ (38 mm)
Blade Stop	Clearance requires 1/2″ (13mm) BLADE STOP SPACER, 4040XP-61.
Clearance	■ 4040XP-62PA shoe is 4″ (102 mm) from door face. ■ EDA shoe projects 5-1/2″ (140 mm) from door face. ■ CUSH shoe projects 6″ (152 mm) from door face
Delayed Action	■ Incorporates standard 4041 cylinder, without XP cylinder ■ Delays closing from 120º to 70º. ■ Delay time adjustable up to approximately 1 minute.
Maximum Opening	■ 180º opening/hold-open points with all except CUSH arms ■ 110º opening/hold-open with CUSH arms

Notes:

• Optional mounting requires PA SHOE, 4040XP-62PA for regular or HOLD-OPEN arms

• Add prefix "P" to closer description (eg. P4040XP)

• P4040XP closer includes 4040XP-201 FIFTH HOLE SPACER to support PA SHOE

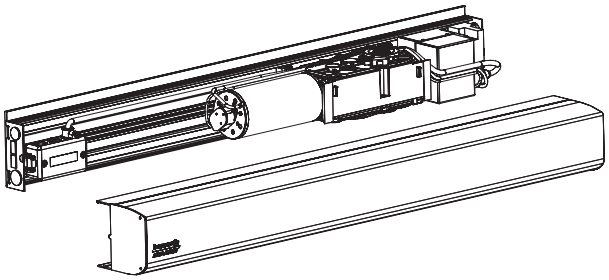
Swing Door
Besam SW200i™

ASSA ABLOY

ASSA ABLOY Entrance Systems

The global leader in door opening solutions

Technical Data Sheet



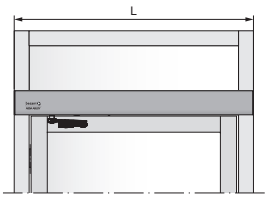
SW200i Swing Door Operator

The Besam SW200i automatic swing operator is intended for use in exterior or interior entryways, corridors and a variety of applications. The Besam SW200i heavy duty (HD) electro-mechanical operator is suitable for use on large heavy doors, yet adaptable enough to be used in low energy (LE) applications. The product can be either surface mounted or overhead concealed, on either side of the door, for pull or push applications. It is suitable for single doors, double doors and double egress doors fitted with swing clear hinges, offset pivots or center pivots. The operator is connected to the door leaf with a range of different arm systems.

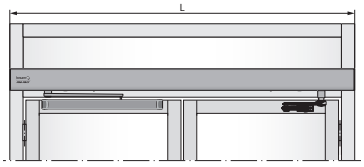
Besam SW200i is designed to offer continuous use, a high degree of safety and maximum performance over the lifetime of your entrance. The Besam SW200i ensures all-around safety and can be equipped with a full range of sensor products providing swing door safety that meets or exceeds ANSI A156.10 standard.

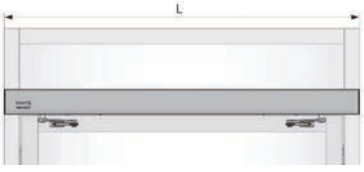
Operator Features and Performance

- Operator: electro-mechanical, non-handed operator, 24 volt, 5/16 hp motor
- ANSI Compliance: Field selectable full pedestrian usage (ANSI A156.10) and low energy (ANSI A156.19)
- Door Weight: up to 700 pounds (315 kg) per operator
- Door Size: up to 48" (consult for wider sizes)
- Manual Push Force: adjustable from 5 lbf – 15 lbf
- Hold Open Time: adjustable from 1.5 seconds to 30 seconds
- Wind Force Dampening: operator mechanically counteracts to wind forces, slowing down the opening or closing of the door
- Stack Pressure Compensation: operator counteracts to positive stack pressures, negative stack pressures, and sudden changes of stack pressures to maintain consistent door speeds
- Intelligent Trajectory Control: operator knows where the door should be at all times and adjusts torque accordingly. Dynamic braking helps cushion the door during opening to prevent going past 90 degrees, or during closing to prevent slamming.
- Extended Closing Torque (ECT): exclusive Extended Closing Torque (ECT) functionality provides extra torque in the last 10 degrees of closing, if needed, to close and latch the door. Speed remains constant so the door stays within ANSI standards.
- Latch Retry: if the door does not latch when closing, the SW200i will detect this condition and immediately open the door to 10 degrees and execute two attempts to latch the door.
- On-board timing sequencer
- On-board 12V or 24V transformer
- Low pass filter (i.e. "delay on make")
- Door position relay
- Kill input to close doors immediately
- Self-learning set-up – measures inertia and door weight
- Low Power Consumption (300 watts, 2.5 amp (max)



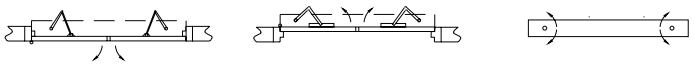
Door Set-ups:
Left: Single
Below Left: Simultaneous Pair
Below Right: Pair Egress





Operation

- Automatic sensor activation (ANSI A156.10)
- Push plate activation (ANSI A156.19 or A156.10)
- Push and go feature allowing door to open automatically when operator senses movement of door (ANSI A156.19)
- Power assist open – provides easy to open push forces (ANSI A156.19)
- Internal, push to open, push to close (i.e., ratchet relay) (ANSI A156.19)
- Speed controlled Extended Closing Torque (ECT) to provide power assist close with on-board functionality to automatically adjust torque without increasing speed
- Loss of Power: the operator controls the door closing, preventing slamming of door
- Torque Limiting: if positive air pressure condition is removed, operator compensates accordingly and will not slam



Door Operator Handings

Electric Lock Management

- Lock monitoring prevents operator(s) from opening door(s) until release of electrified lock
- Operator pulls door closed before opening, unjamming electric latch hardware
- Sequenced operation between operators for pairs of doors allowing lock release and astragal coordination
- Electric Lock Output: selectable 12 VDC, maximum 1200 mA / 24 VDC, maximum 600 mA

Sensor Monitoring

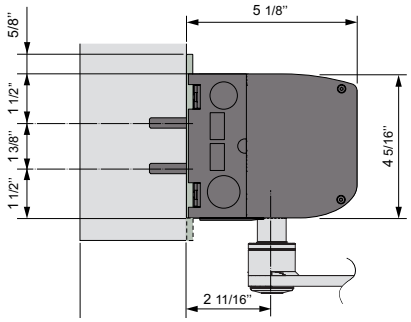
- Monitored Door Mounted Presence Sensors – upon detection of sensor failure, the operator will automatically revert to low energy mode
- Blanking Potentiometer: tells sensors on swing side of door when to shut off
- Sensor Recognition – learn process
- Torque Cancellation – Extended Closing Torque (ECT) is deactivated if signal is received from door mounted presence sensors of a possible obstruction

Aesthetics

- Aesthetically pleasing, low profile appearance: 4-5/16" (109mm) high by 5-1/8" (130mm) deep
- Continuous header for full width of door
- Same header/housing as Besam PowerSwing and Besam SW100 for consistent sightlines in your facility
- Finishes: anodized, powder coat, Kynar, clad

Configurations

- Surface Applied
- Overhead Concealed – center pivoted or offset pivoted doors
- Overhead Concealed – with emergency breakaway
- Side Load
- Bottom Load



Authorities

- UL/CUL approved
- UL Listed Fire Door Operator
- UL10C, UL325, UL991, UL244A, UL1998, UL1310
- IBC and CBC
- ANSI A156.10 / ANSI A156.19
- CAN/CSA-C22.2 NO 223-M91 and CAN/CSA-C22.2 NO 223-M92
- California State Fire Marshall

Sensor Packages

- Sensor Packages as follows:

ANSI A156.19

- Activation: push plates per your selection
- Safety devices: not required per ANSI. Optional door mounted presence sensors (DMPS) are available

ANSI A156.10

- Activation: push plates per your selection (motion sensors or push plates)
- Choice of Besam i-Adapt™ door mounted presence sensor system:
- A202 – Besam i-Adapt Premium – stand alone, adapted field, door mounted presence sensors (DMPS)
- A102– Besam i-Adapt Flex – overhead presence sensor (OPS) and two door mounted presence sensors (DMPS) per leaf (approach and safety)
- A101 – Besam i-Adapt Flex - overhead presence sensor (OPS) and one door mounted presence sensors (DMPS) per leaf (safety)
- A100 – Besam i-Adapt Flex – Knowing Act applications – pair egress only – motion sensor approach and safety side for secondary activation per ANSI A156.10

Authorities	
Operator type	Electro-mechanical
Door width	36" – 48" (914 – 1219mm)
Door weight	100 – 700 lb (45 – 315 kg)
Power supply	120 V AC +10/-15%, 50/60 hz
Power consumption	Max. 300W
Auxiliary voltage	24 V DC, max. 700 mA
Internal control fuse	2 x T 6, 3 AH 250 V
Electro-mechanical locking device	Selectable: 12V DC, max. | 1200 mA / 24 V DC, max. 600 mA
Door opening	**Push:** 80 – 110° with reveal 0 – 12" (0 – 305mm) **Pull:** 80 – 110o with reveal 0 – 5-1/8" (0 – 130mm) **PAS:** 80 – 95° (concealed application)
Opening time (0 – 80°)	Variable between 2 – 12 seconds
Closing time (90 – 100°)	Variable between 4 – 12 seconds
Hold open time	1,5-30 seconds
Ambient temperature	-31° F to 160° F (-35° C to 71° C)
Relative humidity	Max. 85%
Drive weight unit (non-condensing)	19.8 lb (9 kg)
This product is to be installed internally or externally with suitable weather protection.	
Class of protection	IP 20.
Complies with: ANSI/BHMA A156.19, ANSI/BHMA A156.10, UL325, UL 991, UL 244A, UL 1998, UL 1310, UL 10C, CAN/CSA-C22.2 NO 223-M91, CAN/CSA-C22.2 NO 247-92 and CA State Fire Marshall	

ASSA ABLOY Entrance Systems
Tel: 1-866-237-2687 (US) • 1-888-608-9242 (Canada)
info.na.besam@assaabloy.com
assaabloyentrance.us • assaabloyentrance.ca

CM-45/46

4 -1/2" SQUARE ALL - ACTIVE SWITCHES

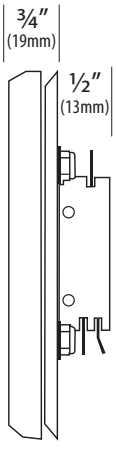
Listed Components

ADA Compliant

CM-45/2
(CONCEALED MOUNTING SCREWS)

CM-46/4
(EXPOSED MOUNTING SCREWS)

CM-46CB/4
(EXPOSED MOUNTING SCREWS)



CM-45/46

FEATURES

- LARGE, EASY TO OPERATE SWITCHES
- ALL-ACTIVE DESIGN REQUIRES MINIMAL ACTUATION FORCE
- MEETS ADA REQUIREMENTS
- CM-45 AND CM-46 OFFER STAINLESS STEEL CONSTRUCTION. CM-46CB ALUMINUM FACEPLATE
- FLUSH MOUNT OR SURFACE MOUNT
- UL/CSA APPROVED SWITCH, RATED 15 AMPS @ 30V DC
- AVAILABLE WITH 'ACTIVE' WHEELCHAIR SYMBOL GRAPHICS
- OPTIONAL ARCHITECTURAL FINISHES

DESCRIPTION

Camden Door Controls CM-45/46 Series all-active switches are heavy-duty, ADA-compliant door controls. The 4-1/2" square faceplates are stainless steel or aluminum, and the assemblies are designed for easy installation.

Both series mount to standard single gang or double gang electrical boxes. CM-45 series is sold as a complete assembly, which is mounted to the in-wall box (or surface box) using stainless steel Allen screws and a hex key (included with the switch). Access to the mounting screws is through small holes in the front of the faceplate. This provides for tamper resistance, while maintaining an attractive overall appearance.

CM-46 series is sold as a two part assembly. The rear assembly is mounted to the in-wall box (or surface box). The front faceplate is then screwed to the rear assembly using either standard or security screws (included with kit).

The SPDT (and optional DPDT) switches are UL/CSA approved, and rated 15 amps @ 30 VDC. The push switches are offered with different graphics, and in various architectural finishes. Weather resistant, and water tight configurations are also available.

APPLICATION

Camden all-active switches are designed for areas where an easy-to-activate, high visibility switch is desired. Ideal for high-traffic areas, hospitals, wheelchair access, seniors' residences, etc. They can be surface or flush mounted.

Camden all-active switches are designed to control electric strikes, electromagnetic locks and automatic doors. They may also be used for shunting, bypassing alarms, request to exit, timed functions, and many other applications.

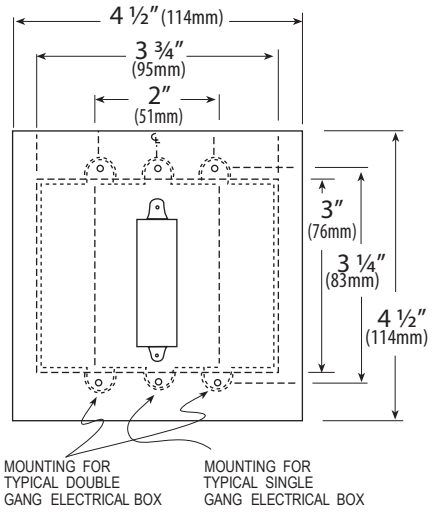
The switches are made for high frequency usage, in both indoor and outdoor environments. Camden switches are versatile, and can be supplied in various configurations and finishes, to suit any commercial, industrial, or residential application.

5502 Timberlea Blvd. Mississauga, ON Canada L4W 2T7 • Toll Free: 1 877 226-3369 (CAMDEN9)
Tel: (905) 366-3377 • Fax: (905) 366-3378 • E-mail: info@camdencontrols.com • www.camdencontrols.com

ARCHITECTS/ENGINEERS SPECIFICATIONS

The switches to be used throughout the complex shall be Camden Door Controls CM-45, CM-46 or CM-46CB series all-active switches.

The switches shall be easy-to-activate, ADA compliant, 4-1/2" square. Switches shall be all-active, whereby pressing any part of the faceplate will activate the device. Faceplates shall be constructed of stainless steel or aluminum. Switches shall use plastic spacers and rubber dampers for noise reduction. Switches shall be rated at a minimum of 15 amps @ 30 VDC.



CM-45/46

ORDERING INFORMATION

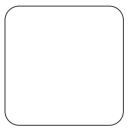
All CM-45/46 series all-active switches are complete ready-to-install assemblies. CM-45 series are supplied with stainless steel Allen screws and an Allen wrench for mounting. CM-46 series are supplied with stainless steel tamperproof screws.

MODEL	DESCRIPTION
CM-45	4-1/2" SQUARE PUSH PLATE SWITCH, CONCEALED SCREWS
CM-46	4-1/2" SQUARE PUSH PLATE SWITCH, EXPOSED SCREWS
CM-46CB	BLUE 4-1/2" SQUARE PUSH PLATE SWITCH, EXPOSED SCREWS. AVAILABLE WITH GRAPHIC OPTION '/1' (BLANK), '/2' (WHEELCHAIR), AND '/4' (WHEELCHAIR + 'PUSH TO OPEN') ONLY.

OPTIONS

(Add suffix to model above)

FACEPLATE GRAPHIC OPTIONS


CM-XX/1


CM-XX/2


CM-XX/A2


CM-XX/2AL


CM-XX/2AR

CM-XX/3

CM-XX/3F

CM-XX/4

CM-XX/A4

CM-XX/4F

CM-XX/4AL

CM-XX/4AR

CM-XX/8

CM-XX/8B

CM-XX/8D

CM-XX/8F

Graphic Colors:
Blue: /2, /A2, /2AL, /2AR, /4, /A4, /4AL, /4AR; /4F
Black: /3, /3F, /8; /8D, 8F,
Red: /8B

ARCHITECTURAL FINISHES: (NOT APPLICABLE TO THE CM-46CB SWITCH)

CM-XXX-AB	ADD 'AB' TO PRODUCT # FOR ANTIQUE BRASS FINISH (BHMA 609, US5)
CM-XXX-SB	ADD 'SB' TO PRODUCT # FOR SATIN BRASS FINISH (BHMA 606, US4)
CM-XXX-OB	ADD 'OB' TO PRODUCT # FOR OIL RUB BRONZE FINISH (BHMA 640, US10B) (NOT COLOR MATCHED) (CANNOT BE CUSTOM LASER ETCHED)
CM-XXX-PB	ADD 'PB' TO PRODUCT # FOR POLISHED BRASS (BHMA 605, US3)

WEATHERPROOF OPTIONS:

CM-XXX-WT	ADD 'WT' TO PRODUCT # FOR BOOT AND WATER TIGHT COATING

CONTACT OPTIONS:

DP: ADD DP TO PRODUCT # TO ORDER DPDT SWITCH INSTEAD OF SPDT SWITCH (USE SPECIAL MOUNTING PLATE/TEMPLATE)

Aura™ Series Illuminated Push Plate Switch Enclosures

UL Listed Components · RoHS Compliant · ADA Compliant

EXCLUSIVE DESIGN

ADVANCED TECHNOLOGY

Camden's Aura™ Illuminated Push Plate Switches lead the way in versatility and performance!

Aura™ Illuminated Surface & Flush Square, and Flush Round push plate switch kits provide high visibility and enhanced user convenience while ensuring your facility's automatic door controls are compliant with local and federal accessibility requirements.

Camden's Aura™ Series push plate switches are available in a selection of red, green or blue illumination switches, incorporates an audible sounder, and Form 'C' contacts allowing for highly accessible convenient means of door activation.

Features

- Illuminated Surface and Flush mounting boxes, compatible with Camden CM-45 & CM-46 4 1/2" Square and CM-40 4 1/2" round push plate switches.
- High efficiency LED technology
- Improves switch visibility, even in daylight.
- Selectable 12 or 24V AC/DC.
- Flame and impact resistant construction.
- Selectable red/green/blue illumination color (CM-54 and CM-55 square models).
- Change of color activated directly (by switch), or remotely (by control relay or access control system)
- Audible (sounder) confirmation of switch activation (selectable 'On' / 'Off').
- 3 year warranty.

SPECIFICATIONS

VOLTAGE:	12V or 24V AC/DC
CURRENT DRAW:	130mA
LUMINA:	**RED:** 5760 MCD, **GREEN:** 3780 MCD, **BLUE:** 1500 MCD
CONTACT TYPE:	1 Form 'C'
CONTACT RATING:	3 Amps @ 24V AC/DC
DIMENSIONS:	**CM-54i:** 5 1/4" W x 5 1/4" W x 2" D (133mm x 133mm x 51mm)
	CM-55i: 6 1/2" W x 6 1/2" H x 2" D (165mm x 165mm x 51mm)
	CM-57GRB: 6 5/8" DIA. x 2" D (168mm x 51mm)

AURA™ ILLUMINATED MODELS

CM-54i	Surface Mount, 4 1/2" Square Aura™ Illuminated Red/Green/Blue Push Plate Switch
CM-55i	Flush Mount, 4 1/2" Square Aura™ Illuminated Red/Green/Blue Push Plate Switch
CM-57GR	Flush Mount, 4 1/2" Round Aura™ Illuminated Red/Green/Blue Push Plate Switch

AURA™ ILLUMINATED SWITCH KITS - SURFACE MOUNT

CM-45/X54	4 1/2" Square Push Plate Switch (Concealed Screws)
CM-46/X54	4 1/2" Square Push Plate Switch (Exposed Screws)

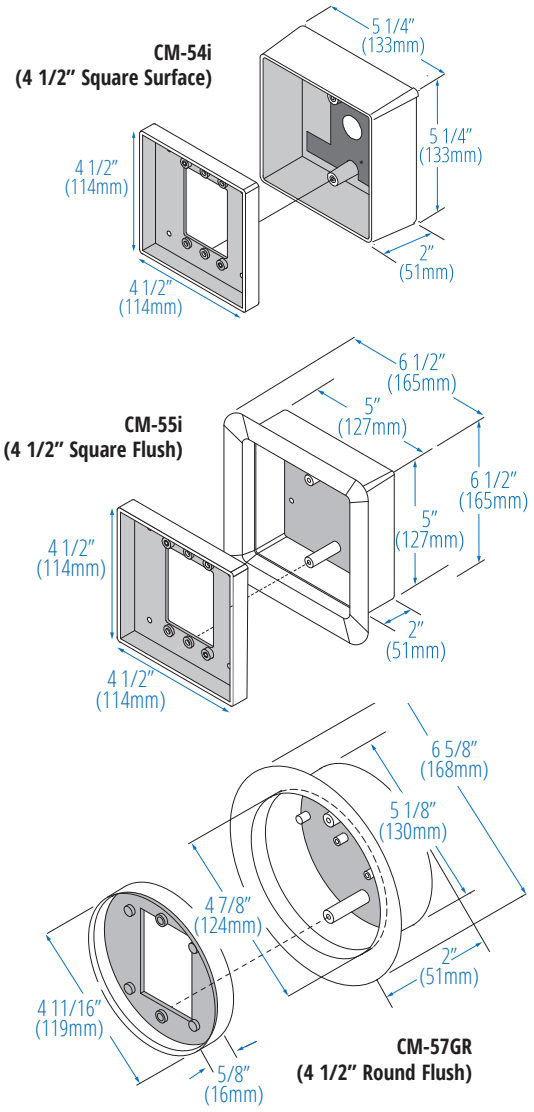
AURA™ ILLUMINATED SWITCH KITS - FLUSH MOUNT

CM-40/XGRF	4 1/2" Round Push Plate Switch (Concealed Screws)
CM-45/X55	4 1/2" Square Push Plate Switch (Concealed Screws)
CM-46/X55	4 1/2" Square Push Plate Switch (Exposed Screws)

OPTIONAL SIGNAGE

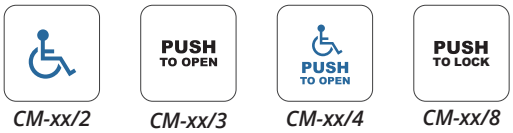
/SE1	English, for **CM-54 SQUARE SURFACE** illuminated mounting box. Double sided sign: 'DOOR LOCKED WHEN RED' / 'UNLOCKED WHEN GREEN' and 'OCCUPIED WHEN RED' / 'VACANT WHEN GREEN'.
/SF1	French, for **CM-54 SQUARE SURFACE** illuminated mounting box. Double sided sign: 'PORTE BARRÉE' / 'PORTE DÉBARRÉE' and 'OCCUPÉ' / 'LIBRE'.
/SFE1	English, for **CM-55 SQUARE FLUSH** illuminated mounting box. Double sided sign: 'DOOR LOCKED WHEN RED' / 'UNLOCKED WHEN GREEN' and 'OCCUPIED WHEN RED' / 'VACANT WHEN GREEN'.
/SFF1	French, for **CM-55 SQUARE FLUSH** illuminated mounting box. Double sided sign: 'PORTE BARRÉE' / 'PORTE DÉBARRÉE' and 'OCCUPÉ' / 'LIBRE'.
/FRE1	English, for **CM-57 ROUND FLUSH** illuminated mounting box. Double sided sign: 'DOOR LOCKED WHEN RED' / 'UNLOCKED WHEN GREEN' and 'OCCUPIED WHEN RED' / 'VACANT WHEN GREEN'.
/FRF1	French, for **CM-57 ROUND FLUSH** illuminated mounting box. Double sided sign: 'PORTE BARRÉE' / 'PORTE DÉBARRÉE' and 'OCCUPÉ' / 'LIBRE'.

DIMENSIONS



FACEPLATE GRAPHIC OPTIONS

Stock graphic options for CM-40, CM-45 and CM-46 push plate kits at no extra cost: /1, /2, /3, /4, /8



CM-xx/2 *CM-xx/3* *CM-xx/4* *CM-xx/8*

Refer to catalog or web-site for additional cost of other stock graphic options. Contact Camden customer service for custom graphics.

CONTACTS

DPDT	DPDT switch contacts cannot be used with Aura™ Illuminated switches. If required, use CX-IRB relay.

CAMDEN DOOR CONTROLS

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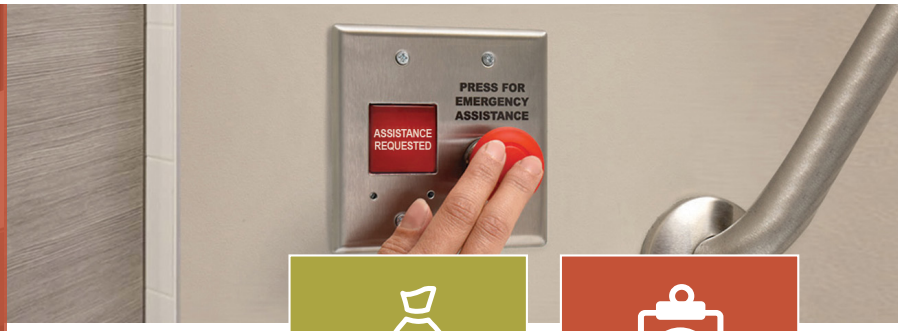
BSI Certified ISO 9001: 2015 FS 541752

Part #: MKTG-LIT-SP-AURASeries

CM-AF500 Series LED Annunciators



BEST VALUE

BEST QUALITY

Camden's CM-AF500 Series illuminated annunciators are designed to provide critical messages to building occupants.

When not illuminated, the sign (text and/or graphics) is invisible. When illuminated, the text/graphics are highly visible - even in bright daylight. CM-AF500 series signs and push buttons are weatherproof and vandal resistant.

Field selectable 12/30V AC/DC operation allows the sign to be used in a variety of low voltage applications, including automatic door, access control and other low voltage systems.

Features

- **CM-AF500:**
  (6) message insert labels included,
  English, French and Bilingual
- **CM-AF503:**
  Horizontal, curved, with (6) message labels
- **CM-AF501SO:**
  'Assistance Required' label, with sounder
  Adjustable 85dB sounder
- **Bright LEDs for high visibility, even in daylight**
- **Text / graphics are not legible when not illuminated**
- **Vandal and weather resistant construction**
- **3 year warranty**

SPECIFICATIONS

VOLTAGE: 12/30V AC/DC

CURRENT DRAW: **CM-AF500 / AF550R:** 30 - 50mA
CM-AF501SO / AF540SO: 30 - 75mA

TEMP RANGE: 32°F - 176°F (0°C - 80°C)

CONSTRUCTION: 18 gauge stainless steel faceplate

SOUNDER: **CM-501SO / CM-AF540SO:** Adjustable, 85dB @ 10cm max.

STD FINISH: US 32/C32D

PUSH BUTTON: **CM-AF540SO:** Maintained (Push/Pull), N/O & N/C, 6A @ 30 VDC
CM-AF550R: Momentary (Spring Action) N/O, 6A @ 30 VDC

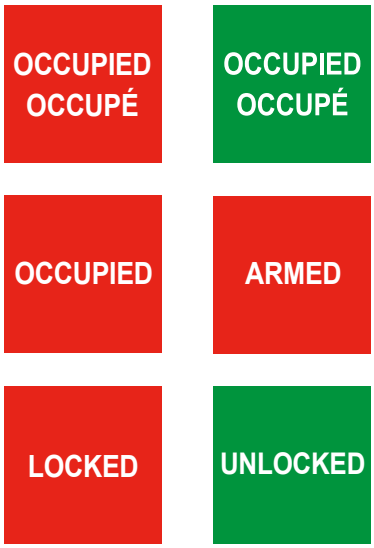
DIMENSIONS: **CM-AF500 / CM-AF501SO:** 4-1/2"H x 2-3/4"W x 9/16"D (114mm x 70mm x 15mm)
CM-AF503: 3"H x 5-9/10"W x 1/20"D (76mm x 127mm x 1mm)
CM-AF540SO / CM-AF550R: 4-1/2"H x 4-1/2"W x 9/16"D (114mm x 114mm x 15mm)

MODELS

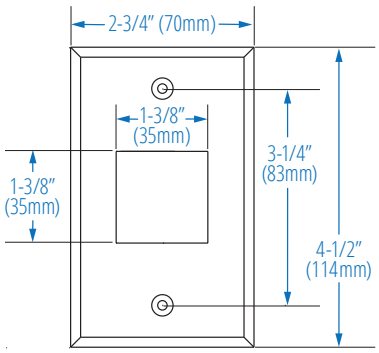
	**CM-AF500**	Single Gang LED Illuminated Annunciator. Labels included: 'Occupied/Occupé' (Red & Green), 'Occupied' (Red), 'Armed' (Red), 'Locked' (Red) and 'Unlocked' (Green).
	**CM-AF503**	Single gang, horizontal, LED illuminated annunciator, curved profile designed for use with Column™ switches. With (6) English, French, and Bilingual message labels.
	**CM-AF501SO**	Single gang LED annunciator with adjustable sounder, 'Assistance Requested'. Add suffix 'F' for French, suffix 'FE' for bilingual.
	**CM-AF540SO**	Double gang, push/pull mushroom push button, red, 'Assistance Required', annunciator and adjustable sounder, 'Assistance Requested'. Add suffix 'F' to model number for French language.
	**CM-AF550R**	Double gang, mushroom push button, red, 'Push to Lock', with LED annunciator. Add suffix 'F' to model number for French language.

GRAPHIC OPTIONS

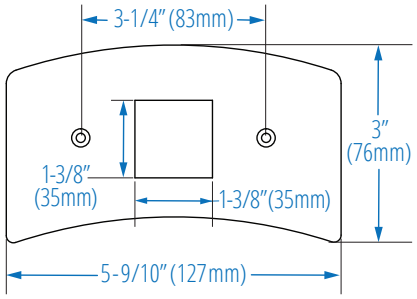
CM-AF500 and CM-AF503 Inserts



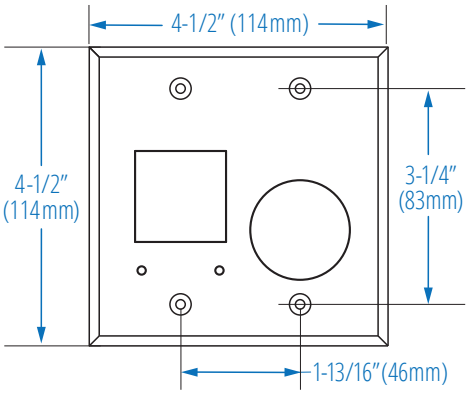
DIMENSIONS



CM-AF500 / CM-AF501SO



CM-AF503



CM-AF540SO / CM-AF550R

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BSI Certified ISO 9001: 2015
FS 541752

Part #: MKTG-LIT-SP-AF500 R9

1600 Series™ Electric Strike

Works with all brands of cylindrical and mortise locksets, with or without a deadbolt

Also available in a Complete One Box Solution

The 1600 Series electric strike accommodates up to a 1" deadbolt with enhanced vertical cavity spacing.

The 1600 Series Electric Strike sets a new standard in the industry by offering dynamic integrated adjustability and field configurable options compatible with any cylindrical or mortise lock. The modular design of the platform makes stocking and installing easier with interchangeable faceplates and accessories. For the first time, the aesthetics of an electric strike are complementary to other surrounding door hardware and blend in with the opening due to the fully finished design, available in eight finishes.

Features

Standard Features

- Stainless steel construction
- Tamper resistant
- Static strength 1,500 lbs
- Dynamic strength 70 ft-lbs
- Endurance 1 million cycles
- Field selectable fail safe/fail secure
- Non-handed
- Interchangeable faceplates and accessories
- Field replaceable components
- Fully finished faceplate, keeper, case and trim
- Field adjustable integrated shim
- Strike body depth 1-5/8" [41.3mm]
- SecuriCare five-year, no-fault, no questions asked warranty

Optional Features

- **LM** Lock monitor
- **DLM** Dual lock monitors
- **LMS** Lock monitor and strike monitor
- **DLMS** Dual lock monitors and strike monitor

Accessories

- **157** Torx screws
- **HESCUT-MTK** Metal template kit
- **1600-104-xxx** Lip extension trim adapter (finish to match)
- **1600-106-xxx** 1006 adapter and trim enhancer kit (finish to match)
- **OPT-1SRK** Spring replacement kit
- **OPT-1LM** Single lock monitor
- **OPT-1DLM** Dual lock monitors
- **MOD-1SOL** Solenoid replacement module

For easy 3D instructions, download the BILT mobile app

BILT

CERTIFIED

UL CERTIFIED

Grade 1 | SecuriCare 5 Year Warranty | Mortise Locks with Deadbolt | Mortise Locks without Deadbolt | Cylindrical Locksets | Field Selectable (Fail secure /Fail safe) | Dual Voltage 12/24 | PoE Friendly | Fire Rated | Windstorm Resistant | Outdoor Rated | Burglary Rated

Specifications

Certifications

- ANSI/BHMA A156.31, Grade 1
- UL 1034 burglary-resistant listed and suitable for outdoor use
- UL 294 listed
- RoHS compliant
- UL 10C fire rated, 3-hour single door (fail secure only)
- UL 10C fire rated, 1-1/2 hour double door (fail secure only)
- CAN/ULC-S104 fire door conformant
- NFPA-252 fire door compliant
- ASTM-E152 fire door compliant
- California Fire Marshal listed
- ANSI/SDI A250.13 windstorm resistant
- Florida Building Code approved TAS 201, 202, 203
- ANSI-ASTM E330

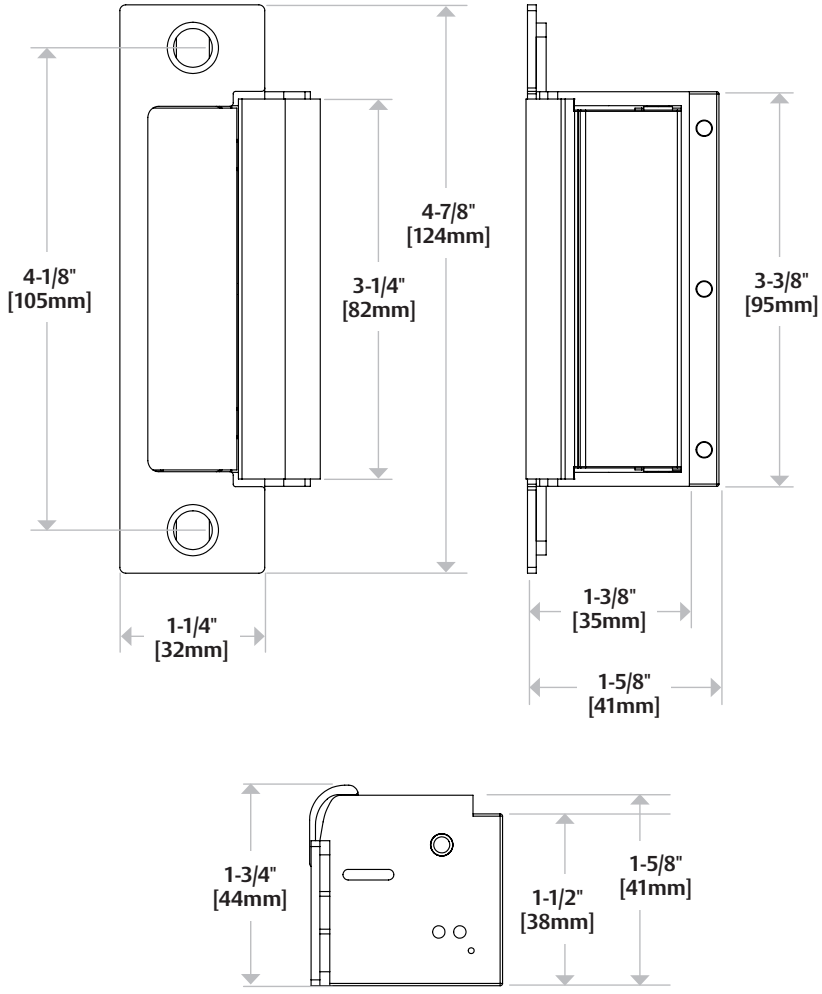
Frame Application

- Metal
- Wood

Electrical (DC Continous Duty)

- Dual voltage 12/24 VDC/VAC
- 240 mA at 12 VDC/120 mA at 24 VDC
- PoE friendly

Dimensions



How to Order

SERIES	MODEL	FINISH*	OPTION (S)
1600	– CS	– 630	– LM
1600 Universal Electric Strike	**(blank)** Electric strike body only, faceplates ordered separately	**605** Bright Brass	**(blank)** No Monitor
	CS* Complete Electric Strike; includes 1LB faceplate kit for latchbolts and 1DB faceplate kit for deadbolts	**606** Satin Brass	**LM** Lock Monitor
		612 Satin Bronze	**DLM** Dual Lock Monitor
		613 Bronze Toned	**LMS** Lock Monitor and Strike Monitor
		613E Dark Oxidized Satin Bronze Powder	
	CLB* Complete Electric Strike for Latchbolt Locks; includes 1LB faceplate kit for latchbolts	**629** Bright Stainless Steel	**DLMS** Dual Lock Monitors and Strike Monitor
		630 Satin Stainless Steel	
	CDB* Complete Electric Strike for Deadbolt Locks; includes 1DB faceplate kit for deadbolts	**BSP** Black Suede Powder	

**Complete Pacs are only available in the 630 finish*

NOTE: Electric strike compatibility is determined at time of electric strike product release. ASSA ABLOY is not responsible for incompatibility of products that have changed in design or craftsmanship by their respective manufacturers. When compatibility is a concern, contact Customer Support for application assistance.

Updated 7/31/23 Patent pending and/or patent www.assaabloydss.com/patents

232W

Convex Wall Stop

Notes:

- Specify 232T for machine screw and toggle nut screw pack (10 pk)
- BL232W is 232W case quantity 50
- Concealed tamper proof mounting
- Easy installation by inserting screwdriver through small hole in bumper

PRODUCT SPECIFICATIONS

CERTIFICATIONS:
- Meets ANSI A156.16 for L02101

DIAMETER:
- 2-7/16" (62 mm)

PROJECTION:
- 1" (25 mm)

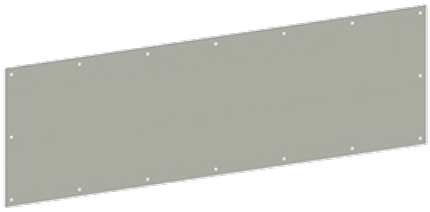
MATERIALS:
- Wrought brass, bronze, stainless steel with grey rubber bumper

FINISHES:
- US3, US4, US5, US9, US10, US10B, US15, US15A, US19, US26, US26D, US32, US32D

FASTENERS:
- One (1) #10 x 1-1/2" PPHWS with plastic and toggle anchor

190S

Door Protection Plate
0.050" gauge with four beveled edges



NFPA Notes:

- NFPA 80 Standards
- 6.4.5 Protection Plates 6.4.5.1
- Factory installed protection plates shall be installed in accordance with the listing of the door. 6.4.5.2
- Field installed protection plates shall be labeled and installed in accordance with their listing. 6.4.5.3
- Labeling shall not be required where the top of the protection plate is not more than 16" (406mm) above the bottom of the door.
- Note: If needing the 190S with rounded corners, please order the 196R.

PRODUCT SPECIFICATIONS

GAUGE:
- 0.050" (1 mm)

MATERIALS:
- Aluminum, Brass, Bronze, Stainless Steel

FINISHES:
- US3, US4, US10, US10B, DBZ, US28, US32, US32D

BEVEL:
- 4 edges

ORDER:
- Furnish item #, height, width, and finish (i.e., 190S – 6" x 30", US32D).
- Plates are sized on even inches. Odd size available and priced to next larger size.
- May be ordered with countersunk holes (specify "CSK") at extra charge.

OPTIONS:
- UL listed for US32 and US32D with screw fasteners (must specify UL stamp)
- Self-adhesive tape available on all plates
- Spanner head screws
- Torx head screws
- Round corners - specify 196R
- Wrap around side and bottom return
- 0.125" material

CERTIFICATION:
- Meets ANSI A156.6 for J101 Metal Armor Plate, J102 Metal Kickplate, and J103 Metal Mop Plate

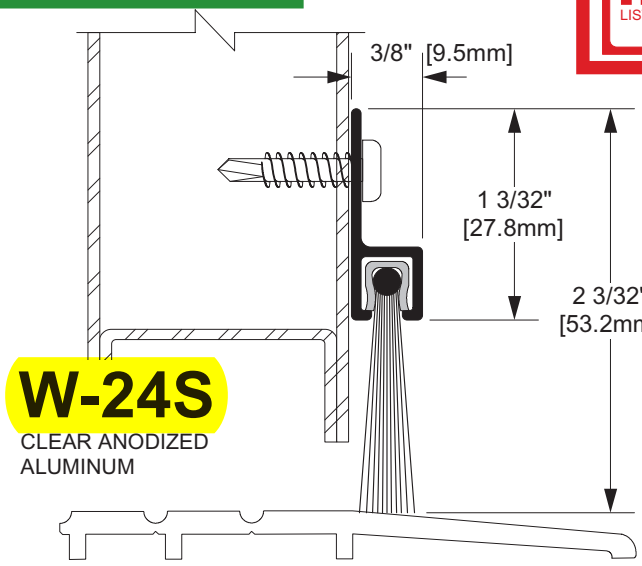
EPD:
- Door Protection Plates Environmental Product Declaration

PRODUCT SIZE OPTIONS

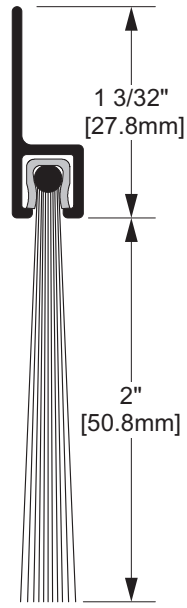
ITEM #	B&S GAUGE	US GAUGE	BEVEL	FASTENERS	QUANTITY BAG	QUANTITY CASE
190S	16	18	B4E	#6 x 5/8 truss head screws	1 each	- - -
196R	16	18	none	#6 x 5/8 truss head screws	1 each	- - -
198S	- - -	20	none	#6 x 5/8 truss head screws	1 each	- - -
199B	- - -	20	none	#6 x 5/8 truss head screws	1 each	- - -
220S	14	16	B4E	#6 x 5/8 truss head screws	1 each	- - -

SWEEPS

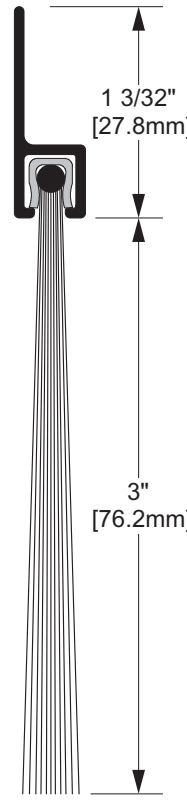
ALL PRODUCTS ON THIS PAGE



W-24S
CLEAR ANODIZED ALUMINUM



W-33S
CLEAR ANODIZED ALUMINUM



W-34S
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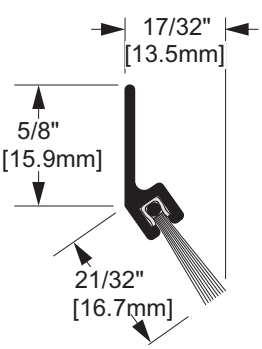

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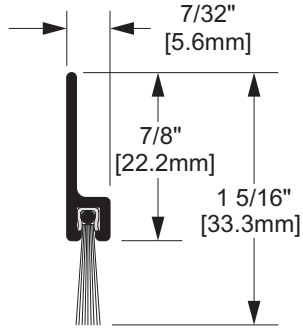
CLEAR ANODIZED ALUMINUM



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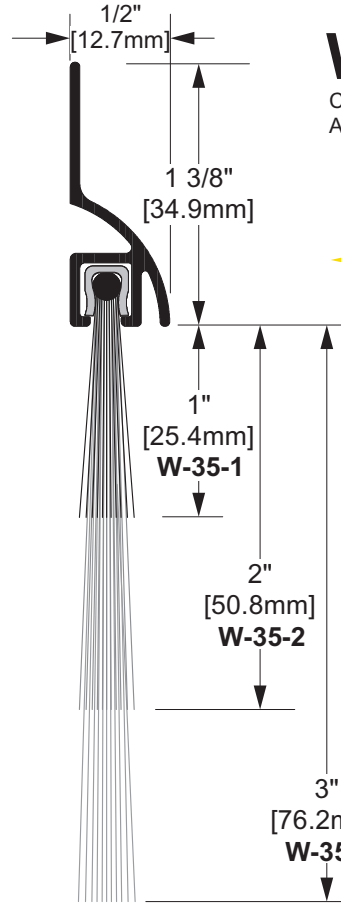
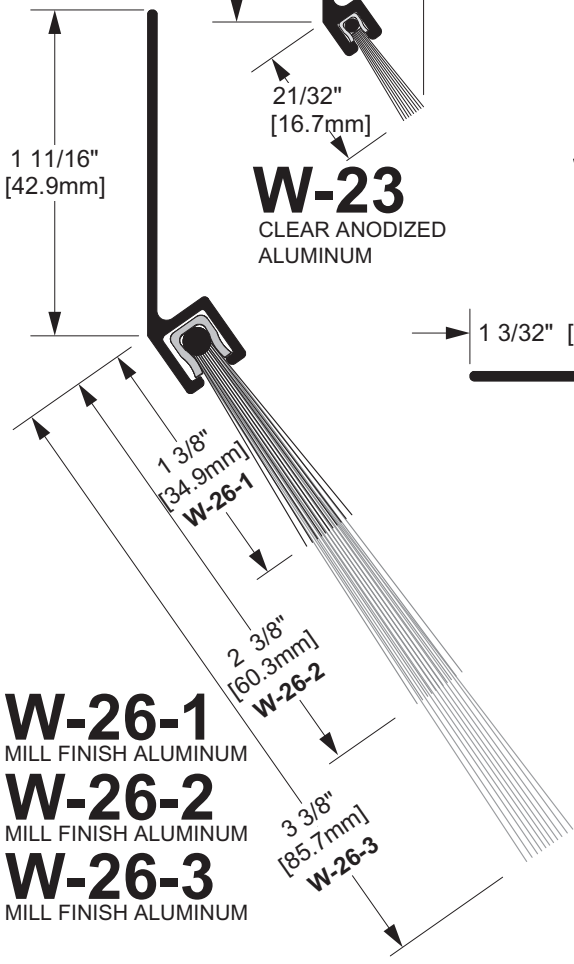


NEW

W-35-1
CLEAR ANODIZED ALUMINUM

W-35-2
CLEAR ANODIZED ALUMINUM

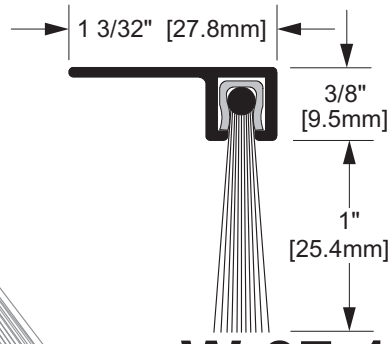
W-35-3
CLEAR ANODIZED ALUMINUM



W-26-1
MILL FINISH ALUMINUM

W-26-2
MILL FINISH ALUMINUM

W-26-3
MILL FINISH ALUMINUM



W-37-1
CLEAR ANODIZED ALUMINUM

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 80 05 Glazing

1.3 References

.1 National Fire Protection Association (NFPA)
  .1 NFPA 80 - 2022 Standard for Fire Doors and Other Opening Protectives
  .2 NFPA 252 - 2022 Standard Methods of Fire Tests of Door Assemblies.
  .3 NFPA 257 - 2022 Standard on Fire Test for Window and Glass Block Assemblies.
.2 Underwriters Laboratories, Inc. (UL)
  .1 UL 9 Fire Tests of Window Assemblies.
  .2 UL 10B for Fire Tests of Door Assemblies.
  .3 UL 10C Positive Pressure Fire Tests of Door Assemblies.
.3 Underwriters Laboratories of Canada (ULC)
  .1 CAN/ULC S104-15 Standard Method for Fire Tests of Door Assemblies
  .2 CAN/ULC S106-15 Standard Method for Fire Tests of Window and Glass Block Assemblies
.4 Consumer Products Safety Commission (CPSC)
  .1 CPSC 16 CFR 1201 Safety Standard for Architectural Glazing Materials.
.5 Glass Association of North America (GANA)
  .1 GANA – Glazing Manual
  .2 FGMA – Sealant Manual

1.4 Submittals

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

.2 Shop Drawings: Submit shop drawings showing layout, profiles and product components.

.3 Samples: Submit 150 x 150 mm glass samples.

.4 Product Data: Submit latest edition of manufacturer's product data.

.5 Provide maintenance data for fire resistant glazing for incorporation into Operation and Maintenance Manual specified in Section 01 78 00 – Closeout Submittals.

1.5 System Description

.1 Performance Requirements: Provide a fire rating glazing manufactured, fabricated and installed to maintain performance criteria stated by manufacturer without defects, damage or failure.
  .1 Fire Rating: Fire resistant glazing shall be fire rated from 20-180 minutes with hose stream and is impact safety rated to meet CPSC 16 CFR 1201 Category I and II.
  .2 Fire resistant glazing shall be tested in accordance with NFPA 80, NFPA 252, NFPA 257, UL 9, UL 10B, UL 10C, ULC 104 and ULC 106.

.3 Testing Laboratory: Fire test shall be conducted by a nationally recognized independent testing laboratory.

.2 Listings and Labels: Fire rated glazing shall be under current follow-up service by a nationally recognized independent testing laboratory approved by OSHA and maintain a current listing or certification. Assemblies shall be labeled in accordance with limits of listings.

1.6 Project Conditions

.1 Field Measurements: Verify actual measurements for openings by field measurements before fabrication. Show recorded measurements on shop drawings. Coordinate field measurements and fabrication schedule with construction progress to avoid construction delays.

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.

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 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 Fire Rated Glazing

.1 Material:
- .1 Fire protective impact safety rated laminated glass ceramic with hose stream, fire rating as indicated.
- .2 Conforming to CAN/ULC S104 and CAN/ULC S106

.2 Product and Manufacturer:
- .1 PYRAN Platinum L as manufactured by SCHOTT Technical Glass Solutions
- .2 Keralite Select L as manufactured by VETROTECH SAINT-GOBAIN NORTH AMERICA INC
- .3 Firelite Plus Premium as manufactured by Nippon Glass.

.3 Design Requirements:
- .1 Thickness: 8 mm thick.
- .2 Weight: 19.5 kg/m^2
- .3 Sound Transmission Rating: 36 STC.
- .4 Appearance: Neutral colouration free of amber tints.
- .5 Fire Rating: Fire rated from 20-180 minutes with hose stream.
- .6 Impact Safety Rating: Meet CPSC 16 CFR 1201 Category I & II.
- .7 Cradle to Cradle Certification: Must be C2C Silver Certified.
- .8 Polished finish.
- .9 ANZI Z97 Impact Safety Filmed and Laminated

.10 Environmental Impact: Manufacturing process and final composition free from toxins or hazardous heavy metals.

.4 Each piece of fire-rated glazing material shall be labeled with a permanent logo including name of product, manufacturer, testing laboratory and fire rating.

2.2 Accessories

.1 Glazing Accessories: Manufacturer recommended fire rated glazing accessories as follows:
.1 Glazing tape: Closed cell polyvinyl chloride (PVC) foam, Pemko Manufacturing Company, FG3000S90 or Unifax Corporation Fiberfrax Alumino-Silicate fiber glazing tape.
.2 Setting blocks: Calcium silicate or hardwood.
.3 Cleaners, primers, sealers: Type recommended by manufacturer of glass and gaskets.

2.3 Related Products

.1 Glazing shall be installed in an equally rated framing system.

2.4 Source Quality

.1 Obtain fire rated glazing products from a single manufacturer.

.2 Fabrication Dimensions: Fabricate to required dimensions.

PART 3 EXECUTION

3.1 Manufacturer's Instructions

.1 Comply with manufacturer's product data including product technical bulletins and installation instructions.

3.2 Examination

.1 Verify substrate conditions, have been previously installed under other sections, and are acceptable for product installation in accordance with manufacturer's instructions.

3.3 Installation

.1 Comply with referenced GANA manuals and instructions of manufacturers of glass, glazing sealants and glazing compounds.

.2 Protect glass from edge damage during handling and installation. Inspect glass during installation and set aside pieces with edge damage that could affect performance.

.3 Set units of glass in each series with uniformity of pattern, draw, bow and similar characteristics.

.4 Cut glazing tape to length and set against permanent stops, flush with sight lines to fit openings exactly, with stretch allowance during installation.

.5 Arrange two setting blocks located at quarter points of glass with edge block no more than 150 mm from corners.

.6 Glaze vertically into labeled fire rated frames or fire rated walls with the same fire rating as the glass and push against tape for full contact at perimeter of pane or unit.

.7 Place glazing tape on free perimeter of glazing in same manner described above.

.8 Install removable stop and secure without displacing the tape.

.9 Install so that appropriate markings remain permanently visible.

.10 Field cutting or tampering is strictly prohibited.

3.4 Cleaning

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

.2 Protect glass from contact with contaminating substances resulting from construction operations. Remove such substances by method approved by manufacturer.

.3 Wash glass on both faces not more than four days prior to date schedule for inspections intended to establish date of Substantial Performance. Wash glass by method recommended by glass manufacturer.

.4 Remove temporary coverings and protection of adjacent work areas.

.5 Remove construction debris from project site and legally dispose of debris.

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 07 92 00 Joint Sealants
.3 Section 09 22 16 Non-Structural Metal Framing
.4 Section 09 91 23 Interior Painting

1.3 References

.1 ASTM International (ASTM)
  .1 ASTM C514-04(2020) Standard Specification for Nails for the Application of Gypsum Board
  .2 ASTM C840-20 Standard Specification for Application and Finishing of Gypsum Board
  .3 ASTM C954-22 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 C1002-22 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 C1047-19 Standard Specification for Accessories for Gypsum Wallboard and Gypsum Veneer Base
  .6 ASTM C1396/C1396M - 17 Standard Specification for Gypsum Board
  .7 ASTM C1629/C1629M-19 Standard Classification for Abuse-Resistant Nondecorated Interior Gypsum Panel Products and Fiber-Reinforced Cement Panels
  .8 ASTM E90-09(2016) Standard Test Method for Laboratory Measurement of Airborne Sound Transmission Loss of Building Partitions and Elements
  .9 ASTM E814-13a(2017) Standard Test Method for Fire Tests of Penetration Firestop Systems
  .10 ASTM E1966-15(2019) Standard Test Method for Fire-Resistive Joint Systems
.2 Canadian General Standards Board (CGSB)
  .1 CAN/CGSB-51.34 Vapour Barrier, Polyethylene Sheet for Use in Building Construction.
  .2 CAN/CGSB 19-GP-21M Sealing and Bedding Compound for Acoustical Purposes
.3 Underwriters Laboratories of Canada (ULC)
  .1 ULC 102-2018 Standard Method of Test for Surface Burning Characteristics of Building Materials and Assemblies.
  .2 ULC 114-2018 Standard Method of Test for Determination of Non-Combustibility in Building Materials
  .3 ULC 129- 2015 Standard Method of Test for Smoulder Resistance of Insulation (Basket Method)
  .4 ULC List of Equipment and Material, Volume III, Fire Resistance Ratings.
.4 Gypsum Association (GA)
  .1 GA-214-2022 Recommended Levels of Gypsum Board Finish.
  .2 GA-216-2021 Application and Finishing of Gypsum Board.
.5 Wall and Ceiling Bureau
  .1 Technical Bulletin Control Joint Placement in Gypsum Board Assemblies

1.4 Submittals

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

.2 Product Data:
.1 Submit manufacturer's instructions, printed product literature and data sheets for gypsum board assemblies and include product characteristics, performance criteria, physical size, finish and limitations.

1.5 Quality Assurance

.1 Dry wall installers: minimum 5 years proven experience.

.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.

.4 Pre-Installation Meetings: conduct pre-installation meeting to verify project requirements, manufacturer's installation instructions and manufacturer's warranty requirements.

.5 Mock-Ups
.1 Construct mock-ups in accordance with Section 01 45 00 - Quality Control.
.2 Construct mock-up gypsum board wall installation including one inside corner and one outside corner. Mock-up may be part of finished work.
.3 Allow two working days for inspection of mock-up by Consultant before proceeding with rest of the work.
.4 When accepted, mock-up will demonstrate minimum standard for this work. Mock-up may remain as part of finished work.

1.6 Design Requirements

.1 Where indicated provide minimum sound transmission rating of installed partitions of STC 50 tested to ASTM E90.

.2 Provide fire resistance rating of installed partitions as indicated and according to referenced ULC design.

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 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.

1.8 Project Conditions

.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.

.3 Ventilation: Ventilate building spaces as required to remove excess moisture that would prevent drying of joint treatment material immediately after its application.

1.9 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 ASTM C1396 Heavy Duty Abuse Resistant for non-rated applications, Type X for rated applications, 1220 mm wide x maximum practical length, ends square cut, edges tapered with round edge. Thickness as indicated on drawings.

.2 Water and Moisture Resistant Board: to ASTM C1396, thickness as indicated, 1220 mm wide with tapered edges.

2.2 Fastening and Adhesives

.1 Drywall Screws: To ASTM C954 or ASTM C1002 self-drilling, self-tapping, case hardened, length to suit board thickness and provide minimum 12 mm penetration into support.

.2 Joint Tape: To ASTM C475, 50 mm perforated with preformed seam, mould and mildew resistant.
.1 Joint tape for abuse resistant gypsum board: CGC Mould Resistant Fiberglass Drywall Tape.

.3 Joint Filler and Topping: To ASTM C475 vinyl or latex base, slow setting.

2.3 Acoustic Insulation

.1 Acoustic Attenuation: Min 50 STC in accordance with ASTM E90.

.2 Acoustic Insulation: Mineral or Glass Fibre Acoustic Insulation:
.1 Mineral Fibre Acoustic Insulation: To ASTM C665, Mineral fibre blanket insulation, minimum density of 40 kg/m^3:
.1 AFB Acoustical Fire Batts manufactured by Roxul Inc.
.2 Creased SAFB manufactured by Owens Corning Canada.
.2 Glass Fibre Acoustic Blanket Insulation: To CAN/ULC-S702, type 1, pre-formed unfaced glass fibre batt acoustic insulation.
.1 QUIETZONE Acoustic Blanket insulation manufactured by Owens Corning Canada.

.3 Surface burning characteristics to ULC 102:
.1 Flame spread: 15
.2 Smoke developed: 5
.3 Smoulder resistance: to ULC 129.
.4 Non-combustible: to ULC 114

.4 Thickness to suit depth of wall framing and as indicated.

.5 Acoustic sealant: as specified in Section 07 92 00 - Joint Sealants.

2.4 Accessories

.1 Casing beads, corner beads, control joints and edge trim: to ASTM C1047, zinc-coated by hot-dip process 0.5 mm base thickness, 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.

.3 Sealants: as specified in Section 07 92 00 - Joint Sealants.

PART 3 EXECUTION

3.1 General

.1 Prior to installation of gypsum wallboard, ensure that all required vapour barriers, air seals, gaskets and the like installed under another Section have been inspected and accepted by Municipal authorities and the Consultant. Failure to do so will result in removal of all gypsum board installed prior to approval and replacement, at no additional cost to the Owner.

.2 Unless otherwise indicated on the drawings, all gypsum board partitions shall extend from floor level to the underside of floor or roof structures above.

3.2 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.

3.3 Gypsum Board Application

.1 Do not apply drywall to reinforced partitions until plywood backing specified in section 06 10 00 is installed and accepted by the Consultant.

.2 Do application and finishing of gypsum board in accordance with ASTM C840 and/or GA-216 except where specified otherwise.

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

.4 Apply gypsum board at right angles to framing members or furring using screw fasteners. Maximum spacing of screws 300 mm o.c.

.5 Install fibre gypsum abuse resistant panels at all ceilings and bulkheads except as noted below. Treat joints with fibreglass reinforced joint tape in accordance with manufacturer's instructions.

.6 Apply moisture resistant gypsum wallboard where indicated. Apply water resistant sealant to edges, ends and cut outs which expose gypsum core.

.7 Carry gypsum board from floor to underside of floor or roof structure above. Furr out and carry gypsum board around any structural members as may be required. Neatly cope gypsum board to fill deck flutes where gypsum board abuts floor or roof deck.

3.4 Accessories

.1 Erect accessories straight, plumb or level, rigid and at proper plane. Use full length pieces where practical. Make joints tight, accurately aligned and rigidly secured. Mitre and fit corners accurately, free from rough edges.

.2 Install casing beads where gypsum board butts against surfaces having no trim concealing junction and where indicated.

.3 Install insulating strips continuously at edges of gypsum board or casing beads abutting exterior door or window frames, to provide thermal break.

.4 Install continuous bead of acoustic sealant at all penetrations through sound control partitions.

.5 Provide control joints in gypsum board facing. Construct control joints in accordance with ASTM C840 and as described in Wall and Ceiling Bureau Technical Bulletin "Control Joint Placement in Gypsum Board Assemblies". Place control joints consistent with lines of building spaces as indicated. Where not indicated install as directed at maximum 6.0 m spacing. Control joints shall be supported with metal studs or furring channels on both sides of the joint Construct joints using back-to-back casing beads filled with a low modulus sealant capable of flexible joint movement. Maintain fire-resistance rating of wall assemblies. Control joints shall be provided:
.1 At abutting structural elements, steel columns.
.2 At expansion or control joints in the substrate.
.3 At each door jamb.

3.5 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.

3.6 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. Finish to GA-214 Level 5.

.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.

3.7 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 09 21 16 Gypsum Board

1.3 References

.1 ASTM International (ASTM).
- .1 ASTM A653/A653M-23 Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process
- .2 ASTM C645-18 Standard Specification for Nonstructural Steel Framing Members
- .3 ASTM C754-20 Standard Specification for Installation of Steel Framing Members to Receive Screw-Attached Gypsum Panel Products
- .4 ASTM C841-03(2018) Standard Specification for Installation of Interior Lathing and Furring.
- .5 ASTM C1002-22 Standard Specification for Steel Self-Piercing Tapping Screws for Application of Gypsum Panel Products or Metal Plaster Bases to Wood Studs or Steel Studs
- .6 ASTM E90-09(2016) Standard Test Method for Laboratory Measurement of Airborne Sound Transmission Loss of Building Partitions and Elements
- .7 ASTM E814-13a(2017) Standard Test Method for Fire Tests of Penetration Firestop Systems
- .8 ASTM E1966-15(2019) Standard Test Method for Fire-Resistive Joint Systems

.2 Canadian General Services 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 Product Data:
- .1 Submit manufacturer's instructions, printed product literature and data sheets for metal framing and include product characteristics, performance criteria, physical size, finish and limitations.

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.

PART 2 PRODUCTS

2.1 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 Thickness of materials to conform to referenced standards unless noted otherwise.
  .2 Thickness of materials shall be selected from manufacturer's standard span tables to suit total height requirements.

.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.

.5 Wind bearing light weight steel stud framing for exterior wall applications is specified in Section 05 41 00.

2.2 Metal Furring and Suspension Systems

.1 Channel 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.
  .1 Thickness of materials to conform to referenced standards unless noted otherwise.

.1 Metal Furring Runners, Hangers, Tie Wires, Inserts, Anchors: to ASTM C645 , 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 Deflection Track: Bailey Multi-Slot Track MST 250, size to suit studs, and top deflection clips TDC 350 and TDC 587.

.5 Horizontal Flange attachment: Bailey Horizontal Flange Attachment Clip (HFA Clip)

.6 Hangers: minimum 4.1 mm diameter (or as required by ULC fire rating design requirements) mild steel rods.

2.2 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 ASTM C1002, self-drilling, self-tapping, case hardened, length to suit board thickness and provide minimum 12 mm penetration into support.

2.3 Accessories

.1 Acoustic sealant: As specified in Section 07 92 00.

.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.

PART 3 EXECUTION

3.1 Examination

.1 Verification of Conditions: verify that conditions of substrate previously installed under other Sections or Contracts are acceptable for non-structural metal framing application in accordance with manufacturer's written instructions.
  .1 Visually inspect substrate in presence of Consultant.
  .2 Inform Consultant of unacceptable conditions immediately upon discovery.
  .3 Proceed with installation only after unacceptable conditions have been remedied [and after receipt of written approval to proceed from Consultant.

3.2 Erection

.1 Comply with ASTM C754.

.2 All gypsum board shall be supported with steel framing whether indicated or not.

.3 Unless otherwise indicated on the drawings, all gypsum board partitions shall extend from floor level to the underside of floor or roof structures above.

.4 Align partition tracks at floor and ceiling and secure at 600 mm on centre maximum. Provide top deflection tracks where indicated or as required to permit structural deflection. Install top deflection clips as necessary to increase load capacity.

.5 Install damp proof course under stud shoe tracks of partitions on slabs on grade.

.6 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.

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

.8 Attach studs to bottom and ceiling track using screws.

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

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

.11 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.

.12 Install heavy thickness single jamb studs at openings.

.13 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.

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

.15 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.

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

.17 Maintain clearance under beams and structural slabs to avoid transmission of structural loads to studs. Use 50 mm leg ceiling tracks.

.18 Erect drywall resilient furring transversely across studs and joists, spaced maximum 600 mm on centre and not more than 150 mm from ceiling/wall juncture. Secure to each support with 25 mm drywall screws.

.19 Install 150 mm continuous strip of 12.7 mm gypsum board along base of partitions where resilient furring installed

.20 Install continuous insulating strips to isolate studs from un-insulated surfaces.

.21 Install two continuous beads of acoustical sealant under studs and tracks around perimeter of sound control partitions.

3.3 Wall Furring

.1 Install wall furring for gypsum board wall finishes in accordance ASTM C754 and ASTM C841 except where specified otherwise and indicated 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.

3.4 Suspended and Furred Ceilings and Bulkheads

.1 Erect hanger and runner channels for suspended gypsum board ceilings and bulkheads in accordance with ASTM C754 and ASTM C841 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 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.

3.5 Gypsum Board

.1 Installation of gypsum board is specified in Section 09 21 16

3.6 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 07 92 00 Joint Sealants

1.3 References

.1 ASTM International (ASTM)
  .1 ACTM C144-18 Standard Specification for Aggregate for Masonry Mortar
  .2 ASTM C150/C150M-22 Standard Specification for Portland Cement
.2 American National Standards Institute (ANSI)
  .1 ANSI A108/A118/A136.1:2017 American National Specifications for the Installation of Ceramic Tile.
  .2 ANSI A137.1: 2017 American National Standard Specifications for Ceramic Tile
.3 Canadian General Standards Board (CGSB)
  .1 CGSB 71-GP 22M 1978 Adhesive, Organic, for Installation of Ceramic Wall Tile
.4 International Standards Organization (ISO)
  .1 ISO 10545 Series Ceramic Tiles, Standards for Testing
  .2 ISO 13006-2012 Ceramic Tiles, Definitions, Classifications, Characteristics and Marking.
  .3 ISO 13007-2010 Ceramic Tiles, Grouts and Adhesives.
.5 Terrazzo, Tile and Marble Association of Canada (TTMAC)
  .1 TTMAC 2019-2021 Specifications Guide 09 30 00, Tile Installation Manual.

1.4 Submittals

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

.2 Provide product data. Include manufacturer's information on:
  .1 Ceramic tile, marked to show each type, size, and shape required.
  .2 Mortar and grout.
  .3 Divider strip.
  .4 Levelling compound.
  .5 Waterproofing isolation membrane.

.3 Submit duplicate samples of tile. 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.

.4 Trim and Accessories: submit duplicate samples of each trim.

.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 installation of ceramic tile, use only skilled tradesmen who are familiar with the referenced standards and with the requirements for this Work.

.3 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.

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 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 Project 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.

.2 Do not install tiles at temperatures less than 12 °C or above 38 °C.

.3 Do not apply epoxy mortar and grouts at temperatures below 15 °C or above 25 °C.

.4 Provide and maintain temporary lighting. Lighting levels shall be sufficient to complete work including inspections. Provide minimum lighting levels of 400 lux at work areas.

1.8 Qualifications

.1 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.

1.9 Waste Management and Disposal

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

1.10 Maintenance

.1 Upon completion of the installation and as a condition of acceptance, deliver to the Owner 2% 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.

1.11 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 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 colours shall be selected by the Consultant from the manufacturer's standard range of colours.

.3 Tile shall conform to ANSI A137.1.

.4 Provide coves, corners, reveals, surf caps, inners and outers as required to complete the work.

2.2 Ceramic Tile

.1 CT: Ceramic Wall Tile: Daltile (American Olean) Color Story Wall 4" x 16" Glossy. Up to 10 colours to be
  .1 CT1: Ice White 0025
  .2 CT2: Wisdom 0082
  .3 CT3: Green Apple 0076
  .4 CT4: Fresh 0031

.2 Wall base for Terrazzo gypsum wall areas: Provide surface bullnose top cove S44D9/4" x 16" where indicated.

.3 Alternate pricing PCT1 Corridor Tile: Centura Basaltina 12"x24" Matte Light Grey
  .1 Provide Satin Anodized Finish wall corner edge flat provide protection for Centura Basaltina 12"x4" Wall base

2.3 Mortar, Adhesives and Grout Material

.1 Primer: Low VOC, low viscosity primer as recommended by manufacturer to suit substrate and site conditions; provide proof of bonding ability of setting systems where manufacturer recommends that a primer is not necessary to installation.

.2 Surface Preparation Materials:
  .1 Portland Cement Mortar: Scratch and bond coat, levelling bed containing the following:
    .1 Portland Cement: Meeting or exceeding requirements of CSA A3000, Type GU.
    .2 Hydrated Lime: Meeting or exceeding requirements of ASTM C207, Type N.
    .3 Sand: Meeting or exceeding requirements of ASTM C144, passing 16 mesh.
    .4 Water: Potable.
  .2 Self Levelling and Smoothing Underlayment: Cementitious and self levelling smoothing underlayment meeting or exceeding requirements of ANSI A108.1, Type 2.

.3 Wall Tile Systems:
  .1 Thin Set Interior Installation: Dry set mortar meeting or exceeding requirements of ANSI A118.1 formulated for thin set applications, factory sanded mortar consisting of Portland

cement, sand and additives requiring only addition of potable water for installation complete with bond enhancing latex additive.

.4 Adhesive Systems:
.1 Epoxy Adhesive: Thin set adhesive system using 100% solids epoxy resin and epoxy hardener meeting or exceeding requirements of ANSI A108.1; stain proof, chemical resistant and having high temperature resistance and water cleanable.

.5 Tile Grout Systems:
.1 Stain and mould resistant grout meeting or exceeding requirements of ANSI A118.7. TEC Power Grout or Profix Alpha High Performance Grout.

2.4 Accessories

.1 Reducers, edge trim, and transition strips: Schluter Systems purpose made aluminum.

.2 CT Edge Protection: Schluter RONDEC, size to suit tile thickness. Satin anodized aluminum. Trim to come with all connectors or end caps required for a complete and finished installation. As a minimum, provide edge protection at the following locations:
.1 All outside corners of wall tile or porcelain ceramic tile base.

.3 Sealant: as specified in Section 07 92 00.

2.5 Mixes

.1 Mix premanufactured mortars and grouts in accordance with referenced standards, and mortar and grout manufacturer's written instructions; mix site mixed materials as follows:
.1 Scratch Coat (by volume): Mix 1 part Portland cement, 4 parts sand, and latex additive where required by TTMAC detail.

PART 3 EXECUTION

3.1 Surface Conditions

.1 Surfaces on which tile is to be applied, shall be thoroughly cleaned down.

.2 Verify that concrete substrates have been allowed to cure for a minimum of 28 days in accordance with TTMAC requirements.

.3 Verify that substrates for bonding tile are firm; dry; clean; free from oil, waxy films, and curing compounds; and are within starting flatness tolerances as specified in Section 03 30 00, and are ready for application of levelling materials specified in this Section.

.4 Verify that installation of grounds, anchors, recessed frames, electrical and mechanical units of Work, and similar items located in or behind tile have been completed before installing tile.

.5 Drywall surfaces on which wall tile is to be applied, shall be free from dust, excess plaster and shall be plain and true without any irregularities. Prepare existing gypsum board surfaces as recommended by TTMAC and product manufacturer to support tile installation.
.6 Existing painted masonry or concrete 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 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.

.9 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.

.10 Install transition strips, reducers and edge trim at exposed edges of all tiled walls in accordance with manufacturer's instructions.

3.2 Installation

.1 Install tiling in accordance with requirements of TTMAC Tile Installation Manual and parts of ANSI A108 Series of tile installation standards that apply to types of bonding and grouting materials, and to methods required for complete tile installation.

.2 Extend tile work into recesses and under or behind equipment and fixtures to form a complete covering without interruptions:
- .1 Terminate Work neatly at obstructions, edges, and corners without disrupting pattern or joint alignments.
- .2 Make cut edges smooth, even and free from chipping.
- .3 Do not split tile.

.3 Accurately form intersections and returns; perform cutting and drilling of tile without marring visible surfaces:
- .1 Cut, drill, and fit tile to accommodate work of other subcontractors penetrating or abutting work of this Section.
- .2 Carefully grind cut edges of tile abutting trim, finish, or built in items for straight aligned joints.
- .3 Fit tile closely to electrical outlets, piping, fixtures, and other penetrations so that plates, collars, or covers overlap tile and to provide a uniform joint appearance.

.4 Lay tile in pattern indicated on Drawings and as follows:
- .1 Centre tile patterns between control and movement joints; notify Consultant for further instructions where tile patterns do not align with control or movement joints.
- .2 Cut tile accurately and without damage.
- .3 Smooth exposed cut edges with abrasive stone, where exposed.
- .4 Chipped or split edges are not acceptable.

.5 Bonding Bed: Set tile in place while bond coat is wet and tacky and as follows:
- .1 Adjust amount of bonding materials placed on substrates based on temperature and humidity to prevent skinning over of bonding materials.
- .2 Use sufficient bond coat to provide a minimum 80% contact for tiles smaller than 300 mm x 300 mm with bonding material evenly dispersed and pressed into back of tile; refer to back buttering requirements for larger materials and installations having Moderate or higher Load Bearing Performance requirements.
- .3 Notch bond coat in horizontal straight lines and set on freshly placed bonding material while moving (sliding) tile back and forth at 90° to notches.
- .4 Verify that corner and edges are fully supported by bonding material.
- .5 Set tiles to prevent lippage greater than 1 mm over a 3 mm grout joint.
- .6 Keep two-thirds of grout joint depth free of bonding materials.

.7 Clean excess bonding materials from tile surface prior to final set.
.8 Sound tiles after bonding materials have cured and replace hollow sounding tile before grouting.

.6 Back Buttering: Obtain 100% mortar coverage in accordance with applicable requirements for back buttering of tile in referenced TTMAC and ANSI A108 series of tile installation standards

.7 Control and Movement Joints: Install control joints and expansion joints in tile work in accordance with TTMAC Detail 301MJ; keep control and expansion joints free of bonding materials and as follows:
.1 Cut tiles to establish line of joints; sawn joints after installation of tiles will not be acceptable.
.2 Install prefabricated joint profiles in accordance with manufacturer's written instructions, set with top surface of joint profile slightly below top surface of tile.
.3 Prepare joints and apply sealants in accordance with requirements of Section 07 92 00.
.4 Keep control and movement joints free from setting materials.
.5 Form an open joint for sealant in tile wherever a change in backing material occurs, at all vertical interior corners, around penetrating pipes and fixtures, and where tile abuts other materials or fixtures.

3.3 Grouting

.1 Grouting: Install grout in accordance with manufacturer's written instructions, the requirements of TTMAC, and as follows:
.1 Allow proper setting time before application of grout.
.2 Pre-seal or wax tiles requiring protection from grout staining.
.3 Force grout into joints to a smooth, dense finish.
.4 Remove excess grout in accordance with manufacturer's written instructions and polish tile with clean cloths.

.2 Grout all tile using specified grout in strict accordance with manufacturers written instructions all to give a flush, hard joint.

.3 Joints in 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 Cleaning and Protection

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

.2 Cleaning: Clean tile surfaces so they are free of foreign matter using manufacturer recommended cleaning products and methods after completion of placement and grouting and as follows:
.1 Remove grout residue from tile as soon as possible.
.2 Flush surface with clean water before and after cleaning.

.3 Protection: Leave finished installation clean and free of cracked, chipped, broken, unbonded, or other tile deficiencies as follows:
.1 Protect finished areas from traffic until setting materials have sufficiently cured in accordance

with TTMAC requirements.

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 C423-23 Standard Test Method for Sound Absorption and Sound Absorption Coefficients by the Reverberation Room Method
  .2 ASTM E84-23c Standard Test Method for Surface Burning Characteristics of Building Materials
  .3 ASTM E1264-22 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(2022) 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 1: Armstrong Cortega Square Lay-in
- .1 Class A.
- .2 Composition: Wet formed Mineral Fiber
- .3 Pattern non-directional fissured.
- .4 Texture: medium.
- .5 Flame spread: ASTM E1264, Class A (U.L.C.), 25 or less.
- .6 Smoke developed 50 or less in accordance with ULC S102.
- .7 Noise Reduction Coefficient (NRC): ASTM C423; Classified with UL label, 0.55
- .8 Ceiling Attenuation Class (CAC): ASTM C1414; Classified with UL label, 35
- .9 Light Reflectance (LR) range of 0.82 to ASTM E1477.
- .10 Dimensional Stability: Standard
- .11 Edge Profile: Square Lay-In
- .12 Colour: White.
- .13 Size 610 x 1219 x 16 mm thick.
- .14 Shape flat.

.3 Alternate manufacturer: Products as manufactured by the following are acceptable, subject to Consultants approval of style, finish, performance characteristics and texture:
- .1 Armstrong Industries
- .2 Certainteed

.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 09 21 16 Gypsum Board
.2 Section 09 51 13 Acoustic Panel Ceilings

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 A653 / A653M – 23 Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process
  .4 ASTM A1011/A1011M-23 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
  .5 ASTM C635/C635M-22 Standard Specification for the Manufacture, Performance, and Testing of Metal Suspension Systems for Acoustical Tile and Lay in Panel Ceilings.
  .6 ASTM C636/C636M-19 Standard Practice for Installation of Metal Ceiling Suspension Systems for Acoustical Tile and Lay-In Panels.
  .7 ASTM E84-23c Standard Test Method for Surface Burning Characteristics of Building Materials
  .8 ASTM E119-22 Standard Test Methods for Fire Tests of Building Construction and Materials
  .9 ASTM E1264-22 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 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.

.2 Face width: 22 mm

.3 Edge Moldings and Trim: Hemmed angle moulding to match main beams and cross tees.

.4 Structural Classification: Intermediate Duty System, ASTM C635.

.5 Colour: White and match the actual colour of the specified ceiling tile.

.6 Standard of Acceptance:
.1 Armstrong Prelude XL
.2 Donn DXT
.3 Certainteed Classic Environmental Stab.

.7 Attachment Devices: Size for five times design load indicated in ASTM C635, Table 1, Direct Hung unless otherwise indicated or required.

.8 Threaded Rod: to ASTM A397. Galvanized or zinc plated.

.9 Wire for Hangers and Ties: ASTM A641, Class 1 zinc coating, soft annealed, with a yield stress load of at least time three design load, but not less than 2.06 mm thick.

.10 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

1.3 References

.1 ASTM International (ASTM)
  .1 ASTM E648-19ae1 Standard Test Method for Critical Radiant Flux of Floor-Covering Systems Using a Radiant Heat Energy Source
  .2 ASTM E662-21ae1 Standard Test Method for Specific Optical Density of Smoke Generated by Solid Materials
  .3 ASTM F710-22 Standard Practice for Preparing Concrete Floors to Receive Resilient Flooring
  .4 ASTM F970-22 Standard Test Method for Measuring Recovery Properties of Floor Coverings after Static Loading
  .5 ASTM F1303-04(2021) Standard Specification for Sheet Vinyl Floor Covering with Backing
  .6 ASTM F1869-23 Standard Test Method for Measuring Moisture Vapor Emission Rate of Concrete Subfloor Using Anhydrous Calcium Chloride
  .7 ASTM F2170-19a Standard Test Method for Determining Relative Humidity in Concrete Floor Slabs Using in situ Probes.
.2 Resilient Floor Covering Institute (RFCI)
  .1 RFCI Standard Slab Moisture Test Method (Calcium Chloride Method)
.3 Underwriters Laboratories of Canada (ULC)
  .1 ULC 102.2-2018 Method of Test for Surface Burning Characteristics of Flooring, Floor Covering and Miscellaneous Materials and Assemblies.
.4 South Coast Air Quality Management District (SCAQMD), California State
  .1 SCAQMD Rule 1113 Architectural Coatings.
  .2 SCAQMD Rule 1168 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 current printed product literature, specifications, installation instructions, and field reports.

.3 Submit shop drawings to indicate materials, details, and accessories including but limited to the following:
  .1 Submit a cut diagram indicating seam locations and roll direction. Use mitered seam layouts for corners when changing directions 180 degrees (e.g. when running material down corridors which bisect at a right angle), unless approved otherwise.

.4 Samples: Submit duplicate 300 mm x 300 mm sample pieces of sheet material.

.5 Provide maintenance data for resilient sheet flooring for incorporation into Operation and Maintenance Manual specified in Section 01 78 00 – Closeout Submittals.

1.5 Quality Assurance

.1 Single-Source Responsibility: provide types of flooring and accessories supplied by one manufacturer, including leveling and patching compounds, and adhesives.

.2 Installer Qualifications: Installer experienced in performing work of this section who has specialized in installation of work similar to that required for this project.
.1 Training: Installer who has attended a manufacturer's flooring installation training clinic.

.3 Regulatory Requirements: Provide slip resistant sheet vinyl safety flooring in compliance with the following:
.1 Accessibility for Ontarians with Disabilities Act (AODA).
.2 Occupational Safety & Health Administration (OSHA).

.4 Mock-ups: Install at project site a job mock-up using acceptable products and manufacturer approved installation methods, including concrete substrate testing.
.1 Maintenance: Maintain mock-up during construction for workmanship comparison; remove and legally dispose of mock-up when no longer required.
.2 Incorporation: Mock-up may be incorporated into final construction upon Owner's approval.

.5 Pre-installation Meeting: Conduct pre-installation meeting to verify project requirements, substrate conditions, manufacturer's installation instructions, manufacturer's warranty requirements, and installer qualifications.

.6 Fire Performance:
.1 Fire Performance Characteristics: Provide resilient vinyl sheet flooring with the following fire performance characteristics as determined by testing material in accordance with ASTM test methods indicated below by a certified testing laboratory or other testing agency acceptable to authorities having jurisdiction:
.1 ASTM E648 Critical Radiant Flux of 0.45 watts per sq. cm. or greater, Class I
.2 ASTM E662 (Smoke Generation) Maximum Specific Optical Density of 450 or less

1.6 Extra Materials

.1 Provide extra stock materials of resilient flooring, base and adhesives in accordance with Section 01 78 00 – Closeout Submittals.

.2 Provide 3m^2 of each colour, pattern and type flooring material required for this project for maintenance use.

.3 Extra materials to be from same production run as installed materials.

.4 Clearly identify each roll of sheet flooring and each container of adhesive

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.

1.8 Waste Management and Disposal

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

1.9 Project Conditions

.1 Temperature Requirements: If storage temperature is below 18° C or the floor temperature is below 18° C, the sheet flooring product must be moved to a warmer place and allowed to reach this temperature before unrolling or installation.

.2 Maintain air temperature and structural base temperature at flooring installation area between 20° C and 26° C for 48 hours before, during and 48 hours after installation.

1.10 Warranty

.1 Warrant the work of this Section against defects of workmanship and material, for a period of five (5) 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 Homogeneous sheet vinyl without backing: to ASTM F1913.
  .1 Product basis of design: Polyflor Prestige PUR Homogeneous Sheet Flooring.
  .2 Colour: selected by Consultant. Up to three (3) colours will be selected.

.2 Vinyl Weld Rod
  .1 Provide solid colour vinyl weld rod as produced by flooring manufacturer, and intended for heat welding of seams. Colour shall be compatible with field colour of flooring or as selected by Consultant to contrast with field colour of flooring.

.3 Sheet vinyl flooring by the following alternate acceptable manufacturers will be accepted subject to approval by the Consultant of material specifications and colour availability:
  .1 Gerflor
  .2 Johnsonite
  .3 Tarkett

.4 Test data:
  .1 Flexibility (ASTM F137): Passes
  .2 Chemical Resistance (ASTM F925): Passes
  .3 Static Load Limit (ASTM F970): Passes 250 psi
  .4 Resistance to Heat (ASTM F1514): $\Delta E \leq 8$
  .5 Resistance to Light (ASTM F1515): $\Delta E \leq 8$
  .6 Residual Indentation (ASTM F1914): Passes
  .7 Static Coefficient of Friction (ASTM D 2047): ≥ 0.5 SCOF
  .8 Flammability (ASTM E648, Critical Radiant Flux): Class 1 (≥ 0.45 W/cm^2)
  .9 Limited Commercial Warranty: 10 years

.5 Base Accessories:
  .1 Fillet Strip: 19 mm radius fillet strip compatible with resilient sheet material.
  .2 Cap Strip: Extruded flanged zero edge vinyl reducer strip approximately 25 mm exposed height with 13 mm flange.

2.1 Adhesives

.1 Primers and adhesives: type recommended by resilient flooring manufacturer for specific material on applicable substrate.

.2 Provide seam adhesive at seams as recommended by the resilient flooring manufacturer.

2.2 Accessories

.1 Subfloor Filler and Leveler: Use only gray Portland cement-based "moisture tolerant" underlayment's, and patching compounds as recommended by manufacturer. Use for filling cracks, holes or leveling. Gypsum based materials are not acceptable.

.2 Sealing
.1 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 Transition: Provide transition/reducing strips tapered to meet abutting materials.

.4 Threshold: Provide threshold of thickness and width to suit application.

.5 Resilient Edge Strips: 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 manufacturer's standard colours.

.6 Metal edge strips: Aluminum extruded, smooth, mill finish with lip to extend under floor finish, shoulder flush with top of adjacent floor finish.

.7 Sealer and wax: type recommended by resilient flooring material manufacturer for material type and location. Maximum VOC limit 100 g/L to SCAQMD Rule 1113

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 Compliance: Comply with manufacturer's product data, including product technical bulletins, product catalog, installation instructions.

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

.3 Ensure concrete floors are clean and dry by using test methods recommended by flooring manufacturer.

3.3 Preparation

.1 Flooring shall be installed over subfloors conforming to ASTM F710 for concrete and other monolithic floors or ASTM F1482 for wood subfloors.

.2 Clean floor and apply filler; trowel and float to leave smooth, flat hard surface. Prohibit traffic until filler cured and dry.

.3 Remove sub-floor ridges and bumps. Fill low spots, cracks, joints, holes and other defects with sub-floor filler.

.4 Conduct moisture tests per ASTM F2170 on all concrete slabs regardless of age or grade level. ASTM F-2170 Internal Relative Humidity (IRH) test results must not exceed 85%.

.5 Do not proceed with work until results of moisture condition tests are acceptable.

.6 When patching, a moisture tolerant patching compound must always be used.

.7 Prime or seal concrete slab to resilient flooring manufacturer's printed instructions.

3.4 Application: Flooring

.1 Provide high ventilation rate, with maximum outside air, during installation, and for 72 hours after installation. If possible, vent directly to outside. Do not let contaminated air recirculate through building air distribution system. Maintain extra ventilation for at least one month following building occupation.

.2 Apply adhesive uniformly using recommended trowel. Do not spread more adhesive than can be covered by flooring before initial set takes place.

.3 Lay flooring with seams parallel to building lines to produce a minimum number of seams. Border widths minimum 1/3 width of full material.

.4 Run sheets in direction of traffic. Double cut sheet joints heat weld according to manufacturer's printed instructions.

.5 As installation progresses, and after installation roll flooring with 45 kg minimum roller to ensure full adhesion.

.6 Cut flooring around fixed objects.

.7 Terminate flooring at centerline of door in openings where adjacent floor finish or colour is dissimilar.

.8 Install metal edge strips at unprotected or exposed edges where flooring terminates.

3.5 Application: Integral Cove Base

.1 Set preformed fillet strip to receive base.

.2 Install the base with adhesive, terminate expose edge with the cap strip.

.3 Form internal and external corners to the geometric shape generated by the cove at either straight or radius corners.

.4 Weld joints as specified for the flooring. Seal cap strip to wall with an adhesive type sealant.

.5 Unless otherwise specified or shown where sheet flooring is scheduled, provide integral base at intersection of floor and vertical surfaces.

3.6 Field Quality Control

.1 Manufacturer's Field Services: 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.

3.7 Cleaning

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

.2 Remove temporary coverings and protection of adjacent work areas.

.3 Remove excess adhesive from floor, base and wall surfaces without damage.
.1 Repair or replace damaged installed products.

.4 Clean installed products in accordance with manufacturer's instructions prior to Owner's acceptance.

.5 Sweep or vacuum all construction debris and dust, then clean the flooring with manufacturer's recommended products using an auto scrubber.

3.8 Protection

.1 Protect new floors from time of final set of adhesive until final inspection.

.2 Protect finished installation from damage from other trades using a non-staining, temporary floor protection system, such as a reusable textured plastic sheeting without taping to the surface of the flooring.

.3 Prohibit traffic on floor for 48 hours after installation.

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

1.3 References

.1 ASTM International (ASTM)
  .1 ASTM C131/C131M-20 Standard Test Method for Resistance to Degradation of Small-Size Coarse Aggregate by Abrasion and Impact in the Los Angeles Machine
  .2 ASTM D412-16(2021) Standard Test Methods for Vulcanized Rubber and Thermoplastic Elastomers -Tension
  .3 ASTM D635-22 Standard Test Method for Rate of Burning and/or Extent and Time of Burning of Plastics in a Horizontal Position
  .4 ASTM D638-22 Standard Test Method for Tensile Properties of Plastics
  .5 ASTM D2240-15(2021) Standard Test Method for Rubber Property—Durometer Hardness
  .6 ASTM D2370-16(2021) Standard Test Method for Tensile Properties of Organic Coatings
  .7 ASTM F2170 -19a Standard Test Method for Determining Relative Humidity in Concrete Floor Slabs Using in situ Probes
.2 Canadian General Services Board (CGSB)
  .1 CAN/CGSB-25.20 Surface Sealer for Floors.
.3 Terrazzo Tile and Marble Association of Canada (TTMAC)
  .1 TTMAC Specification Guide 09 30 00

1.4 Submittals

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

.2 Submit duplicate samples of manufacturer's full range of colours for specified products for selection of colours by the Consultant.

.3 Submit minimum 2 - 300 x 300 mm square samples of epoxy flooring in colours and finish matching existing, for review and acceptance by the Owner.

.4 Samples for Verification: Match Consultant's samples for each type, material, colour, and pattern of terrazzo and accessory required showing the full range of colour, texture, and pattern variations expected. Label each sample to identify manufacturer's matrix colour and aggregate types, sizes, and proportions. Prepare samples of same thickness and from same material to be used for the Work.

.5 Shop Drawings: Include terrazzo fabrication and installation requirements. Include plans, elevations, sections, component details, and attachments to other Work. Show layout of the following:
  .1 Divider and control and expansion joint strips.
  .2 Base and border strips.

.6 Manufacturer's product data for each type of terrazzo and accessory. System will be evaluated on the basis of these standards. For tests not listed in published data, manufacturer shall supply missing data according to referenced standard.
.1 Physical properties.
.2 Performance properties.
.3 Specified tests.
.4 Material Safety Data Sheet.
.5 Manufacturer's standard warranty.

.7 Manufacturer Experience: Furnish list of at least five epoxy terrazzo projects using material being submitted for this project installed during the past five years of the same scope, complexity and at least 50% of the square footage.

.8 Provide maintenance data for epoxy terrazzo for incorporation into Operation and Maintenance Manual specified in Section 01 78 00 – Closeout Submittals.

1.5 Project Conditions

.1 Evaluate slab condition prior to surface preparation, including slab moisture content and extent of repairs required, if any.

.2 Test concrete substrates according to ASTM F2170. Do not install terrazzo or terrazzo accessories until test results are 80% or less RH. If 80% RH is not met, consult terrazzo manufacturer for additional drying or negative side moisture mitigation methods.

.3 Prior to and during each day of installation, the terrazzo contractor shall verify that the dew point is at least -15 ° C less than the slab and air temperature.

.4 Protect surrounding substrates and surfaces, as well as in-place equipment from damage during surface preparation and system application.

.5 Job area shall be free of other trades during surface preparation, crack detailing, divider strip installation, terrazzo pouring, and for a period of 36 hours upon completion. Provide coordination between terrazzo contractor and general contractor or construction manager as to types of traffic allowed on poured terrazzo after pouring but before coarse grinding, or after grouting but before polishing. Once polished, job area shall be free of other trades until 36 hours after completion of seal coat.

.6 Ensure that drains in installation area are working and raised or lowered to actual finish elevation of terrazzo.

.7 Provide ventilation by use of fans or other devices.

.8 Maintain lighting at minimum uniform level of 540 Lux – 650 Lux in areas where terrazzo system is being installed. If possible, schedule terrazzo installation so that permanent lights will be in place and working during installation.

.9 Ensure that leaks from pipes and other sources are corrected prior to flooring installation.

.10 Provide minimum substrate and atmospheric temperature of 12 ° C during stripping and pouring and until 48 hours after completion of pouring. Do not allow substrate or air temperature to fall below 4 ° C after terrazzo has been poured.

.11 Provide protection from other trades prior to final acceptance of Owner.

1.6 Quality Assurance

.1 Work of this Section shall be executed by a company who is a member in good standing of the Terrazzo, Tile and Marble Association of Canada. The work shall be done under proper supervision by persons skilled in the methods following the recommendations of the manufacturer of the products involved and having a minimum of two years of proven experience and who can provide proof of completion of at least five projects of similar size and complexity during last five years.

.2 Installer Qualifications: A qualified installer who is acceptable to epoxy terrazzo manufacturer to install manufacturer's products.

.3 Terrazzo Contractor Qualifications: Use resin manufacturer certified terrazzo contractor with at least five years of satisfactory experience in installation of resinous epoxy terrazzo with proof of T.T.M.A.C. membership.

.4 Source Limitations: Obtain primary Epoxy Terrazzo Flooring System materials including membranes, primers, resins, and hardening agents from a single manufacturer with documented experience providing resinous ground terrazzo flooring, and proof of TTMAC membership.

.5 Obtain aggregates, solvents and other secondary materials from source recommended by manufacturer of primary materials.

.6 Pre installation Conference: Conduct conference at Project site to comply with requirements in Section 01 31 00. Review methods and procedures related to terrazzo including, but not limited to, the following:
   .1 Inspect and discuss installation procedures, joint details, jobsite conditions, substrate specification, vapor barrier details and coordination with other trades.
   .2 Review and finalize construction schedule and verify availability of materials, Installer's personnel, equipment, and facilities needed to make progress and avoid delays.
   .3 Review special terrazzo designs and patterns.
   .4 Review dust-control procedures.
   .5 Review plans for concrete curing and site drying to enable timely achievement of suitable slab moisture conditions.

.7 Comply with TTMAC Guide Specification and written recommendations for terrazzo type indicated unless more stringent requirements are specified.

.8 Mockups: Install mockups to verify selections made under sample submittals and to demonstrate aesthetic effects and qualities of materials and execution. Install mockups of at least 10.0 square meters of typical flooring and base condition for each colour and pattern in locations directed by Consultant. Approved mockups may become part of the completed work if undisturbed at time of Substantial Performance.

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 Primary system materials shall be delivered in manufacturer's undamaged, unopened containers. Each container shall be clearly marked with the following:

.1 Product name
.2 Manufacturer's name
.3 Component designation.
.4 Ratio of component mixture.
.5 WHMIS Data Sheets.

.4 Handle materials by methods which prevent damage.

.5 Inspect direct jobsite deliveries to assure that quantities are correct and that materials comply with requirements and are not damaged.

.6 Replace, at no cost to Owner, material found to be defective in manufacturing or that was damaged in transit, handling or storage

.7 Store materials per manufacturer's instructions and as follows:
.1 Seals and labels shall be intact and legible.
.2 Temperature of storage area shall be maintained between 12 ° C and 32 °C.

.8 Do not use materials which have been stored for a longer period of time than the manufacturer's maximum recommended shelf life.

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 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.

PART 2 PRODUCTS

2.1 Epoxy Terrazzo

.1 The basis of Design is Master Terrazzo Technologies, LLC, (www.MasterTerrazzo.com).

.2 Products of other manufacturers will be considered provided they equal or exceed the material requirements and design qualities of the specified product. Submit requests for Consultant's approval with complete technical data for evaluation.

.3 Thickness: The system shall be installed at a thickness to match existing but not less than 9.5 mm unless otherwise indicated.

2.2 Materials

.1 Epoxy Resin: Manufacturer's standard recommended for use indicated and in colour required for mix indicated. Low VOC type.

.2 Physical Properties without Aggregates:
.1 Hardness: ASTM D2240, 70-85 Shore D.
.2 Minimum Tensile Strength: 33.09 mPA per ASTM D638 for a 50 mm specimen made using a "C" die per ASTM D412.

.3 Minimum Compressive Strength: 82.7 mPA per ASTM D695, Specimen B cylinder.
.4 Chemical Resistance: No deleterious effects by contaminants listed below after 7-day immersion at room temperature per ASTM D1308.
.1 Distilled water.
.2 Mineral water
.3 Isopropanol
.4 Ethanol
.5 0.025 percent detergent solution
.6 1% percent soap solution.
.7 10 percent sodium hydroxide
.8 10 percent hydrochloric acid
.9 5 percent acetic acid.

.3 Physical Properties with Aggregates: For resin blended with Georgia White marble, ground, grouted, and cured per requirements in TTMAC Specification Guide 09 30 00.Comply with the following:
.1 Flammability: Self-extinguishing, maximum extent of burning 6.35 mm per ASTM D635.
.2 Linear Coefficient of Thermal Expansion: 11.4x10-7 cm/cm m per ºC) for temperature range of -24° to 60° C per ASTM D696.

.4 Bond Strength: When tested in accordance with Field Test Method for surface soundness and adhesion as described in ACI Committee No. 403 Bulletin Title No. 59-43 the Epoxy terrazzo shall comply with the following value: 100% concrete failure minimum, with 2.1 mPA minimum tensile strength.

.5 Marble Chips:
.1 Sizes shall be #2's, #1's and #0's, conforming to T.T.M.A.C. gradation standards.
.2 Abrasion and Impact resistance when testing in accordance with ASTM C131 shall not exceed 40% loss.
.3 Weight gain upon 24-hour immersion in water not to exceed 0.75 %.
.4 Chips shall contain no deleterious or foreign matter.
.5 Dust content less than 1% by weight.
.6 Label bags legibly with correct name and size of chip.

.6 Flexible Epoxy Membrane: MasterFlex Flexible Epoxy Membrane, 100% solids with the following properties:
.1 Tensile Strength, ASTM D2370, 20° C: 10.3 Mpa.
.2 Elongation, ASTM D2370, 20° C: 130%

.7 Primer: Morricite Primer, 100% solids, moisture insensitive. No solvent containing primers are allowed.

.8 Epoxy Slope and Fill Mortar: 100% Solids fill mortar system including blended aggregate.

.9 Divider-Strip Adhesive: Epoxy-resin adhesive recommended by adhesive manufacturer for this use and acceptable to terrazzo manufacturer.

.10 Finishing Grout: Morricite Terrazzo Grout, 100% Solids.

.11 Control Joint Filler: MTT ColorFlex 100% Solids Flexible, Grindable Epoxy Joint Filler in colour selected by Consultant to match/compliment terrazzo with the following properties:
.1 Tensile Strength: ASTM D2370 @ 20° C: 11.03 mPA.
.2 Elongation: ASTM D2370 @ 20° C: 100%

.3 Tensile Modulus: ASTM D2370 @ 20° C: 191.67 Mpa.

.12 Seal Coat: Thin-coat terrazzo sealer of or approved by terrazzo manufacturer.

.13 Mix: Comply with TTMAC Specification Guide 09 30 00 and manufacturer's written instructions for component proportions and mixing.

.14 Colour and Pattern Schedule: Provide specified terrazzo matrices matching existing terrazzo flooring.

2.3 Divider and Accessory Strips

.1 Thin-Set Divider Strips: Angle or T Type.
.1 Material: White zinc alloy, half hard brass, plastic in colour selected from manufacturers product range.
.2 Top Width: 1.6 mm.

.2 Control-Joint Strips: Separate, double L-type angles, positioned back to back, that match material, thickness, and colour of divider strips and in depth required for topping thickness indicated. 1.60 mm x 9.5 mm with MTT ColorFlex flexible sealant).

.3 Accessory Strips: Match divider-strip width, material, and colour unless otherwise indicated. Use the following types of accessory strips as required to provide a complete installation:
.1 Base bead and base dividers.
.2 Edge beads for exposed edges of terrazzo.

.4 Anchoring Strips: Adhere the strips to the floor with Morricite Primer or hot glue. Do not mechanically anchor.

.5 Apply clear lacquer to concealed bottoms, sides, and edges of extruded units set into terrazzo.

2.4 Accessories

.1 Base: Poured in Place Terrazzo Cove Base with 19 mm radius, height to match existing.

.2 Patching and Fill Material: MorriFill or MonoFill slope and fill mortar.

.3 Abrasive Strips: Metal channels matching strips to receive epoxy and abrasive aggregate.

.4 Joint Sealants:
.1 Control joints: ColorFlex.
.2 Expansion Joints; Sealant manufacturers complying with requirements in Section 07 92 00 - Joint Sealants.

.5 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. Free from crystallizing salts or water soluble alkaline salts. Submit maintenance instructions for bonded terrazzo.

.6 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 Examination

.1 Examine substrates and areas, with Installer present, for compliance with requirements for installation tolerances and other conditions affecting performance. Proceed with installation only after unsatisfactory conditions, including levelness tolerances, have been corrected.

.2 Examine areas to receive terrazzo for:
.1 Defects in existing work that affect proper execution of terrazzo work.
.2 Deviations beyond allowable tolerances for the concrete slab work.
.3 Age (minimum 30 days) and moisture content of concrete slab. If concrete substrate moisture exceeds 80% according to ASTM F2170, consult terrazzo manufacturer for additional drying or negative side moisture mitigation methods.

.3 Start work only when all defects are corrected.

.4 Prior to system application, treat cracks with flexible membrane and fill substrate irregularities with Epoxy Fill and in accordance with manufacturer's recommendations.

3.2 Preparation

.1 Clean substrates of substances that might impair epoxy terrazzo bond, including oil, grease, and curing compounds.

.2 Provide clean, dry, and neutral substrate for terrazzo application. Determine dryness characteristics by performing moisture tests recommended by terrazzo manufacturer.

.3 Concrete: Provide sound concrete surfaces free of laitance, glaze, efflorescence, curing compounds, form-release agents, dust, dirt, grease, oil, and other contaminants incompatible with epoxy terrazzo.

.4 Prepare concrete substrate to "open" surface pores by means of vacuum shotblasting or with a terrazzo grinder, dry with coarse diamond stones with a vacuum unit. Surface preparation results should achieve a CSP3-CSP5 profile according to International Concrete Repair Institute Guideline No. 03732. Remove all contaminating or bond breaking substances including but not limited to dust, laitance, curing compounds, coatings, sealers, oil, grease and carpet or vinyl mastics or adhesives. Any oil or grease not removed by vacuum blasting must be chemically removed. All spalled or deteriorated concrete should be mechanically removed by scabbling or chipping hammers. Acid etching is not acceptable.

.5 Repair or level damaged concrete with epoxy fill mortar. Latex fills or self-leveling underlayments are not acceptable.

.6 Cracks and non-expansion joints greater than 1.6mm wide after surface preparation shall be prepared until sound.

.7 Protect other work from dust generated by grinding operations. Control dust to prevent air pollution and comply with environmental protection regulations.

.8 Erect and maintain temporary enclosures and other suitable methods to limit dust migration and to ensure adequate ambient temperatures and ventilation conditions during installation.

3.3 Epoxy Terrazzo Installation with Crack Detailing

.1 Comply with T.T.M.A.C. written recommendations for terrazzo and accessory installation.

.2 Place, rough grind, grout, cure grout, fine grind, and finish terrazzo according to manufacturer's written instructions and T.T.M.A.C. Guide Specification for Epoxy Terrazzo.

.3 Ensure that matrix components and fluids from grinding operations do not stain terrazzo by reacting with divider and control-joint strips.

.4 Delay fine grinding until heavy trade work is complete and construction traffic through area is restricted.

.5 Divider and Accessory Strips: Install in locations indicated in adhesive setting bed without voids below strips.

.6 Control-Joint Strips: Install back to back directly over concrete control and now-doweled construction joints leaving a space appropriate for anticipated movement- typically 6.35 mm – 9.5 mm. Fill gap between control joints with flexible epoxy joint sealant.

.7 Cracks and Non-Expansion Joints:
- .1 Type 1: Hairline cracks shall be filled with epoxy primer and receive detail coat of epoxy primer with 150 mm fiberglass tape.
- .2 Type 2: Fill cracks greater than hairline but less than 1.6mm wide after surface preparation with epoxy primer or MasterFlex Membrane. Place detail coat of Membrane over crack and embed 300 mm wide MasterFlex fabric. Lightly abrade or solvent wipe treated cracks prior to applying primer.
- .3 Type 3: Fill cracks greater than 1.6mm with MasterFlex Membrane. Place 25-30 mil detail coat so that Membrane extends at least 230 mm to 300 mm on each side of crack or joint. After Membrane has leveled, lay precut MasterFlex Fabric into wet Membrane. Smooth cloth with a flat steel trowel, allowing cloth to be encapsulated but remain exposed on the surface of Membrane. Lightly abrade or solvent wipe treated cracks prior to applying primer.

.8 Primer: Apply epoxy primer evenly over prepared substrate, cracks and non-expansion joints at the rate of 18 – 28 m^2 per 3.785 liters for normal concrete, to thoroughly wet surface, but avoiding "ponding" the material.

.9 Placing Terrazzo:
- .1 Mix terrazzo binder with chips and fillers in ratios as approved by manufacturer.
- .2 Trowel apply terrazzo mixture over epoxy primer to provide smooth seamless surface at a minimum of 9.5 mm thick. Allow cure per manufacturer's recommendations prior to grinding operations.
- .3 Rough Grinding: Grind with 24 or finer grit stones or with comparable diamond plates.
- .4 Intermediate Grinding: Follow initial grind with 80 or finer grit stones.

.10 Grouting: Cleanse floor with clean water and rinse thoroughly. Remove excess rinse water by wet vacuum and machine until completely dry. Apply epoxy grout to fill voids.

.11 Fine Grinding: Grind with 120 grit stones until all grout is removed from surface. Repeat rough grinding, grout coat, and fine grinding if large voids exist after initial fine grinding. Produce surface with a minimum of 70 percent aggregate exposure.

.12 Remove and replace terrazzo areas that show evidence of lack of bond with substrate. Cut out terrazzo areas in panels defined by strips and replace to match adjacent terrazzo.

.13 Construction Tolerances: Limit variation in terrazzo surface from level to 6.0 mm in 3.0 metres.

3.4 Patching

.1 In areas where removal work will leave terrazzo surfaces exposed, existing terrazzo floors shall be patched according to TTMAC recommendation. Where existing doors and frames and anchoring devices have been removed, holes shall be filled with grout and surface refinished to match existing terrazzo floor finish as required by Manufacturer's recommendation.

.2 Where existing terrazzo floor surfaces are to be refinished in areas where doors and frames, etc. have been removed, remove all surface wax and/or sealer using solvent as recommended by TTMAC for such purpose prior to starting any refinishing work. Procedure as set forth for final grinding as specified hereinabove shall be followed unless otherwise recommended by TTMAC.

3.5 Refinishing Terrazzo Flooring and Base

.1 All work shall be executed with conventional terrazzo grinding equipment according to trade practice. No lighter type machines, such as floor scrubbing machines, will be accepted.

.2 Initial Grinding:
  .1 Grind with 24 or finer grit stone (fine mesh sand can be used if needed) all in the presence of water.
  .2 Follow initial grind with 80 or finer grit stones in the presence of water but omit sand.

.3 Grouting:
  .1 Cleanse floor with ample clean water and rinse.
  .2 After removing excess rinse water, the floor shall be grouted by machine or by hand using identical cement/acrylic grout with colour and pigments to match the matrix of the existing terrazzo and as used in the existing topping taking care to fill voids.
  After the grout has attained its initial set, the surface shall be cured for a minimum of 72

.4 Curing Grout:
  .1 The grout shall remain on the surface for a minimum of 72 hours.

.5 Fine Grinding:
  .1 Wash all surfaces with a neutral cleaner; follow by rinsing with clean water and allow to dry.
  .2 Apply one coat of sealer, as per manufacturer's directions.

.6 Cleaning and Sealing:
  .1 Wash all surfaces with a neutral cleaner; follow by rinsing with clean water and allow to dry.
  .2 Apply one coat of sealer, as per manufacturer's directions.

.7 Protection:
  .1 Upon completion, this Work shall be ready for final inspection and acceptance by the Consultant.
  .2 Protect the finished floor from all trades that will follow using non-staining coverings

3.6 Protection

.1 Upon completion, the work shall be ready for final inspection and acceptance by the Consultant. Protect the finished floor from the time the terrazzo installation is complete and until Substantial Performance.

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 08 11 00 Metal Doors and Frames
.2 Section 09 21 16 Gypsum Board

1.3 References

.1 ASTM International (ASTM)
  .1 ASTM A780/A780M-20 Standard Practice for Repair of Damaged and Uncoated Areas of Hot-Dip Galvanized Coatings
.2 Environmental Protection Agency (EPA)
  .1 Test Method for Measuring Total Volatile Organic Compound Content of Consumer Products, Method 24 (for Surface Coatings).
.3 Master Painters Institute (MPI)
  .1 MPI Architectural Painting Specifications Manual, 2018
  .2 MPI Standard GPS-1-12 and GPS-2-12 MPI Green Performance Standard for Painting and Coatings.
.4 Society for Protective Coatings (SSPC)
  .1 Systems and Specifications, SSPC Painting Manual 2009
.5 Underwriters Laboratories of Canada (ULC)
  .1 ULC 102-18 Standard Method of Test for Surface Burning Characteristics of Building Materials and Assemblies
.6 South Coast Air Quality Management District, California State (SCAQMD)
  .1 SCAQMD Rule 1113-96, Architectural Coatings.
.7 Green Seal GS-11 Green Seal Environmental Standard for Paints and Coatings, January 1997.
.8 National Fire Code of Canada

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.

.3 Samples:
  .1 Submit full range colour sample chips.
  .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 Certificates: submit certificates signed by manufacturer certifying that materials comply with specified performance characteristics and physical properties and SCAQMD Rule 1113-96.

.5 Provide maintenance data for paint products for incorporation into Operating and Maintenance Manuals specified in Section 01 78 00- Closeout Submittals. Include following:
  .1 Product name, number, type and use.

.2 Colour numbers.
.3 MPI Environmentally Friendly classification system rating.

1.5 Quality Assurance

.1 Qualifications:
.1 Contractor: to have a minimum of five years proven satisfactory experience.
.2 Qualified journeypersons as defined by local jurisdiction to be engaged in painting work.
.3 Apprentices: may be employed provided they work under direct supervision of qualified journeyperson in accordance with trade regulations.

.2 Conform to latest MPI requirements for painting work including preparation and priming.

.3 Materials: in accordance with MPI Painting Specification Manual "Approved Product" listing and from a single manufacturer for each system used.

.4 Paint materials to be highest quality product of an approved manufacturer listed in MPI Painting Specification Manual and to be compatible with other coating materials as required.

.5 Retain purchase orders, invoices and documents to prove conformance with noted MPI requirements when requested by Consultant.

.6 Provide mock-up in accordance with Section 01 45 00 - Quality Control.
.1 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. Locate where directed.
.2 Mock-up will be used to judge workmanship, substrate preparation, operation of equipment and material application and workmanship to MPI Architectural Painting Specification Manual standards.
.3 Allow 24 hours for inspection of mock-up before proceeding with work.
.4 When accepted, mock-up will demonstrate minimum standard of quality required for this work. Approved mock-up may remain as part of finished work.

1.6 Shipping, Handling and Storage

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

.2 Deliver and store materials in original containers, sealed, with labels intact. Labels to indicate:
.1 Manufacturer's name and address.
.2 Type of paint or coating.
.3 Compliance with applicable standard.
.4 Colour number in accordance with established colour schedule.

.3 Provide and maintain dry, temperature controlled, secure storage. Store materials and equipment in well-ventilated area with temperature range 7 ° C to 30 ° C. Store materials and supplies away from heat generating devices.

.4 Observe manufacturer's recommendations for storage and handling.

.5 Keep areas used for storage, cleaning and preparation, clean and orderly. After completion of operations, return areas to clean condition.

.6 Remove paint materials from storage only in quantities required for same day use.

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

.8 Remove damaged, opened and rejected materials from site.

1.7 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.

1.8 Waste Management and Disposal

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

.2 Place materials defined as hazardous or toxic in designated containers. Handle and dispose of hazardous materials in accordance with Municipal regulations.

.3 Unused materials must be disposed of at official hazardous material collections site.

.4 Paint and related materials are regarded as hazardous products and are subject to regulations for disposal. Information on these controls can be obtained from the Ministry of the Environment.

.5 Material which cannot be reused must be treated as hazardous waste and disposed of in an appropriate manner.

.6 Place materials defined as hazardous or toxic waste in containers or areas designated for hazardous waste.

1.9 Maintenance

.1 Extra Materials:
  .1 Submit maintenance materials in accordance with Section 01 78 00 - Closeout Submittals.
  .2 Quantity: provide one four litre can of each type and colour of finish coating. Identify colour and paint type in relation to established colour schedule and finish system.
  .3 Deliver to Owner and store where directed.

1.10 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 ° 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 in writing by Consultant and product manufacturer, perform no painting when:
  .1 Ambient air and substrate temperatures are below 10 ° C.
  .2 Substrate temperature is above 32 ° 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 ° C variance between the air/surface temperature. Paint should not be applied if the dew point is less than 3 ° C below the ambient or surface temperature. Use sling psychrometer to establish the relative humidity before beginning paint work.
.2 Ensure that conditions are within specified limits during drying or curing process, until newly applied coating can itself withstand 'normal' adverse environmental factors.
.3 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.
.4 Test for moisture using calibrated electronic Moisture Meter. Test concrete floors for moisture using "cover patch test".
.5 Test concrete and plaster surfaces for alkalinity as required.

.3 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.

PART 2 PRODUCTS

2.1 Materials

.1 Provide paint materials for paint systems from single manufacturer.

.2 Products to meet requirements of GS-11 or SCAQMD Rule 1113-96

.3 Paint materials listed in the MPI Approved Products List (APL) are acceptable for use on this project.

.4 Only qualified products with E2 or E3 "Environmentally Friendly" rating are acceptable for use.

.5 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.

.6 Paints, coatings, adhesives, solvents, cleaners, lubricants, and other fluids:
  .1 Non-flammable, biodegradable.
  .2 Manufactured without compounds which contribute to ozone depletion in the upper atmosphere.
  .3 Manufactured without compounds which contribute to smog in the lower atmosphere.
  .4 Do not contain methylene chloride, chlorinated hydrocarbons or toxic metal pigments.
  .5 Recycled content of 15% post-consumer and ½ post-industrial waste.

.7 Formulate and manufacture water-borne surface coatings with no aromatic solvents,

formaldehyde, halogenated solvents, mercury, lead, cadmium, hexavalent chromium or their compounds.

.8 Flash point: 61 °C or greater for water-borne surface coatings and recycled water-borne surface coatings.

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 will be based on limited range.

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

2.3 Mixing and Tinting

.1 Perform colour tinting operations prior to delivery of paint to site.

.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.

SPEC NOTE: SEE http://www.paintinfo.com/mpi/guide/fullspecREV.pdf FOR FULL MPI SPECIFICATION

2.5 Interior Painting Systems

.1 Concrete Horizontal Surfaces:
.1 INT 3.2A Latex floor enamel [gloss] [low gloss] finish.

.2 Concrete Floor Sealer: Refer to Section 09 67 00-Fluid Applied Flooring.

.2 Concrete Vertical Surfaces:
.1 Water repellant sealer as specified in Section 07 19 00 –Water Repellants.

.3 Structural Steel:
.1 INT 5.1X Latex G5 semi-gloss finish (over quick dry shop primer).

.4 Metal Fabrications:
.1 INT 5.3A Latex G5 semi-gloss finish

.5 Metal Floors and Decking:
.1 INT 5.1LL Epoxy Deck Coating finish (over epoxy primer).

.6 Zinc Coated Metal Deck:
.1 INT 5.3H. Interior Latex semi-gloss, dry fog/fall type.

.7 Galvanized Metal: interior doors, frames, railings, misc. steel, pipes, and ducts.
.1 INT 5.3A Latex G5 semi-gloss finish

.8 Concrete Masonry:
.1 INT 4.2D High performance architectural latex G5 semi-gloss finish.

.9 Concrete masonry units at wet areas and change rooms:
.1 INT 4.2G Epoxy (tile-like) finish.

.10 Wood Clear Polyurethane Finish:
.1 INT 6.3K Polyurethane varnish G6 gloss finish.

.11 Interior Wood Doors
.1 INT 6.3A High performance architectural latex G5 semi-gloss finish.

.12 Wood Fire Retardant Finish (ceilings and soffits)
.1 INT 6.3S water-borne fire retardant, clear finish, ULC approved. Flame spread rating 150.

.13 Electrical Equipment Backboards:
.1 INT 6.4P Fire retardant, pigmented coating. Low odour/low VOC. Semi-gloss (UL/ULC rated).

.14 Gypsum Board: Walls and Bulkheads.
.1 INT 9.2A Latex G3 eggshell finish over latex sealer.

.15 Gypsum Board: Ceilings and Bulkheads (wet areas)
.1 INT 9.2E Epoxy (tile like) finish

.16 Gypsum Board: Ceilings and Bulkheads:
.1 INT 9.2A Latex G2 velvet finish over latex sealer.

.17 All other surfaces not noted above: high performance finish suitable for commercial and institutional environment and in accordance with MPI painting manual.

PART 3 EXECUTION

3.1 General

.1 Perform preparation and operations for interior painting in accordance with MPI Architectural Painting Specifications Manual except where specified otherwise.

.2 Compliance: comply with manufacturer's written recommendations or specifications, including product technical bulletins, handling, storage and application instructions, and data sheets.

3.2 Examination

.1 Investigate existing substrates for problems related to proper and complete preparation of surfaces to be painted. Report damages, defects, unsatisfactory or unfavourable conditions to Consultant before proceeding with work.

3.3 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 and in accordance with paint manufacturers and MPI recommendations. 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 Move and cover furniture and portable equipment as necessary to carry out painting operations. Replace as painting operations progress.
  .2 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 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 and SSPC-SP 6. 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.

.7 Touch up of shop primers with primer as specified.

.8 Do not apply paint until prepared surfaces have been accepted by Consultant.

3.4 Application

.1 Apply paint materials in accordance with paint manufacturer's written application instructions.

.2 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.

.3 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, 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.

.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.

3.5 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 natural gas piping yellow.

.10 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.

.11 Do not paint interior transformers and substation equipment.

3.6 Field Quality Control

.1 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.

.2 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.

3.7 Cleaning and Restoration

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

.2 Remove protective coverings and warning signs as soon as practical after operations cease.

.3 Remove paint splashings on exposed surfaces that were not painted. Remove smears and spatter immediately as operations progress, using compatible solvent.

.4 Protect freshly completed surfaces from paint droppings and dust to approval of Consultant. Avoid scuffing newly applied paint.

.5 Restore areas used for storage, cleaning, mixing and handling of paint to clean condition as approved by Consultant.

End of Section

PART 1 GENERAL

1.1 General

.1 Conform to the requirements of Division 1.

1.2 Related Sections

.1 Section 09 21 16 Gypsum Board

1.3 References

.1 ASTM International (ASTM)
  .1 ASTM A653/A653M-23 Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process
  .2 ASTM A924/A924M-22a Standard Specification for General Requirements for Steel Sheet, Metallic-Coated by the Hot-Dip Process
  .3 ASTM B456-17(2022) Standard Specification for Electrodeposited Coatings of Copper Plus Nickel Plus Chromium and Nickel Plus Chromium
  .4 ASTM C1503-18 Standard Specification for Silvered Flat Glass Mirror
  .5 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/ASC B651:23 Accessible Design for the Built Environment.
  .2 CSA G164-18(R2023) 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 Watrous

2.3 Components

.1 TPD: Toilet Tissue Dispenser:
.1 Supplied by Owner, installed by Contractor.

.2 SD: Soap Dispenser: Liquid wall mounted soap dispenser.
.1 Supplied by Owner, installed by Contractor.

.3 Hand Dryer:
.1 World Dryer SLIMdri Automatic touchless hand dryer surface mounted ADA compliant White Aluminum, 120-240V.

.4 GB1: Grab Bar, 38 mm diameter x 1.6 mm wall tubing of stainless steel, 76 mm diameter wall flanges, concealed screw attachment, flanges welded to tubular bar, provided with steel back plates and all accessories. Knurl bar at area of hand grips. Grab bar material and anchorage to withstand downward pull of 2.2 kN. 600 mm long.
.1 Bobrick B-6806.99 x 24

.5 GB2: Barrier Free Toilet Grab Bars 2 (L-shaped) 760 x 760 38 mm dia. Peened finish c/w mounting kits.
.1 Bobrick B-6898.99, 90° Angle Grab Bar.

.6 Framed Mirror:
.1 Bobrick B-1658 1830

.7 SND: Sanitary Napkin Disposal
.1 Supplied by Owner, installed by Contractor.

.8 Not used

.9 Coat Hook:
.1 Bobrick B-983

.10 Backrest: Bobrick B-5892

.11 Recessed Napkin Dispenser:
.1 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 Manufacturer's 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

MAPLE ENVIRONMENTAL INC.
ENVIRONMENT, HEALTH & SAFETY CONSULTANTS

LIMITED DESIGNATED SUBSTANCE SURVEY REPORT (WASHROOM RENOVATION)

O'Neill Collegiate and Vocational Institute
301 Simcoe St N
Oshawa, Ontario

Presented to:

Durham District School Board
400 Taunton Road East
Whitby, Ontario
L1R 2K6

Attention: Richard Racioppa

January 12, 2026

Maple Project No. 23090

EXECUTIVE SUMMARY

Maple Environmental Inc. ('Maple') was retained by Durham District School Board to perform a survey for Designated Substances as well as polychlorinated biphenyls (PCBs) and mould within the specified areas of O'Neill Collegiate and Vocational Institute located at 301 Simcoe St N, Oshawa, Ontario (the 'Site'). It is our understanding that the building requires a survey to identify possible hazardous building materials that may be disturbed during the proposed renovations of the specified areas.

The survey was limited to: Custodian Storage room (1101A), Ladies Washroom (1127), Girl's Washroom (1128), Custodian Storage room (1128A), Custodian Room (1129), Boy's Washroom (1130), Washroom (1130A) and Washroom (1131). The findings of the current survey are summarized below. Please refer to the main body of this report for details on all materials.

Asbestos

No known sources of asbestos-containing materials were identified within the surveyed areas at the time of the assessment.

It should be noted that due to the presence of solid walls and ceilings in the surveyed areas, access for viewing within the wall and ceiling cavities was not always possible. Suspect asbestos-containing materials may be present within wall and ceiling cavities that were not identified but are suspected to be present in this report. Caution should be taken when demolishing solid walls and ceilings within the areas being surveyed.

Lead

Based on the findings, the following general conclusions are made:

- Representative bulk samples of the predominant paint colours were collected which indicated the presence of lead-containing paint and low level lead paints (i.e. "virtually safe") in the surveyed area.
- Representative bulk samples of mortar were collected which indicated the presence of low level lead mortars (i.e. "virtually safe") in the surveyed area.
- It should be noted that lead may also be present in wiring connectors, electric cable sheathing, solder joints on copper piping, ceramic glazes, lead sheeting, and as sub-surface layers to the most recent paint layers currently applied, where present at the Site.

Mercury

- Mercury vapour is present in all fluorescent light tubes.
- Liquid mercury is present in thermostat switches located within the surveyed area.

Silica

- Free crystalline silica, present as common construction sand, is present in all concrete and masonry products where present within the surveyed areas.

Mould

- No visible mould growth was observed to be present within the surveyed area at the time of the assessment.

Polychlorinated Biphenyls (PCBs)

- The fluorescent lamp fixtures observed contained a combination of T8 and T12 fluorescent light tubes. T12 fixtures are older fixtures and have the potential of using PCB-containing ballast. T8 fixtures have electronic ballast and are considered as not containing PCB.
- The surveyed area has not been re-lamped; thus, a percentage of the light ballasts are suspected to be PCB-containing.
- No lights that contained ballast were observed to be present on site.
- All transformers observed on site were new and not suspected to contain PCBs.

Recommendations

Based on the Laboratory Analytical Results and observations made on Site, Maple provides the following recommendations.

- Low Level Lead paints and mortar (0.1% or less or 1000 mg/Kg or less) are considered virtually safe provided that;
    - airborne lead concentrations are kept below 0.05 mg/m^3
    - general dust suppression and worker hygiene procedures are utilized
    - torching or other activities that create fumes are not completed
- Disturbance of paints that are considered Lead-Containing or Lead-Based should be completed using Lead abatement procedures as appropriate in accordance with EACC and Ministry of Labour Guidelines as outlined in Section 5.0 of the Report.
- Recycle and reclaim mercury from fluorescent light tubes and thermostats when taken out of service. Do not break lamps or separate liquid mercury from components. Liquid mercury is classified as a hazardous waste and must be disposed of in accordance with local regulations.
- Proper dust suppression techniques and other safety precautions to control possible generation of silica dust from the demolition of concrete and masonry products present in the surveyed area should follow those outlined in the Ministry of Labour Guideline- Silica on Construction Projects, 2004.

Appropriate procedures for asbestos, lead, mercury, silica, mould, and PCBs must be utilized if these materials are likely to be disturbed by scheduled renovations. Please refer to Section 5.0 of the report to review the required procedures.

Consideration should be given to assessing other areas of the building that could be associated with the current project, including travel path, mechanical or electrical ties in the areas outside of the immediate project area, and penetrations through the slab impacting floors below or above.

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1.0 INTRODUCTION

Maple Environmental Inc. ('Maple') was retained by Durham District School Board to perform a survey for Designated Substances as well as polychlorinated biphenyls (PCBs) and mould within the specified areas of O'Neill Collegiate and Vocational Institute located at 301 Simcoe St N, Oshawa, Ontario (the 'Site'). It is our understanding that the building requires a survey to identify possible hazardous building materials that may be disturbed during the proposed renovations of the specified areas.

The survey was limited to: Custodian Storage room (1101A), Ladies Washroom (1127), Girl's Washroom (1128), Custodian Storage room (1128A), Custodian Room (1129), Boy's Washroom (1130), Washroom (1130A) and Washroom (1131).

Section 30 of the Ontario Occupational Health and Safety Act requires that the following Designated Substances be included in a Designated Substance Survey:

Asbestos
Lead
Mercury
Silica
Isocyanates
Vinyl Chloride Monomer
Benzene
Acrylonitrile
Coke Oven Emissions
Arsenic
Ethylene Oxide

Additional detailed information with respect to asbestos was collected at the time of the survey to ensure compliance with Ontario Regulation 278/05.

The assessment was performed by Nirmal Soni of Maple on December 16, 2025.

2.0 APPLICABLE ONTARIO REGULATIONS

Applicable Ontario Regulations for each of the materials included in the investigation are briefly described below.

2.1 Designated Substances and Other Hazardous Materials

Section 30 of the Occupational Health and Safety Act requires building owners or their agents (architects, general contractors, etc.) to prepare or have prepared a Designated Substance report for specified potentially hazardous materials possibly present in a facility. The owner must ensure that a prospective constructor has received a Designated Substance report before entering into a binding contract with the contractor. The owner is liable to the contractor for damages and costs arising from unreported materials (of which the owner should reasonably have been aware), and could also be subject to orders and fines from the Ministry of Labour.

In addition to the requirements under the Occupational Health and Safety Act, Section 6 of the Ministry of Labour Regulations for Construction Projects requires the contractor, when submitting the Notice of Project form, report any Designated Substances likely to be used, handled or disturbed during the project.

The disturbance of asbestos materials on construction projects is controlled by Ministry of Labour Regulation R.R.O. 2005/278. The disposal of asbestos waste is controlled by Ministry of Environment Regulation, R.R.O. 1990/347.

There are no specific Ministry of Labour regulations for control of the other Designated Substances on construction projects. However, the Ministry of Labour actively enforces the general duty clause of the Health and Safety Act which protects workers and provides guidance on exposure monitoring, permissible exposure levels, medical monitoring, etc. for all Designated Substances.

Although Regulations exist for many of the Designated Substances, they apply to industry settings using Designated Substances in manufacturing processes, and do not apply to general property management, renovation or maintenance of buildings.

Polychlorinated Biphenyls ("PCBs") and mould were also included in the investigation, which are not specifically named as Designated Substances. No specific regulations are attached to these materials, but are generally governed by the due diligence section of the Health and Safety Act for employers to protect their workers.

2.2 Ontario Regulation 278/05 (Asbestos)

Ontario Regulation 278/05 applies to buildings with regards to maintenance, renovations or demolition work where asbestos-containing materials (ACM) is present and may be disturbed. The Regulation requires that a detailed asbestos inventory be performed in all buildings where friable and non-friable asbestos materials are present. The inventory must be available at the work place and must identify the type of asbestos, and location of asbestos on a room-by-room basis. The following report does not necessarily meet the requirements for an asbestos survey under Ontario Regulation 278/05.

2.3 Ontario Regulation 347

Ontario Regulation 347 applies to the transport of waste from the location of generation to a landfill site authorized to receive specific wastes. The regulation also prescribes procedures on how the specific wastes are to be handled at the landfill site.

The major requirements of the building owner and the person(s) removing the waste are to ensure that:

- The waste is appropriately packaged and labelled;
- The transport vehicle is appropriately placard; and
- The waste is to be transported as directly as possible to the landfill site once it leaves the site.

Some wastes require the owner to register a Generator (of waste) number and many wastes require classification that can restrict or even prohibit their disposal in landfill.

It is important to note that the building owner can be held responsible for the waste until the waste disposal site accepts it.

2.4 Ontario Regulation 362

Ontario Regulation 362, made under the Ontario Environmental Protection Act applies to the waste management and transport of PCB waste from the location of generation to a landfill site authorized to receive specific wastes. The regulation also prescribes procedures on how the specific wastes are to be handled at the landfill site.

3.0 SURVEY SCOPE AND METHODOLOGY

The methodology for the assessment for hazardous materials is outlined below.

In order to determine the location of materials included in the assessment, the project technologist entered the room where practical (i.e. where access was possible without the demolition of walls, roof or ceilings or destruction of flooring). Representative views were made above accessible suspended ceiling systems. Cavities within solid ceiling and wall systems were accessed via existing access panels only. The inventory did not include demolition of building systems or finishes to check on possible hidden conditions.

3.1 Asbestos-Containing Building Materials (ACM)

The scope of the survey included all friable asbestos products and all major non-friable asbestos materials. The term friable is applied to a material that can be readily reduced to dust or powder by hand or moderate pressure. Asbestos materials that are friable have a much greater potential to release airborne asbestos fibres when disturbed.

Typical friable asbestos materials include: sprayed fireproofing or thermal insulation, textured (stippled) plaster, and thermal mechanical insulation. Typical non-friable materials include: asbestos cement (transite) products, vinyl floor tiles, asbestos textiles and gaskets. Additional materials such as ceiling tiles, drywall joint compounds and vinyl sheet flooring are classified as non-friable, but because of their ability to release dust when disturbed are considered as "potentially friable" for the purpose of this report.

Bulk samples of materials suspected to contain asbestos were collected for analysis during the survey. Specifically, a small volume of material was removed either from a damaged section of suspect material, or taken from intact material. In these latter cases, the material from which the sample was collected was sealed with tape to temporarily prevent fibre release. Samples were placed in plastic bags and sealed until receipt by an independent laboratory. To ensure quality results, the independent laboratory chosen successfully participates in an "Asbestos Proficiency Analytical Testing Program". As such, these independent laboratories are responsible for their findings.

Bulk samples were collected in accordance with regulatory sampling requirements and with sufficient frequency to obtain a general pattern of asbestos use within the building. Due to building renovations or modifications that may have occurred in the past, the consistency of the application of asbestos materials may not be uniform throughout the entire Site. It is important to note that without sampling each individual wall, pipe section, ceiling tile etc. it is not possible to identify the asbestos content of every material present in the selected areas. For this reason, visually similar materials are considered to be homogenous with those already sampled elsewhere in the building without additional analysis.

O. Reg. 278/05 prescribes that a minimum number of samples be collected of materials suspected to contain asbestos. These minimum sampling requirements are summarized in Table 1, below.

Table 1- Suspect ACM Bulk Sampling Requirements		
Type of Material	**Quantity of Material Present**	**Minimum # of Bulk Samples Required**
Surfacing Materials (i.e. sprayed fireproofing, drywall joint compound, texture coat, and plaster)	Up to 90 sq/m (1000 sq/ft)	3
	From 90 sq/m (1000 sq/ft) to 450 sq/m (5000 sqft)	5
	Greater than 450 sq/m (5000 sq/ft)	7
All other potential ACM	Any	3

Excluding surfacing materials, the laboratory was instructed to cease analysis within Sample Groups of homogenous materials when one of the samples in the group is found to contain asbestos. For example, if three samples of a type of vinyl floor tile are collected (as required by O. Reg. 278/05) and submitted for analysis and the first sample is positively identified as containing asbestos, the balance of the sample group is not analysed.

EMC Scientific ("EMC"), an independent laboratory, was selected to analyse the collected bulk suspect asbestos samples. EMC successfully participates in an "Asbestos Proficiency Analytical Testing Program" and as such, is responsible for its findings. EMC followed the Code of Practice for the identification of asbestos in bulk material, as detailed in O. Reg. 278/05. Bulk samples were analysed using the Polarized Light Microscopy ("PLM") Technique with Dispersion Staining. The identification of asbestos fibre in bulk material is based on a collective set of parameters dependent on the unique shape and crystallographic properties of each fibre as viewed through the microscope. This method is useful for the qualitative identification of asbestos and the semi-quantitative determination of asbestos content in bulk materials expressed as a percent of projected area. The method identifies types of asbestos and also measures percent of asbestos as perceived by the analyst in comparison to standard area projections or trained experience.

The recommendations made as part of this report with respect to asbestos have taken into consideration: the condition and accessibility of the material, vibration, air movement, and general activities likely to occur within the vicinity of the ACM.

In each area or room inventoried, the technician recorded the quantity, condition (GOOD, FAIR, or POOR) of each suspect asbestos-containing material.

The definitions for condition and accessibility of the asbestos-containing items are as follows:

GOOD Material is intact with no visible signs of damage.

FAIR Material is visibly damaged but can be repaired.

POOR Material is damaged beyond repair and likely needs to be removed.

Where ACM is found to be in GOOD condition and not likely to deteriorate or fall, the general recommendation would be to re-evaluate the condition of the material on an annual basis (required by O. Reg. 278/05). This recommendation can be subject to change if the material is located in a manner that persons untrained in asbestos awareness could physically damage it.

Where ACM is found to be damaged (i.e. FAIR or POOR condition), a recommendation to have the material cleaned-up, repaired, removed, enclosed, or encapsulated is offered. The recommendation will also indicate which asbestos procedure should be used to perform the remedial work (i.e. Type 1, Type 2, Type 3, or Glove Bag Removal Methods).

3.2 Lead

The investigation included the collection and analysis of all major paint colour applications for the presence of lead in the paint. Other materials that possibly contain lead were identified by known historic use, where relevant. For the purpose of this report, sampling for lead in mortar was also performed. The lead samples were analysed by EMSL Canada ("EMSL"), using atomic absorption spectrophotometry. EMSL is AIHA (American Industrial Hygiene Association) and NIOSH (National Institute of Occupational Safety and Health) accredited for this type of analysis. The Laboratory Analysis Report for lead in paint samples is included with this Report as Appendix II.

3.3 Mercury

The assessment included a visual identification of fluorescent light tubes, switches, electrical controls, heating system thermostats, thermometers, and other components historically known to contain mercury.

3.4 Other Designated Substances

Other materials listed in Section 1.0 of this Report were identified on a visual basis where present, as part of the current assessment. It should be noted that no manufacturing or heavy industrial activities are known by Maple to occur at the Site. Therefore, Designated Substances associated with these activities (i.e. those other than Asbestos, Lead, Mercury, and Silica) would not be expected to be present in the selected areas.

3.5 Mould

The assessment for mould was conducted in accordance with standard industry practice as set out in the Canadian Construction Association (CCA) "Mould Guidelines for the Canadian Construction Industry" for a visual assessment. Although there are no regulatory requirements in Ontario for such an assessment, the CCA Guidelines, and similar guidelines from other agencies have been accepted as the industry standard by most experts, consultants, the Ontario Ministry of Labour, and the Canadian Construction Association.

All guidelines and protocols for mould investigations indicate that investigations should be performed largely on a visual basis with limited collection of bulk and/or air samples. The Ontario Ministry of Labour has consistently enforced the removal of all mould from buildings regardless of mould genus or species, and therefore bulk samples or air samples for confirmation of mould are not typically collected for investigative purposes where mould is visible.

3.6 Polychlorinated Biphenyls

Manufacturers labels/codes collected from fluorescent lamp ballasts suspected of containing Polychlorinated Biphenyls ("PCBs") are compared with Environment Canada's document titled "Identification of Lamp Ballasts Containing PCBs", which identifies PCB-containing ballasts.

3.7 Limitations and Omissions from Scope

Due to the nature of building construction some limitations exist as to the possible thoroughness of any building materials inventory. The field observations, measurements, and analysis are considered sufficient in detail and scope to form a reasonable basis for the findings presented in this report. Maple warrants that the findings and conclusions contained herein have been made in accordance with generally accepted evaluation methods in the industry and applicable regulations at the time of the performance of the inventory.

It is possible that conditions may exist which could not be reasonably identified within the scope of the inventory or which were not apparent during the Site investigation. Maple believes that the information collected during the investigation concerning the property is reliable. No other warranties are implied or expressed.

During a standard ACM inventory performed for the purposes of regulatory compliance, it is industry practice to exclude certain suspect asbestos-containing materials from sampling. These materials are often excluded from sampling due to the risk of compromising the health and safety of the technician, other building occupants, or the integrity of the systems with which these materials are associated. Examples of such materials include; elevator brakes, roofing felts and mastics, high voltage wiring, mechanical packing and gaskets, underground services or piping, fire-doors, window caulking and levelling compound. Where observed, these materials were presumed to be ACM.

3.8 Drawings

Drawings included in Appendix III will indicate the locations of any major applications of an asbestos-containing material with the exception of mechanical insulations, drywall, plaster finishes and transite (which cannot be accurately depicted on drawings). The information depicted on the drawings is not to scale and is only meant to provide a general representation of the locations of asbestos-containing materials.

4.0 INVENTORY FINDINGS

The findings of the survey are presented separately below for each of the eleven Designated Substances as well as microbial growth (mould), and polychlorinated biphenyls. Asbestos is further detailed by typical applications of asbestos.

4.1 Asbestos

The following is a brief discussion of the extent to which ACM was identified in the surveyed area. The discussion is organized under the headings of materials that are generally suspected of containing asbestos. The sample numbers refer to the laboratory analysis report presented as Appendix I and summarised in Table 2 below. Fourteen (14) bulk samples were collected for the determination of asbestos content and submitted to the lab to be analysed. Due to the presence of more than one phase

of material in some of the original samples the laboratory may have performed multiple analyses for some samples. In addition, some of the samples may not have been analysed due to the positive confirmation of asbestos in a previous sample of the same material during analysis. As a result, a total of Twenty-three (23) samples were analyzed.

Table 2- Analysis Summary of Asbestos Bulk Samples

Sample No.	Room Name	Sample Description	Result
S-01A	Boy's Washroom – 1130	Drywall joint compound on Wall	None Detected
S-01B	Boy's Washroom – 1130	Drywall joint compound on Wall	None Detected
S-01C	Washroom – 1130A	Drywall joint compound on Wall	None Detected
S-02A	Ladies Washroom – 1127	Concrete Block Mortar - White, primer	None Detected
		Grey, cementitious material	None Detected
S-02B	Girl's Washroom – 1128	Concrete Block Mortar – Off White, primer	None Detected
		Grey, cementitious material	None Detected
S-02C	Boy's Washroom – 1130	Concrete Block Mortar – Off White, primer	None Detected
		Grey, cementitious material	None Detected
S-03A	Ladies Washroom – 1127	Plaster Ceiling - White, plaster	None Detected
		Light grey, plaster	None Detected
S-03B	Girl's Washroom – 1128	Plaster Wall - White, plaster	None Detected
		Grey, plaster	None Detected
S-03C	Custodian room – 1129	Plaster Wall - White, plaster	None Detected
		Grey, plaster	None Detected
S-03D	Custodian room – 1129	Plaster Wall - White, plaster	None Detected
		Grey, plaster	None Detected
S-03E	Boy's Washroom – 1130	Plaster Wall - White, joint compound	None Detected
		White, plaster	None Detected
		Grey, cementitious material	None Detected
S-04A	Custodian room - 1129	Ribbed Block Mortar - Grey, textured cementitious material	None Detected
S-04B	Custodian room - 1129	Ribbed Block Mortar - Grey, textured cementitious material	None Detected
S-04C	Custodian room - 1129	Ribbed Block Mortar - Grey, textured cementitious material	None Detected

No asbestos-containing materials (ACM) are present within the surveyed areas.

It should be noted that due to the presence of solid walls and ceilings in the surveyed areas, access for viewing within the wall and ceiling cavities was not always possible. Suspect asbestos-containing materials may be present within wall and ceiling cavities that were not identified but are suspected to be present in this report. Caution should be taken when demolishing solid walls and ceilings within the areas being surveyed.

4.1.1 Sprayed Fireproofing (Friable)

No sprayed fireproofing was identified within the surveyed area at the time of the assessment.

4.1.2 Thermal Mechanical Insulation (Friable)

No asbestos containing mechanical insulations were identified in the surveyed area. The various types of mechanical insulations and the system to which they are applied are summarised below.

Piping Systems:

Pipe systems observed within the surveyed area were either not insulated or were insulated with fibreglass, which is not suspected to contain asbestos.

Duct Systems:

Duct systems observed throughout the surveyed area were observed to be either un-insulated or were insulated with foil-face fibreglass insulation which is not suspected to contain asbestos.

4.1.3 Texture Finish (Friable)

No asbestos-containing textured finishes were identified within the surveyed area at the time of the assessment.

4.1.4 Acoustic Ceiling Tiles (Potentially Friable)

No asbestos-containing acoustic ceiling tile systems were identified within the surveyed area at the time of the assessment.

- AT-01 (2'x4' small Fissures and Dense Pinholes):

  AT-01 was observed to be present in throughout the surveyed area.

  No bulk samples of AT-01 were collected as a date stamp manufacture code (04/03/92) was present on the backside of the tile indicating that the tiles were recently manufactured and therefore not suspected to contain asbestos.

4.1.5 Vinyl Sheet Flooring (Potentially Friable)

No asbestos-containing vinyl sheet flooring finishes were identified within the

4.1.6 Vinyl Floor Tile (Non-Friable)

No asbestos-containing vinyl floor tile systems were identified within the surveyed area at the time of the assessment.

4.1.7 Asbestos Cement Products "Transite" (Non-Friable)

No transite cement products were observed to be present in the surveyed area at the time of the assessment.

4.1.8 Drywall Joint Compound (DJC) (Potentially Friable)

No asbestos-containing drywall joint compound was identified within the surveyed area at the time of the assessment.

Interior drywall finishes were present in the form of wall finishes within the Boy's Washroom – 1130 and Washroom – 1130A.

Three (3) representative samples (Sample Set S-01) of drywall joint compound were collected and analyzed for determination of asbestos content. Analysis of Sample Set S-01 found that the material does not contain asbestos**.**

4.1.9 Plaster (Potentially Friable)

No asbestos-containing plaster finishes were identified within the surveyed area.

Interior Plaster finishes were present in the form of wall and ceiling finishes within the Ladies Washroom – 1127, Girl's Washroom – 1128, Custodian room – 1129 and Boy's Washroom – 1130.

Five (5) representative samples (Sample Set S-03) of Plaster were collected and analyzed for determination of asbestos content. Analysis of Sample Set S-03 found that the material does not contain asbestos.

4.1.10 Vermiculite (Friable)

No vermiculite insulation was observed to be present within the surveyed area at the time of the assessment. It should be noted that loose fill vermiculite insulation can often be present within voids of masonry and possibly some pre-manufactured surveyed area components that would not be identified during the course of this assessment.

4.1.11 Other

- Masonry Mortar:

  Three (3) representative samples (Sample Set S-02) of Masonry mortar were collected and analyzed for asbestos content. Analysis of Sample Set S-02 found that the material does not contain asbestos.

  White primer associated with sample S02A and Off White Primer associated with samples S02B-C was also analyzed as part of the analysis process which confirmed that the material does not contain asbestos. Expansion Joint Caulking

- Ribbed Block Mortar

  Ribbed Block Mortar on wall was found to be present within Custodian room 1129.

  Three (3) representative samples (Sample Set S-04) Ribbed Block Mortar were collected and analyzed for asbestos content. Analysis of Sample Set S-04 found that the material does not contain asbestos.

4.2 Lead

Five (5) bulk paint samples and two (2) bulk mortar samples were collected for determination of lead content and submitted to EMSL for analysis during the assessment. The sample number refers to the Certificate of Analysis Report presented as Appendix II and summarised in Table 3 below.

Table 3– Analysis Summary of Lead Samples			
Sample No.	**Locations**	**Sample Description**	**Result**
Pb-01	Ladies Washroom - 1127 (Wall)	Beige Paint	<0.0064 % wt
Pb-02	**Girl's Washroom - 1128 (Wall)**	**Pestel Green Paint**	**0.24 % wt**
Pb-03	Custodian Storage Room - 1128A (Wall)	White Paint	<0.0064 % wt
Pb-04	Custodian Storage Room - 1101A (Wall)	Light Grey Paint	<0.0064 % wt
Pb-05	Custodian Room 1129 (Wall)	Brown Paint	0.054 % wt
Pb-06	Custodian Room 1129 (Wall)	Ribbed Block Mortar	100 mg/Kg
Pb-07	Girl's Washroom - 1128 (Wall)	Concrete Block Mortar	46 mg/K

No regulations currently exist in Ontario defining the lower limit of lead-containing material. The Ontario Ministry of Labour (MOL) has issued a guideline for lead abatement, entitled Guideline – Lead on Construction Projects (2004) which is considered enforceable.The Guideline does not specify what constitutes a material as "lead-containing". Instead, it outlines procedures based on the concentration of airborne lead encountered during removal, as well as provides procedures and/or specific operations for lead-containing material removal. However, the Environmental Abatement Council of Canada (EACC) Lead Guideline for Construction, Renovation, Maintenance or Repair document classifies paint as either Low-Level, Lead-Containing, or Lead-Based as follows:

Table 4- EACC Classification of Lead	
Concentration of Lead	**Definition**
0.1% or less OR 1000 mg/Kg or less	Low Level Lead ("Virtually Safe")
Greater than 0.1% but less than 0.5% OR Greater than 1000 mg/Kg but less than 5000 mg/Kg	Lead-Containing
Greater than 0.5% OR Greater than 5000 mg/Kg	Lead-Based

Based on these criteria and the results of the sample analysis, Pestel Green Paint on Concrete Block wall within Girl's Washroom - 1128 is considered to be "Lead-Containing". All other paints and mortars sampled are considered to be Low-Level Lead ("virtually safe"). Refer to Figure 1 for a representative view of the Lead-Containing paint within Girl's Washroom – 1128.

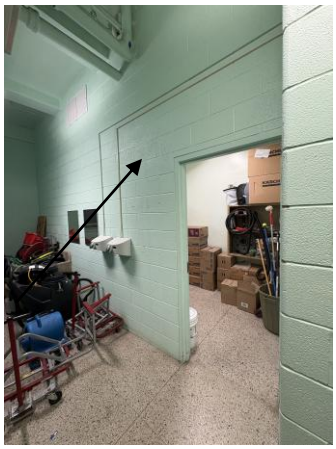

Figure 1: View of **Lead-containing** Paint on Concrete Block wall within Girl's Washroom - 1128

4.3 Mercury

Mercury vapour is present in all fluorescent light tubes.

Liquid mercury is also present in thermostat switches located within the surveyed area.

4.4 Silica

Free crystalline silica, present as common construction sand, is present in all concrete and masonry products where present in the Select areas surveyed.

4.5 Isocyanates

Free isocyanate compounds would not be expected to be found in a non-manufacturing facility.

4.6 Vinyl Chloride Monomer

Vinyl chloride monomer would not be expected to be found in a non-manufacturing facility.

4.7 Benzene

Benzene would not be expected to be found in a non-manufacturing facility.

4.8 Acrylonitrile

Acrylonitrile would not be expected to be found in a non-manufacturing facility.

4.9 Coke Oven Emissions

Coke oven emissions would not be expected to be found in a non-manufacturing facility.

4.10 Arsenic

Arsenic would not be expected to be found in a non-manufacturing facility.

4.11 Ethylene Oxide

Ethylene oxide would not be expected to be found in a non-manufacturing facility.

4.12 Mould

No visible mould growth was observed to be present within the surveyed area at the time of the assessment.

It is possible that mould growth is present in concealed areas such as wall or ceiling cavities, pipe chases, etc. or in areas not currently assessed by Maple. The client should notify Maple should any water damage or suspect mould growth be discovered.

4.13 Polychlorinated Biphenyls (PCBs)

The fluorescent lamp fixtures observed contained a combination of T8 and T12 fluorescent light tubes. T12 fixtures are older fixtures and have the potential of using PCB-containing ballast. T8 fixtures have electronic ballast and are considered as not containing PCB.

The surveyed area has not been re-lamped; thus, a percentage of the light ballasts are suspected to be PCB-containing.

No lights that contained ballast were observed to be present on site.

All transformers observed on site were new and not suspected to contain PCBs.

5.0 RECOMMENDATIONS

5.1 Asbestos

No known sources of asbestos-containing materials were identified within the surveyed areas at the time of the assessment.

It is important to note that due to the presence of solid wall and ceiling systems, the assessment was not able to confirm or deny the presence of ACM within wall and ceiling cavities. It is possible that ACM is present that was not identified in this report.

This report should not be read or interpreted as a "scope of work". Detailed abatement specifications should be prepared for asbestos removal that will impact the scope of any future renovations.

5.2 Lead

Pestel Green Paint on the Concrete Block wall within the Girl's Washroom – 1128, is **Lead-containing**. Follow appropriate procedures if disturbed or removed.

Disturbance of paints that are considered Lead-Containing or Lead-Based should be completed using Lead abatement procedures as appropriate in accordance with EACC and Ministry of Labour Guidelines and are generally as follows;

- Class 1 Lead abatement procedures (removing paint by means of chemical stripper or heat gun, removal of lead sheeting),
- Class 2A Lead abatement procedures (removal of lead paint using power tools equipped with HEPA vacuum attachment, removal by scraping or sanding using non-powered hand tools, or manual demolition of plaster finishes)
- Class 3A Lead abatement procedures (removal using power tools, welding or torching,
- Class 3B Lead abatement procedures (for abrasive blasting).

All other Paints and mortars (0.1% or less and/or 1000 mg/Kg or less) sampled were found to be low level lead ("virtually safe").

Low Level Lead paints and mortar are considered virtually safe provided that;

- airborne lead concentrations are kept below 0.05 mg/m3
- general dust suppression and worker hygiene procedures are utilized
- torching or other activities that create fumes are not completed

Further, prior to disposal it is recommended that materials containing lead should be sampled and analyzed for Metals/Inorganics using the Toxicity Characteristic Leaching Procedure (TCLP) as described under O. Reg. 347. The testing is required to determine waste classification in accordance with Ontario Regulation 347 of R.R.O. 1990 made under the Environmental Protection Act amending Reg. 558/00.

5.3 Mercury

Recycle and reclaim mercury from fluorescent light tubes and thermostats when taken out of service. Do not break lamps or separate liquid mercury from components. Liquid mercury is classified as a hazardous waste and must be disposed of in accordance with local regulations.

5.4 Silica

Proper dust suppression techniques and other safety precautions to control possible generation of silica dust from the demolition of concrete and masonry products present in the building should follow those outlined in the Ministry of Labour Guideline- Silica on Construction Projects, 2004.

5.5 Polychlorinated Biphenyls

Prior to disposal, all fluorescent lamp ballasts should be inspected and compared with Environment Canada's document titled "Identification of Lamp Ballasts Containing PCBs" for the presence of PCB's.

6.0 LIMITATIONS

Due to the nature of building construction some limitations exist as to the possible thoroughness of the subject investigation. The field observations are considered sufficient in detail and scope to form a reasonable basis for the findings presented in this report. Maple warrants that the findings and conclusions contained herein have

been made in accordance with generally accepted evaluation methods in the industry and applicable regulations at the time of the performance of the assessment.

It is possible that conditions may exist which could not be reasonably identified within the scope of the investigation or which were not apparent during the site investigation. Maple believes that the information collected during the investigation period concerning the property is reliable. No other warranties are implied or expressed.

Information provided by Maple is intended for Client use ONLY. Any use by a third party, of reports or documents authored by Maple, or any reliance by a third party on or decisions made by a third party based on the findings described in said documents, is the sole responsibility of such third parties. Maple accepts no responsibility for damages suffered by any third party as a result of decisions made or actions conducted.

The liability of Maple or its staff will be limited to the lesser of the fees paid or actual damages incurred by the Client. Maple will not be responsible for any consequential or indirect damages. Maple will only be liable for damages resulting from negligence of Maple; all claims by the Client shall be deemed relinquished if not made within two years after last date of services provided.

Please contact Maple Environmental Inc. at (905) 257-4408 for inquiries regarding this project.

End of Report

Sincerely,

MAPLE ENVIRONMENTAL INC.
Environment, Health and Safety Consultants

Prepared By:

Nirmal Soni
Project Technician

Reviewed By:

Ken Reeves
Operations Manager

APPENDIX I

LABORATORY ANALYSIS REPORT - ASBESTOS

emcscientific
INCORPORATED

Laboratory Analysis Report

To:

Nirmal Soni
Maple Environmental Inc.
482 South Service Road East, Suite 116
Oakville, Ontario
L6J 2X6

EMC LAB REPORT NUMBER: A128693
Job/Project Name: DDSB O'Neil CVI, Washroom Dsub
Analysis Method: Polarized Light Microscopy – EPA 600
Date Received: Dec 18/25 **Date Analyzed:** Dec 29/25
Analyst: Arth Parikh
Reviewed By: Jayoda Perera

No. of Phases Analyzed: 23
Job No: 23090
Number of Samples: 14
Date Reported: Dec 29/25

Client's Sample ID	Lab Sample No.	Description/Location	Sample Appearance	SAMPLE COMPONENTS (%)			
				Asbestos Fibres		Non-asbestos Fibres	Non-fibrous Material
S-01A	A128693-1	Drywall joint compound on Wall (Loc. Boy's Washroom – 1130)	White, joint compound	**ND**			100
S-01B	A128693-2	Drywall joint compound on Wall (Loc. Boy's Washroom – 1130)	White, joint compound	**ND**			100
S-01C	A128693-3	Drywall joint compound on Wall (Loc. Washroom – 1130A)	White, joint compound	**ND**			100
S-02A	A128693-4	Concrete Block Mortar (Loc. Ladies Washroom – 1127)	2 Phases: a) White, primer b) Grey, cementitious material	 **ND** **ND**		3	 97 100
S-02B	A128693-5	Concrete Block Mortar (Loc. Girl's Washroom – 1128)	2 Phases: a) Off white, primer b) Grey, cementitious material	 **ND** **ND**		3	 97 100
S-02C	A128693-6	Concrete Block Mortar (Loc. Boy's Washroom – 1130)	2 Phases: a) Off white, primer b) Grey, cementitious material	 **ND** **ND**		3	 97 100
S-03A	A128693-7	Plaster Ceiling (Loc. Ladies Washroom – 1127)	2 Phases: a) White, plaster b) Light grey, plaster	 **ND** **ND**			 100 100
S-03B	A128693-8	Plaster Wall (Loc. Girl's Washroom – 1128)	2 Phases: a) White, plaster b) Grey, plaster	 **ND** **ND**			 100 100
S-03C	A128693-9	Plaster Wall (Loc. Custodian room – 1129)	2 Phases: a) White, plaster b) Grey, plaster	 **ND** **ND**			 100 100

emcscientific
INCORPORATED

Laboratory Analysis Report

EMC LAB REPORT NUMBER: A128693
Client's Job/Project Name/No.: 23090
Analyst: Arth Parikh

Client's Sample ID	Lab Sample No.	Description/Location	Sample Appearance	SAMPLE COMPONENTS (%)			
				Asbestos Fibres		Non-asbestos Fibres	Non-fibrous Material
S-03D	A128693-10	Plaster Wall (Loc. Custodian room – 1129)	2 Phases: a) White, plaster b) Grey, plaster	 **ND** **ND**			 100 100
S-03E	A128693-11	Plaster Wall (Loc. Boy's Washroom – 1130)	3 Phases: a) White, joint compound b) White, plaster c) Grey, cementitious material	 **ND** **ND** **ND**			 100 100 100
S-04A	A128693-12	Ribbed Block Mortar (Loc. Custodian room 1129)	Grey, textured cementitious material	**ND**			100
S-04B	A128693-13	Ribbed Block Mortar (Loc. Custodian room 1129)	Grey, textured cementitious material	**ND**			100
S-04C	A128693-14	Ribbed Block Mortar (Loc. Custodian room 1129)	Grey, textured cementitious material	**ND**			100

Note:
1. Bulk samples are analyzed using Polarized Light Microscopy (PLM) and dispersion staining techniques. The analytical procedures are in accordance with EPA 600/R-93/116 method.
2. The results are only related to the samples analyzed. **ND** = None Detected (no asbestos fibres were observed), **NA** = Not Analyzed (analysis stopped due to a previous positive result).
3. This report may not be reproduced, except in full without the written approval of EMC Scientific Inc. This report may not be used by the client to claim product endorsement by NVLAP or any other agency of the U.S. Government.
4. The Ontario Regulatory Threshold for asbestos is 0.5%. The limit of quantification (LOQ) is 0.5%.

APPENDIX II

LABORATORY ANALYSIS REPORT – LEAD

EMSL Canada Inc.
2756 Slough Street, Mississauga, ON L4T 1G3
Phone/Fax: (289) 997-4602 / (289) 997-4607
http://www.EMSL.com torontolab@emsl.com

EMSL Canada Or	552522711
CustomerID:	55MAPL78
CustomerPO:	23090
ProjectID:	

Attn: **Nirmal Soni**
Maple Environmental, Inc.
482 South Service Road East
Suite 116
Oakville, ON L6J 2X6

Phone:	(905) 257-4408
Fax:	(905) 257-8865
Received:	12/19/2025 11:26 AM
Collected:	12/17/2025

Project: **23090 DDSB, O'Neil CVI, Washroom Dsub**

Test Report: Lead in Paint Chips by Flame AAS (SW 846 3050B/7000B)*

Client SampleDescription	*Collected*	*Analyzed*	*Weight*	*RDL*	*Lead Concentration*
Pb-01	12/17/2025	12/22/2025	0.2517 g	0.0064 % wt	<0.0064 % wt
552522711-0001	Site: Beige Paint on Concrete Block Wall (Loc. Ladies Washroom - 1127)				
Pb-02	12/17/2025	12/22/2025	0.2556 g	0.0064 % wt	0.24 % wt
552522711-0002	Site: Pestle Green Paint on Concrete Block Wall (Loc. Girl's Washroom - 1128)				
Pb-03	12/17/2025	12/22/2025	0.2548 g	0.0064 % wt	<0.0064 % wt
552522711-0003	Site: White Paint on Concrete Block Wall (Loc. Custodian Storage Room - 1128A)				
Pb-04	12/17/2025	12/22/2025	0.2539 g	0.0064 % wt	<0.0064 % wt
552522711-0004	Site: Light Grey Paint on Concrete Block Wall (Loc. Custodian Storage Room - 1101A)				
Pb-05	12/17/2025	12/22/2025	0.2534 g	0.0064 % wt	0.054 % wt
552522711-0005	Site: Brown Paint on Plaster Wall (Loc. Custodian Room 1129)				

Rowena Fanto, Lead Supervisor
or other approved signatory

Initial report from 12/30/2025 09:04:07

EMSL Canada Inc.
2756 Slough Street, Mississauga, ON L4T 1G3
Phone/Fax: (289) 997-4602 / (289) 997-4607
http://www.EMSL.com torontolab@emsl.com

EMSL Canada Or	552522711
CustomerID:	55MAPL78
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Attn: **Nirmal Soni**
Maple Environmental, Inc.
482 South Service Road East
Suite 116
Oakville, ON L6J 2X6

Phone:	(905) 257-4408
Fax:	(905) 257-8865
Received:	12/19/2025 11:26 AM
Collected:	12/17/2025

Project: **23090 DDSB, O'Neil CVI, Washroom Dsub**

Test Report: Lead by Flame AAS (SW 846 3050B/7000B)*

Client SampleDescription	*Collected*	*Analyzed*	*Weight (g)*	*RDL*	*Lead Concentration*
Pb-06	12/17/2025	12/29/2025	0.5022 g	32 mg/Kg	100 mg/Kg
552522711-0006	Site: Ribbed Block Mortar (Loc. Custodian Room 1129)				
Pb-07	12/17/2025	12/29/2025	0.5070 g	32 mg/Kg	46 mg/Kg
552522711-0007	Site: Concrete Block Mortar (Girl's Washroom 1128)				

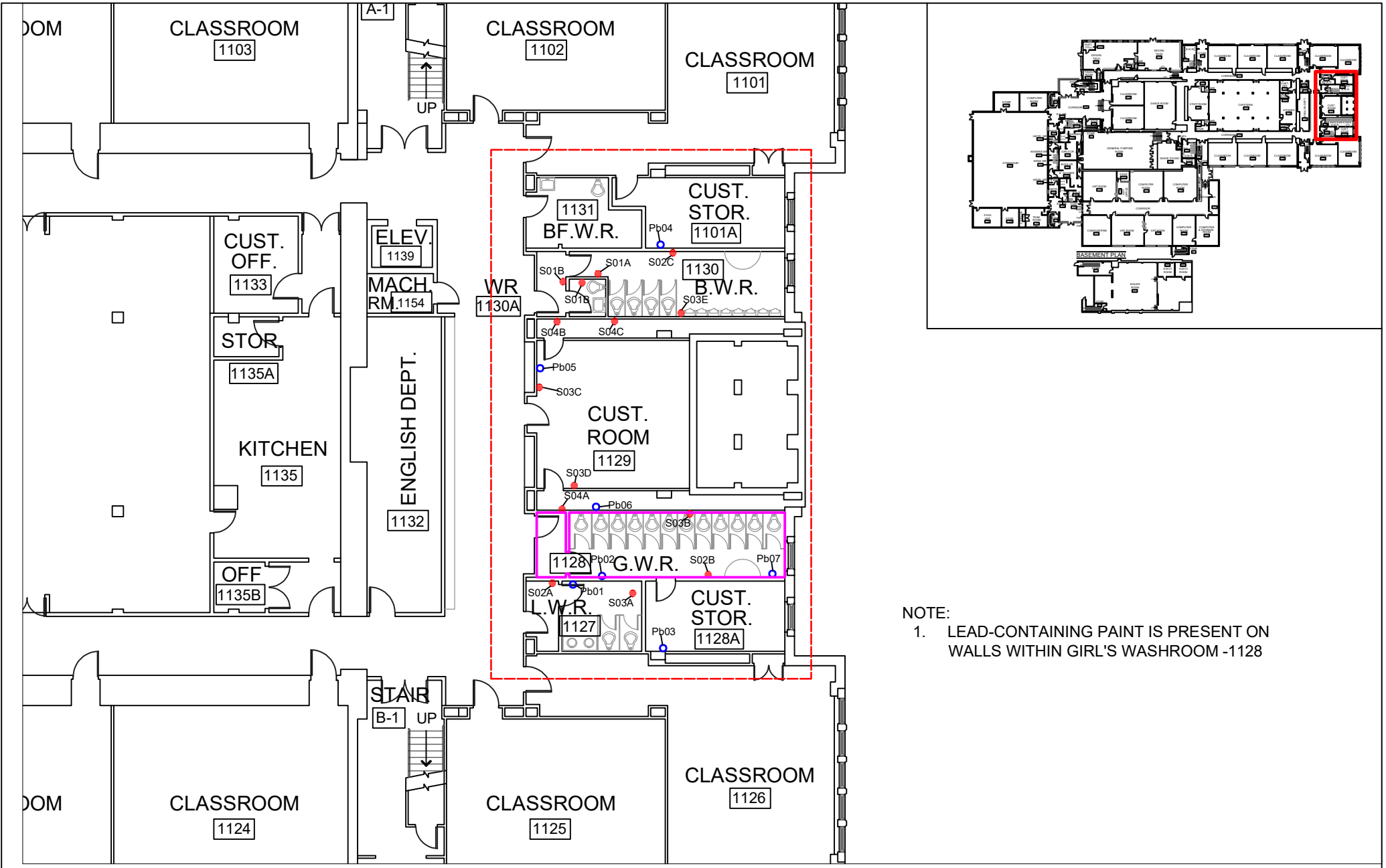
Rowena Fanto, Lead Supervisor
or other approved signatory

* Analysis following Lead in Soil/Solids by EMSL SOP/Determination of Environmental Lead by FLAA. Reporting limit is 40 mg/kg based on the minimum sample weight per our SOP. Unless noted, results in this report are not blank corrected. "<" (less than) result signifies that the analyte was not detected at or above the reporting limit. Measurement of uncertainty is available upon request. Definitions of modifications are available upon request.
Samples analyzed by EMSL Canada Inc. Mississauga, ON

Initial report from 12/30/2025 09:04:07

APPENDIX III

DRAWINGS



NOTE:
1. LEAD-CONTAINING PAINT IS PRESENT ON WALLS WITHIN GIRL'S WASHROOM -1128

MAPLE ENVIRONMENTAL INC.
ENVIRONMENT, HEALTH & SAFETY CONSULTANTS
482 South Service Rd. E. - Suite 116
Oakville - Ontario - L6J-2X6
Tel: (905) 257 4408 - Fax: (905) 257 8865
www.MapleEnvironmental.com

PROJECT NO.: 23090

Drawn By: N. Soni

Checked By: K. Reeves

SAMPLE LOCATIONS	
SYMBOL	DESCRIPTION
	ASBESTOS BULK SAMPLE: S##
	LEAD BULK SAMPLE: LBP##
	SURVEYED AREA

CONFIRMED & SUSPECTED ACM	
SYMBOL	DESCRIPTION
	NOTE

Designated Substance Survey

Durham District School Board
O'Neil Collegiate and Vocational Institute

First Floor Plan

SCALE: NTS

SHEET: DS-01

DATE: January 12, 2026