GROUND FLOOR WASHROOM AND CHANGE ROOM RENOVATION

PORT PERRY HIGH SCHOOL

160 Rosa Street, Port Perry ON. L9L 1L7

DDSB Tender: T25-06

Project 24164 **DATE** January 2025

BARRY BRYAN ASSOCIATES
Architects, Engineers, Project Managers
250 Water Street
Suite 201
Whitby, Ontario
Canada
L1N 0G5

Telephone: 905 666-5252
Toronto: 905 427-4495
Fax: 905 666-5256
Email: bba@bba-archeng.com
Web Site: www.bba-archeng.com

End of Section

Dwg. No.	Title	Issue No.	Rev. No.	Issue Date
ARCHITECTURAL				
A000	Drawing Plan & List of Drawings	3	-	February 19, 2025
A201	Overall Key Plan	3	-	February 19, 2025
A202	Part Demolition Plans	3	-	February 19, 2025
A203	Part Plans	3	-	February 19, 2025
A204	Part Reflected Ceiling Plans	3	-	February 19, 2025
A701	Interior Elevations	3	-	February 19, 2025
A702	Interior Elevations	3	-	February 19, 2025
A901	Schedules	3	-	February 19, 2025
Structural				
S201	Part Foundation Plan and Details	3	-	February 19, 2025
S202	Part Framing Plan and Details	3	-	February 19, 2025
MECHANICAL				
M-1.1	Mechanical Specifications	3	-	February 14, 2025
M-1.2	Mechanical Schedules II and Legend	3	-	February 14, 2025
M-1.3	Mechanical Schedules and Details	3	-	February 14, 2025
M-2.1	Ground Floor Plan – HVAC Demolition	3	-	February 14, 2025
M-2.2	Ground Floor Plan – HVAC New	3	-	February 14, 2025
M-3.1	Ground Floor Plan – Drainage Demolition	3	-	February 14, 2025
M-3.2	Ground Floor Plan – Drainage New	3	-	February 14, 2025
M-3.3	Ground Floor Plan – Plumbing Demolition	3	-	February 14, 2025
M-3.4	Ground Floor Plan – Plumbing New	3	-	February 14, 2025
M-4.1	Library Washroom – New Mechanical	3	-	February 14, 2025
ELECTRICAL				
E-1.1	Electrical Legend and Details	3	-	February 19, 2025
E-1.2	Electrical Details	3	-	February 19, 2025
E-1.3	Electrical Details	3	-	February 19, 2025
E-2.1	Electrical Plan Ground Floor	3	-	February 19, 2025
E-7.1	Electrical Single Line Diagram	3	-	February 19, 2025
E-9.1	Electrical Plans – Library Washroom	3	-	February 19, 2025
E-9.2	Electrical Plans – Staff WC Suites & Music Office	3	-	February 19, 2025
E-9.3	Electrical Plans – Change Rooms	3	-	February 19, 2025
E-9.4	Electrical Demolition Plans – Change Rooms	3	-	February 19, 2025

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 **Ground Floor Washroom and Chane Room Renovation, Port Perry High School 160 Rosa Street, Port Perry, 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 **Port Perry High School** 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 Special Conditions

.1 The following general and special conditions apply:
.1 All existing surfaces and finishes are to be repaired and refinished wherever damaged during the course of the Work.
.2 Wherever existing floor finishes are to be removed, include full removal down to the existing concrete substrate of all flooring finishes, waterproofing membranes and adhesives in accordance with manufacturer's recommended procedures, ASTM F710-11 "Standard Practice for Preparing Concrete Floors to Receive Resilient Flooring", and TTMAC standards where applicable. Patch, repair and prepare existing substrate to the quality required by the new finish material manufacturer for the installation of their products.

.3 The demolition extents show general intent, the general contractors are required to complete the work in its entirety for the new work associated with the washroom and change room renovations.

.4 All abandoned penetrations through the 2nd floor and walls must patched and sealed. All floor to floor penetrations shall be fire stopped with a 2hr fire resistance rating unless noted otherwise.

1.14

1.15 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.

1.16 "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

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 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^{o} 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

.

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, Port Perry High School, 160 Rosa Street, Port Perry Ontario prepared by Parasol Environmental Inc. dated February 2, 2023

.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 04 22 00 Concrete Unit Masonry

1.3 References

.1 ASTM International (ASTM)
  .1 ASTM A153/A153M-23 Standard Specification for Zinc Coating (Hot-Dip) on Iron and Steel Hardware
.2 CSA Group (CSA)
  .1 CSA A23.1-14/A23.2-14 Concrete Materials and Methods of Concrete Construction / Test Methods and Standard Practices for Concrete.
  .2 CSA S304-14 Design of Masonry Structures.
  .3 CAN/CSA A371-14 Masonry Construction for Buildings.
  .4 CSA G30.3-M1983 (R1998) Cold-Drawn Steel Wire for Concrete Reinforcement.
.3 American Concrete Institute (ACI)
  .1 Detailing Manual
.4 Reinforcing Steel Institute of Canada (RSIC)
  .1 Reinforcing Steel Manual of Standard Practice

1.4 Submittals

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

.2 Submit the following samples:
  .1 Two of each type of masonry reinforcing and connector specified.

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

1.5 Shipping, Handling and Storage

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

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

1.6 Waste Management and Disposal

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

PART 2 PRODUCTS

2.1 Materials

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

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

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

.4 Equivalent products as manufactured by the following manufacturer's may be used subject to submission and acceptance by the Consultant of technical data:
.1 Hohmann and Barnard Inc.

.5 Epoxy Adhesive: Hilti HIT-HY 2270 Adhesive anchor.

2.2 Fabrication

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

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

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

.4 Ship reinforcement clearly identified in accordance with drawings.

PART 3 EXECUTION

3.1 Installation

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

3.2 Reinforcement

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

.2 Reinforcement shall be installed in the first and second bed joints, 200 mm apart immediately above lintels and below sill at openings, and in bed joints at 400 mm vertical intervals elsewhere. Reinforcement in the second bed joint above or below openings shall extend 600 mm beyond the jambs. All other reinforcement shall be continuous except that it shall not pass through vertical masonry control joints. Side rods shall be lapped at least 150 mm at splices.

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

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

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

3.3 Metal Anchors

.1 Do metal anchors as indicated.

3.4 Lateral Support and Anchorage

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

.2 Anchor new masonry to existing with steel dowels as indicated. Drill into existing masonry and set reinforcing bars in epoxy adhesive in accordance with manufacturer's instructions.

3.5 Control Joints

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

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

3.6 Field Bending

.1 Do not field bend reinforcement and connectors except where indicated or authorized by Consultant.

.2 When field bending is authorized, bend without heat, applying a slow and steady pressure.

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

3.7 Field Touch Up

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

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 04 05 19 Masonry Anchorage and Reinforcing
.2 Section 07 92 00 Joint Sealants
.3 Section 09 91 23 Interior Painting

1.3 References

.1 ASTM International (ASTM)
  .1 ASTM C129-22 Standard Specification for Nonloadbearing Concrete Masonry Units
  .2 ASTM C150/C150M-22 Standard Specification for Portland Cement
  .3 ASTM C207-18 Standard Specification for Hydrated Lime for Masonry Purposes.
  .4 ASTM D2240-15(2021) Standard Test Method for Rubber Property—Durometer Hardness.
  .5 ASTM D5249-10(2021) Standard Specification for Backer Material for Use with Cold and Hot Applied Joint Sealants in Portland Cement Concrete and Asphalt Joints.
.2 CSA Group (CSA)
  .1 CSA A23.1-14/A23.2:19 Concrete Materials and Methods of Concrete Construction / Test Methods and Standard Practices for Concrete.
  .2 CSA A165 Series-14 (R2019) CSA Standards on Concrete Masonry Units.
  .3 CSA A179-14 (R2019) Mortar and Grout for Unit Masonry
.3 Canadian Concrete Masonry Producers Association (CCMPA) Quality Assurance Program.

1.4 Submittals

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

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

.3 Submit shop drawings for all masonry reinforcing. Include placing drawings, bar lists and details. Indicate clearly reinforcing bar sizes, spacing, bending details, lap details, dowels to adjacent construction location and quantities of reinforcement and connectors.

1.5 Quality Assurance

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

1.6 Shipping, Handling and Storage

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

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

.3 Materials shall be kept clean and dry.

.4 Deliver cement, lime and mortar ingredients with manufacturer's seal and labels intact.
.5 Cementitious material and aggregates shall be stored in accordance with the requirements of CSA A23.1.

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

1.7 Project Conditions

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

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

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

1.8 Waste Management and Disposal

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

PART 2 PRODUCTS

2.1 Materials

.1 Masonry Units: Concrete Block: Modular, conforming to CCMPA requirements and CSA A165.1.
  .1 H/15/A/M concrete, masonry units, at all other locations unless noted otherwise.
  .2 Special shapes: provide special shapes indicated or required including bullnose and corner blocks, base blocks, fillers, and the like as may be required. Provide purpose made shapes for lintels and bond beams.
  .3 Exposed block shall all be made by one manufacturer and shall be uniform in colour, shade and texture.

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

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

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

.5 Grout: to CSA A179, Table 3: Premixed, non-shrink non-metallic grout.

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

2.2 Mixes

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

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

.3 Take representative samples for testing consistency of strength and colour according to CSA A179.

PART 3 EXECUTION

3.1 Examination

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

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

3.2 General

.1 Do masonry work in accordance with CSA A371 except where specified otherwise.

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

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

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

3.3 Installation

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

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

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

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

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

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

.7 Bond intersecting block walls in alternate courses.

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

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

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

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

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

3.4 Exposed Masonry

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

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

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

.4 Provide bullnose block at all exposed masonry corners.

3.5 Tolerances

.1 Tolerances in notes to Clause 5.3 of CSA A371 apply.

3.6 Reinforcement

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

Control Joints

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

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

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

3.7 Temporary Wall Bracing

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

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

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

3.8 Built-ins

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

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

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

3.9 Protection

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

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

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

3.10 Cleaning

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

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

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

End of Section

PART 1 GENERAL

1.1 General

.1 Conform to the requirements of Division 1.

1.2 Related Sections

.1 Section 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 05 12 23 Structural Steel
.5 Section 06 10 00 Rough Carpentry
.6 Section 06 20 00 Finish Carpentry
.7 Section 06 61 16 Solid Surfacing
.8 Section 09 21 23 Interior Painting

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-12 Standard Specification for Pipe, Steel, Black and Hot Dipped, Zinc Coated, Welded and Seamless.
  .2 ASTM A123/A123M-12 Standard Specification for Zinc (Hot Dip Galvanized) Coatings on Iron and Steel Products.
  .3 ASTM A153/A153M-16 Standard Specification for Zinc Coating (Hot-Dip) on Iron and Steel Hardware
  .4 ASTM A264-12(2019) Standard Specification for Stainless Chromium-Nickel Steel-Clad Plate
  .5 ASTM A269/A269M-15a Standard Specification for Seamless and Welded Austenitic Stainless Steel Tubing for General Service
  .6 ASTM A276/A276M-17 Standard Specification for Stainless Steel Bars and Shapes
  .7 ASTM A307-10 Standard Specification for Carbon Steel Bolts and Studs, 60 000 PSI Tensile Strength.
  .8 ASTM A312/A312M-18a Standard Specification for Seamless, Welded, and Heavily Cold Worked Austenitic Stainless Steel Pipes
  .9 ASTM A380/A380M-17 Standard Practice for Cleaning, Descaling, and Passivation of Stainless Steel Parts, Equipment, and Systems
  .10 ASTM A511/A511M-16 Standard Specification for Seamless Stainless Steel Mechanical Tubing and Hollow Bar
  .11 ASTM F593-17 Standard Specification for Stainless Steel Bolts, Hex Cap Screws, and Studs
  .12 ASTM F594-09(2015) Standard Specification for Stainless Steel Nuts
  .13 ASTM A325 - 04 Standard Specification for Structural Bolts, Steel, Heat Treated, 120/105 ksi Minimum Tensile Strength
  .14 ASTM A385/A385M-15 Standard Practice for Providing High-Quality Zinc Coatings (Hot-Dip)
  .15 ASTM A1008/A1008M-12 Standard Specification for Steel, Sheet, Cold Rolled, Carbon, Structural, High Strength Low Alloy, High Strength Low Alloy with Improved Formability, Solution Hardened, and Bake Hardenable
  .16 ASTM A1011/A1011M-12a Standard Specification for Steel, Sheet and Strip, Hot-Rolled, Carbon, Structural, High-Strength Low-Alloy, High-Strength Low-Alloy with Improved Formability, and Ultra-High Strength
  .17 ASTM C1107/C1107M-17 Standard Specification for Packaged Dry, Hydraulic-Cement Grout (Nonshrink)

.18 ASTM D1187/D1187M-97(2011)e1 Standard Specification for Asphalt-Base Emulsions for Use as Protective Coatings for Metal
.19 ASTM D6386-10 Standard Practice for Preparation of Zinc (Hot Dip Galvanized) Coated Iron and Steel Product and Hardware Surfaces for Painting
.20 ASTM F3125/F3125M-15a Standard Specification for High Strength Structural Bolts, Steel and Alloy Steel, Heat Treated, 120 ksi (830 MPa) and 150 ksi (1040 MPa) Minimum Tensile Strength, Inch and Metric Dimensions

.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 G164-18 Hot Dip Galvanizing of Irregularly Shaped Articles.
.3 CSA-S16.1-M Limit States Design of Steel Structures.
.4 CSA S136-12 Cold Formed Steel Structural Members.
.5 CSA W47.1-09 (R2014) Certification of Companies for Fusion Welding of Steel Structures.
.6 CSA W59-18 Welded Steel Construction
.7 CSA W178.1-18 Certification of Welding Inspection Organizations
.8 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.

.8 Canadian Electrical Code.

1.4 Submittals

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

.2 Shop Drawings:
.1 Submit Shop and Erection Drawings for review.
.2 Verify site dimensions before proceeding with shop fabrication and to suit field conditions and field openings.
.3 Show and describe in detail all the work of this Section including large scale detail of members and materials, of connection and jointing details, and of anchorage devices, dimensions, gauges, thicknesses, description of materials, metal finishing, as well as all other pertinent data and information, including type, size and description of all fasteners and anchors.
.4 Indicate connections to building structure.
.5 Shop drawings for all metal fabrications shall be stamped and signed by a Professional Engineer registered in the Province of Ontario. Each submission of the shop drawings shall bear the seal of the Engineer.

.3 Submit duplicate min 300 x 300 mm samples of stainless steel materials in specified finish.

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 metal stair, handrail, guardrail and landing construction and connections to OBC vertical and horizontal live load requirements.

.2 Stairs shall be designed and constructed to safely sustain a live load of 4.8 kPa evenly distributed over treads and landings with a maximum deflection of L/360. Furnish all supporting members required to connect to the building.

.3 Except where specified otherwise, and where required by applicable codes, detail and fabricate stairs to NAAMM Metal Stairs Manual.

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 A325. 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 Sulphur: Commercial Grade for setting of steel posts.

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

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

.11 Gaskets: Noprene, minimum 5.00 mm thick x 25 mm wide.

.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 Stainless Steel

.1 Stainless steel shall be grade and type designated below for each form required:

.1	Plate	ASTM A264	Type 316L
.2	Bar Stock	ASTM A276	Type 316L
.3	Tubing	ASTM A511	Type 316L
.4	Pipe	ASTM A312	Type 316L
.5	Sheet	ASTM A167	Type 316L
.6	Tubing	ASTM A269	Type 316L
.7	Bolts	ASTM A593	Type 316L
.8	Nuts	ASTM A594	Type 316L

.9 Pickle and passivate stainless steel prior to fabrication and installation to remove any latent black steel to ASTM A380.

.2 Stainless Steel Bolts and Nuts: To ASTM F593 and ASTM F594

2.3 Finishes

.1 Primers: All primers for metal fabrications are to be factory applied under the requirements of this Section. Refer to Finish Schedules in Section 09 91 23 for types of primers required for each application.

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

.3 Galvanizing: hot dipped with zinc coating to CAN/CSA G164 or ASTM A123.

.4 Bolts, nuts, washers, iron, and steel hardware components shall be galvanized in accordance with CAN/CSA G164-M or ASTM A153.

.5 Galvanized coatings on products fabricated from rolled, pressed and forged steel shapes, plates, bars and strips: Galvanized after all welding and grinding complete. No welding or grinding of galvanized products allowed.

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

.7 Stainless Steel: NAAMM AMP-504 Finish No. 4.

PART 3 EXECUTION

3.1 General

.1 Fabricate to reviewed shop drawings and in general to details, sizes and materials indicated on drawings and specified herein.

.2 Fabricate work square, true, straight and accurate to required size, with joints closely fitted and properly secured.

.3 Fabricate work complete with all components required for anchoring; bolting or welding to structural frame; standing free or resting in frames or sockets; in a safe and sure manner.

.4 Where possible fit and shop assemble various sections of the work and deliver to site in largest practicable sections. Where shop fabricating is not possible, make trial assembly in shop.

.5 Ensure exposed welds are continuous for length of each joint.

.6 Grind and fill all welds after inspection and acceptance and leave ready for prime painting.

.7 Fill all open joints, depressions, seams with metallic paste filler or by continuous brazing or welding and grind smooth to true sharp arises and profiles.

.8 Fit joints and intersecting members accurately. Make work in true planes with adequate fastenings.

.9 Supply all fastenings, anchors, accessories required for fabrication and erection of work of this Section. Make thread dimensions such that nuts and bolts will fit without re-threading or chasing threads.

.10 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 Prepare galvanized items scheduled to be painted in accordance with the requirements of Section 09 91 23, and ASTM D6386.

.3 Steel to receive a shop or field paint finish shall be cleaned in accordance with Sections 09 91 23 or SSPC SP6, whichever produces a surface which has less rust and mill scale.
.4 Clean steel which is specified to be painted to CISC/CPMA 2-75 in accordance with that Standard.
.5 Clean steel which is specified to receive an organic zinc-filled epoxy primer, or zinc-rich paint, or inorganic zinc primer, in accordance with SSPC-SP 6, Commercial Blast Cleaning.
.6 Clean welds by wire brushing and wash down with clean water, to remove the chemical residues left by the electrodes, prior to painting.

.2 The following surfaces shall not be painted:
.1 Surfaces and edges to be field welded. If painted, remove paint for field welding for a distance of at least two inches on all sides of the joint, to ensure proper fusion of the metal.
.2 The contact surfaces of friction type connections assembled by high strength bolts.
.3 Portions of steel members which are to be encased in or in contact with concrete or masonry.
.4 Galvanized items not specifically indicated to be painted.

.3 Preparation and priming of all metal work which will be exposed to view and which is scheduled to be finish painted, shall be in accordance with the requirements of Section 09 91 23.

.4 All other concealed or unpainted ferrous metal work shall be given one prime paint coat type CGSB 1.40 and in accordance with CISC/CPMA 2-75. Work paint into all corners and all joints. Metal parts in contact shall be primed before shop assembly. Priming damaged during erection or through lack of protection shall be cleaned and touched up.

.5 Use primer unadulterated, as prepared by manufacturer. Paint on dry surfaces, free from rust, scale, grease. Do not paint when temperature is lower than 7 ° C.

.6 Metals in contact with other dissimilar metals, concrete or masonry materials shall be insulated or separated from one another to prevent corrosion, staining or electrolysis by use of bituminous paint.

3.3 Galvanizing

.1 Steel members, fabrications, and assemblies shall be galvanized after fabrication by the hot dip process in accordance with CAN/CSA G164 or ASTM A123.

.2 Galvanizing of architecturally exposed steel shall be completed by a company recognized in the application of High Quality galvanized finishes and in accordance with ASTM A385.

.3 Prepare metals to be galvanized and painted in accordance with requirements of ASTM D6386.

.4 Bolts, nuts, washers, iron, and steel hardware components shall be galvanized in accordance with CAN/CSA G164 or ASTM A153.

.5 Coating Requirements:
.1 Weight: the weight of the galvanized coating shall conform to Table 1 of CAN/CSA G164, ASTM A123 or 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. The integrity of the coating shall be determined by visual inspection and coating thickness measurements.
.3 Adhesion: the galvanized coating shall be sufficiently adherent to withstand normal handling.

3.4 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 Fabricate units from slotted channel framing where indicated.
.2 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 23 -Interior Painting.

3.5 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 Sections 04 22 00.

.5 Lintels shall be prime painted unless otherwise indicated.

3.6 Vanity Support Brackets

.1 Provide supports to vanities and shelves where indicated, constructed of 3.0 mm steel plate with 38 mm wide horizontal and vertical legs formed to profile indicated. Locate supports at end of vanity, as detailed.

.2 Finish: Shop coat primer. Fabrications in wet areas to be shot blasted and painted with zinc rich primer.

3.7 Bench Support Brackets

.1 Provide steel angle and steel post bench support framing and anchors as detailed. All rough edges to be ground smooth.

.2 Steel to be prime painted or galvanized as indicated.

.3 Predrill bench support assemblies for anchor bolts and screws.

3.8 Cubicle Hooks with Rack

.1 Fabricate cubicle hooks and racks as detailed.

.2 Material shall be type 316 brushed stainless steel.

.3 Round over all exposed edges.

.4 Weld all joints in accordance with AWS D1.6.

.5 Anchor to wall with stainless steel expansion anchors at 610 mm centres, staggered.

3.9 Stainless Steel Shelf

.1 Where indicated on Washroom Accessories Schedule provide stainless steel shelf as detailed

.2 Shelf shall be 457mm long x 100mm wide, 1.2mm type 304 stainless steel, satin finish. 19mm return edge; front edge shall be hemmed. Brackets fabricated from 1.6mm stainless steel to match.

.3 Predrill brackets for anchoring as detailed.

3.10 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.

.3 Provide with integrally welded steel strap anchors for embedding in concrete or masonry construction.

3.11 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.

3.12 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.

3.13 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.

3.14 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 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
PORT PERRY H.S- GYM RENOVATION - 160 ROSA ST, PORT PERRY, ON

Schedule 200741
Date Feb 05/25

Door Number	Set Number
D11	1
D125A	2
D125B	3
D128A	4
D128B	4
D128C	4
D128D	4
D128E	4
D129A	5
D129B	6
D139A	7
D139B	7
D150A	8
D150B	8

Rivett Architectural Hardware Ltd.
Hardware Schedule
PORT PERRY H.S- GYM RENOVATION - 160 ROSA ST, PORT PERRY, ON

Schedule 200741
Date Feb 05/25

Set # 1

1 SGLE. DR. # D11 CORRIDOR TO BARRIER FREE WASHROOM 195 LH

1 -965 x 2150 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	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	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	DOOR SIGNAGE	SUPPLIED BY OTHERS
:	:	1	EA	V-1072A-ST/V-1072B-ST INTERCOM	SUPPLIED BY OTHERS

OCC-2-EMR-S-ILL KIT INCLUDES

2 EA BUTTON CM45/4 X 630

2 EA ILLUMINATED BOX CM-54GR

2 EA SIGN CM-54/SE1

CONTROLLER CX-33

2 EA ASSISTANCE REQUESTED CM-AF501SO (RECESSED BOX BY OTHERS)

1 EA POWER CONTROLER CX-PS13 V3

3 SURFACE BOXES CM-34BL

1 EA PUSH TO LOCK BUTTON CM45/8 X 630

1 EA SURFACE BOX CM-43CBL

1 EA DOOR CONTACT CX-MDC

1 EA PUSH FOR EMERGENCY BUTTON CM-450/R12 (RECESSED BOX BY OTHERS)

1 EA TRANSFOMER 24VAC

1 EA SIGN CM-SE21A

MAIN 110v POWER SUPPLY & LOW VOLTAGE WIRING & MOUNTING BOXES TO BE DONE BY ELECTRICAL DIVISION
POWER OPERATOR & ASSOCIATED ACCESSORIES TO BE SUPPLIED & INSTALLED BY HARDWARE SUPPLIER

Set # 2

1 SGLE. DR. # D125A CORRIDOR TO GIRLS CHANGE ROOM 125 x 45 MIN RATED RH

1 -965 x 2150 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	4414 X ME X RH X 24V X 689
:	:	1	EA	KICKPLATE	190S X 152 X 914 X 630

ELECTRICAL DIVISION TO TIE SENTRONIC HOLD CLOSER INTO FIRE PANEL

Rivett Architectural Hardware Ltd.
Hardware Schedule
PORT PERRY H.S- GYM RENOVATION - 160 ROSA ST, PORT PERRY, ON

Schedule 200741
Date Feb 05/25

Set # 3

1 SGLE. DR. # D125B GYMNASIUM 139 TO GIRLS CHANGE ROOM 125 RH

1 -965 x 2150 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 - REG MOUNT	4040XP X 689
:	:	1	EA	SURFACE STOP	904S X 630
				OVERHEAD STOP @ 110 DEG OPEN	
:	:	1	EA	KICKPLATE	190S X 152 X 914 X 630

Set # 4

1 SGLE. DR. # D128A CORRIDOR TO STUDENT WASHROOM 128A RH
1 SGLE. DR. # D128B CORRIDOR TO STUDENT WASHROOM 128B LH
1 SGLE. DR. # D128C CORRIDOR TO STUDENT WASHROOM 128C RH
1 SGLE. DR. # D128D CORRIDOR TO STUDENT WASHROOM 128D RH
1 SGLE. DR. # D128E CORRIDOR TO STUDENT WASHROOM 128E LH

5 -762 x 2150 x 45 x PSF x HMD x 45 MIN RATED

		Qty			
:	:	15	EA	HINGE	BB1168-114 X 101- 626
:	:	5	EA	PRIVACY C/W INDICATOR	L9044 X 03B X OS-OCC X 626
:	:	5	EA	CLOSER	4040XP X 689
:	:	5	EA	WALL STOP	232W X 626
:	:	5	EA	SWEEP	W24S X 3'-0" X 628
:	:	5	EA	KICKPLATE	190S X 203 X 711 X 630
:	:	5	EA	WALL BOXES WITH COVERS	FUTURE USE
:	:	5	EA	CONDUIT WITH PULL STRINGS	FUTURE USE
				CONDUIT & WALL BOXES TO BE ROUGH IN ONLY FOR FUTURE USE	

Set # 5

1 SGLE. DR. # D129A CORRIDOR TO BOYS CHANGE ROOM 129 LH

1 -965 x 2150 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	4414 X ME X LH X 24V X 689
:	:	1	EA	KICKPLATE	190S X 152 X 914 X 630

ELECTRICAL DIVISION TO TIE SENTRONIC HOLD CLOSER INTO FIRE PANEL

Rivett Architectural Hardware Ltd.
Hardware Schedule
PORT PERRY H.S- GYM RENOVATION - 160 ROSA ST, PORT PERRY, ON

Schedule **200741**
Date **Feb 05/25**

Set # **6**

1 SGLE. DR. # D129B GYMNASIUM 139 TO BOYS CHANGE ROOM 129 LH

1 -965 x 2150 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 - REG MOUNT	4040XP X 689
:	:	1	EA	SURFACE STOP OVER	904S X 630
:	:	1	EA	KICKPLATE	190S X 152 X 914 X 630

Set # **7**

1 SGLE. DR. # D139A GYMNASIUM 139 TO TEAM ROOM 1 139A RH
1 SGLE. DR. # D139B GYMNASIUM 139 TO TEAM ROOM 2 139B LH

2 -965 x 2150 x 45 x PSF x HMD x 45 MIN RATED

		Qty			
:	:	6	EA	HINGE	BB1168-114 X 101- 626
:	:	2	EA	CLASSROOM LOCK	L9070P X 03B X 626
:	:	2	EA	CLOSER - REG MOUNT	4040XP X 689
:	:	2	EA	SURFACE STOP OVERHEAD STOP @ 110 DEG OPEN	904S X 630
:	:	2	EA	KICKPLATE	190S X 203 X 914 X 630
:	:	2	EA	LOUVRE	FLDL-UL-16 X 16 X BEIGE

Set # **8**

1 SGLE. DR. # D150A CORRIDOR TO STAFF CHANGE ROOM 150A LH
1 SGLE. DR. # D150B CORRIDOR TO STAFF CHANGE ROOM 150B RH

2 -900 x 2150 x 45 x PSF x HMD x 45 MIN RATED

		Qty			
:	:	6	EA	HINGE	BB1168-114 X 101- 626
:	:	2	EA	PRIVACY C/W INDICATOR	L9044 X 03B X OS-OCC X 626
:	:	2	EA	CLOSER	4040XP X 689
:	:	2	EA	WALL STOP	232W X 626
:	:	2	EA	KICKPLATE	190S X 203 X 863 X 630
:	:	2	EA	SWEEP	W24S X 3'-0" X 628

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 Standard for non-rated applications, Type X for rated applications, 1220 mm wide x maximum practical length, ends square cut, edges tapered with round edge. 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 Resilient drywall furring: 0.5 mm base steel thickness galvanized steel for resilient attachment of gypsum board.

.5 Deflection Track: Bailey Multi-Slot Track MST 250, size to suit studs, and top deflection clips TDC 350 and TDC 587.

.6 Horizontal Flange attachment: Bailey Horizontal Flange Attachment Clip (HFA Clip)

.7 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 CT1: Ceramic Wall Tile: Daltile (American Olean) Color Story Wall 4” x 16”. Up to 10 colours to be selected from full range of offering.
.1 Provide surface bullnose top cove S44D9/4” x 16” where indicated.

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.
  .2 Fire Resistance: Tested per ASTM E119 and listed in the appropriate floor or roof design in the Underwriters Laboratories Fire Resistance Directory

.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: Tarkett iQ Granite 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 Armstrong World Industries
  .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 03 30 00 Cast-in-Place Concrete

1.3 References

.1 ASTM International (ASTM)
  .1 ASTM D638-22 Standard Test Method for Tensile Properties of Plastics
  .2 ASTM D695-23 Standard Test Method for Compressive Properties of Rigid Plastics
  .3 ASTM D2240-15(2021) Standard Test Method for Rubber Property—Durometer Hardness
  .4 ASTM D4541-22 Standard Test Method for Pull-Off Strength of Coatings Using Portable Adhesion Testers
  .5 ASTM F1869-23 Standard Test Method for Measuring Moisture Vapor Emission Rate of Concrete Subfloor Using Anhydrous Calcium Chloride
.2 International Concrete Repair Institute (ICRI)
  .1 ICRI Guideline 310.2

1.4 Submittals

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

.2 Submit manufacturer's product literature and application instructions.

.3 Submit complete range of manufacturer's standard colours.

.4 Provide maintenance data for epoxy flooring for incorporation into Operating and Maintenance Manuals specified in Section 01 78 00- Closeout Submittals.

1.5 Quality Assurance

.1 Obtain primary resinous flooring materials, including primers, from resinous flooring manufacturer. Obtain secondary materials including aggregates, sheet flashings, joint sealants, and substrate repair materials of type and from source recommended by resinous flooring manufacturer.

.2 Resinous flooring manufacturer shall have ISO 9001 Quality Certification.

.3 Mock-Up:
  .1 Prior to commencing epoxy flooring application, prepare a minimum 1.0 x 1.0 metre reference mock-up of each type, colour and texture of resinous flooring surface. Mock-up shall be constructed in location designated by Consultant, using the same equipment, tools and methods for installing all materials as will be used for the remaining work to be performed.
  .2 Once accepted, mock-up is to remain, and is to be protected from damage. It shall become the standard for acceptance of colour and texture for resinous flooring applications.
  .3 When Consultant determines that mockup does not meet requirements, demolish and remove it from the site and cast another until the mockup is accepted.

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 Environmental Limitations: Apply resinous flooring within the range of ambient and substrate temperatures recommended in writing by manufacturer. Do not apply resinous flooring to damp or wet substrates, when temperatures are below 5 ° C, when relative humidity exceeds 70 percent, or when temperatures are less than -15 ° C above dew point.
   .1 Coordinate flooring work with other trades to ensure adequate illumination, ventilation, and dust free environment during application and curing of flooring.

.2 Coordinate flooring work with other trades to ensure adequate illumination, ventilation, and dust free environment during application and curing of flooring.

.3 Conditions for Concrete
   .1 New concrete shall be cured a minimum of 28 days before proceeding.
   .2 Any cementitious repair mortars must have a full 7-day cure prior to coating.

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 Resinous Floor System

.1 Primer:
   .1 Material Basis: Stonhard Standard Primer
   .2 Resin: Epoxy
   .3 Formulation Description: (2) two component, 100 percent solids.
   .4 Application Method: Squeegee and roller
   .5 Number of Coats: (1) one.

.2 Broadcast Media:
   .1 Material Basis: Stonshield quartz aggregate.
   .2 Type: pigmented.
   .3 Finish: standard.
   .4 Number of Coats: (1) one.
   .5 Pattern: Tweed.

.3 Undercoat:
   .1 Material Basis: Stonshield undercoat.

.2 Resin: Epoxy
.3 Formulation Description: (2) two-component, 100% solids, UV Stable.
.4 Type: Clear.
.5 Finish: Gloss.
.6 Number of Coats: (1) one.

.4 Broadcast Media:
.1 Material Basis: Stonshield quartz aggregate
.2 Type: pigmented.
.3 Finish: standard.
.4 Number of Coats: (1) one.
.5 Pattern: Tweed.

.5 Sealer:
.1 Material Basis: Stonkote CE4.
.2 Resin: Epoxy
.3 Formulation Description: (2) two-component, 100% solids, UV Stable.
.4 Type: Clear.
.5 Finish: Gloss.
.6 Number of Coats: one.
.7 Texture level: medium.

.6 Note: Components listed above are the basis of design intent; all bids will be compared to this standard including resin chemistry, color, wearing surface, thickness, and installation procedures, including number of coats. Contractor shall be required to comply with all the requirements of the Specifications and all of the components required by the Specifications, whether or not such products are specifically listed above. Bases of design Stonhard, or approved alternate.

PART 3 EXECUTION

3.1 Examination

.1 Examine substrates, with Applicator present, for compliance with requirements and for other conditions affecting performance of resinous flooring.

.2 For the record, prepare written report, endorsed by Applicator, listing conditions detrimental to performance.

.3 Verify compatibility with and suitability of substrates.

.4 Report, in writing, surfaces left in improper condition by other trades. Application of coating indicates acceptance of surfaces and conditions.

3.2 Surface Preparation

.1 General: Prepare and clean substrates according to resinous flooring manufacturer's written instructions for substrate indicated. Provide clean, dry, and neutral Ph substrate for resinous flooring application.

.2 Concrete Substrates: Provide sound concrete surfaces free of laitance, glaze, efflorescence, curing compounds, form-release agents, dust, dirt, grease, oil, and other contaminants incompatible with resinous flooring or Diamond Grind with a dust free system.

.1 Mechanically prepare substrates as follows:
.1. Shot-blast surfaces with an apparatus that abrades the concrete surface, contains the dispensed shot within the apparatus, and recirculates the shot by vacuum pickup.

.2 Repair damaged and deteriorated concrete according to resinous flooring manufacturer's written recommendations.

.3 Verify that concrete substrates are dry.
.1 Perform in situ probe test, ASTM F 2170. Proceed with application only after substrates do not exceed a maximum potential equilibrium relative humidity of 80 percent.
.2 Perform anhydrous calcium chloride test, ASTM F 1869. Proceed with application only after substrates have maximum moisture-vapor-emission rate of 3 lb of water/1000 sq. ft. of slab in 24 hours.
.3 Perform additional moisture tests recommended by manufacturer. Proceed with application only after substrates pass testing.

.4 Use patching and fill material to fill holes and depressions in substrates according to manufacturer's written instructions.

.5 Treat control joints and other nonmoving substrate cracks to prevent cracks from reflecting through resinous flooring according to manufacturer's written recommendations. Allowances should be included for Stonflex MP7 joint fill material.

3.3 Application

.1 General: Apply components of resinous flooring system according to manufacturer's written instructions to produce a uniform, monolithic wearing surface of thickness indicated.
.1 Coordinate application of components to provide optimum adhesion of resinous flooring system to substrate, and optimum intercoat adhesion.
.2 Cure resinous flooring components according to manufacturer's written instructions. Prevent contamination during application and curing processes.
.3 At substrate expansion and isolation joints, provide joint in resinous flooring to comply with resinous flooring manufacturer's written recommendations.
.1 Apply joint sealant to comply with manufacturer's written recommendations.

.2 Apply primer where required by resinous system, over prepared substrate at manufacturer's recommended spreading rate.

.3 Integral Cove Base: Stonshield cove mortar, apply cove base mix to wall surfaces before applying flooring. Apply according to manufacturer's written instructions and details including those for taping, mixing, priming, troweling, sanding, of cove base. Round internal and external corners.

.1 Integral Cove Base: 4 inches high.

.4 Apply primer where required by resinous system, over prepared substrate at manufacturer's recommended spreading rate.

.5 Broadcast: Immediately broadcast quartz silica aggregate into the primer using manufacturer's specially designed spray caster. Strict adherence to manufacturer's installation procedures and coverage rates is imperative.

.6 Undercoat: Remove any surface irregularities by lightly abrading and vacuuming the floor surface. Mix and apply undercoat with strict adherence to manufacturer's installation procedures and coverage rates.

.7 Broadcast: Immediately broadcast quartz silica aggregate into the undercoat using manufacturer's specially designed spray caster. Strict adherence to manufacturer's installation procedures and coverage rates is imperative.

.8 Apply topcoat(s) in number of coats indicated for flooring system and at spreading rates recommended in writing by manufacturer.

3.4 Cleaning, Curing and Protection

.1 Cure resinous flooring materials in compliance with manufacturer's directions, taking care to prevent contamination during stages of application and prior to completion of curing process. Close area of application for a minimum of 24 hours.

.2 Protect resinous flooring materials from damage and wear during construction operation. Where temporary covering is required for this purpose, comply with manufacturer's recommendations for protective materials and method of application. General Contractor is responsible for protection and cleaning of surfaces after final coats.

.3 Cleaning: Remove temporary covering and clean resinous flooring just prior to final inspection. Use cleaning materials and procedures recommended by resinous flooring

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 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 and change rooms)
.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 05 50 00 Metal Fabrications
.2 Section 10 28 10 Toilet and Bath Accessories

1.3 References

.1 ASTM International (ASTM)
  .1 ASTM A480/A480M-23 Standard Specification for General Requirements for Flat-Rolled Stainless and Heat-Resisting Steel Plate, Sheet, and Strip
  .2 ASTM E84-24 Standard Test Method for Surface Burning Characteristics of Building Materials
.2 CSA Group (CSA)
  .1 CSA/ASC B651:23 Accessible Design for the Built Environment.
.3 American National Standards Association (ANSI)
  .1 ANSI/NEMA LD 3-2005 High-Pressure Decorative Laminates (HPDL)
.4 Underwriters Laboratories of Canada (ULC)
  .1 CAN/ULC-S102 Surface Burning Characteristics of Building Materials and Assemblies
.5 Accessibility for Ontarians with Disabilities Act (AODA)

1.4 Submittals

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

.2 Product Data:
  .1 Submit manufacturer's printed product literature for toilet partitions or components, specifications and datasheet and include product characteristics, performance criteria, physical size, finish and limitations.
  .2 Submit duplicate copies of manufacturer’s standard colour charts for selection by the Consultant.

.3 Shop Drawings:
  .1 Shop drawings: Indicate partition layout.
  .2 Show and describe in detail materials, finishes, dimensions, details of connections and fastenings, elevations, plans, sections, thicknesses, metal thickness, hardware and any other pertinent information.

.4 Samples:
  .1 Submit duplicate 300 x 300 mm samples of panel showing finish on both sides, two finished edges and core construction.
  .2 Submit duplicate representative samples of each hardware item, including brackets, fastenings and trim.

.5 Quality Control Submittals: submit following in accordance with Section 01 45 00 - Quality Control.
  .1 Manufacturer's Instructions: submit manufacturer's installation instructions and special handling criteria, installation sequence and cleaning procedures.

.6 Closeout Submittals:
  .1 Provide maintenance data for plastic toilet compartments 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.

.3 Protect finished surfaces during shipment and installation. Do not remove until immediately prior to final inspection.

1.6 Waste Management and Disposal

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

1.7 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 Approved Manufacturers

.1 Compartments and cubicles as manufactured by the following may be used subject to approval of product specifications and details by the Consultant:
.1 EAD Design
.2 Bobrick Washroom Equipment of Canada Ltd.
.3 Bradley Corporation

2.2 Design

.1 Solid phenolic core ceiling hung change cubicles with operational full height vandal resistant hardware, gap free.
.1 Change cubicles shall have acrylic frosted panel above door as indicated.
.2 Standard of acceptance: EAD BRIO.

.2 Supply and install all required change cubicles complete with all required hardware and accessories.

.3 All cubicles shall have gap free design with zero sight lines.

.4 Colours will be selected by the Consultant from the manufacturer's standard range of colours. Up to four colours will be selected.

2.3 Materials

.1 Materials shall meet NFPA Class B, UBC Class II, CAN/ULC S102 Fire resistance standards as follows:
.1 Flame Spread Index: 45 for panels and stiles.
.2 Smoke Developed Index: 120 for panels, 95 for stiles.
.3 Class B.

.2 Solid phenolic material for stiles, panels, doors and screens.
.1 Phenolic Construction: Solidly fused high pressure laminate with matte-finish melamine surfaces; integrally bonded coloured face sheets and black phenolic-resin core.
.2 Phenolic Edges: Black; brown edges not acceptable.

.3 Finished Thickness:
.1 Stiles and Doors: 19 mm
.1 Finished thickness of doors and stiles to ensure flush front.
.2 Panels and Screens: 13 mm

2.4 Hardware

.1 Stiles: Floor-Anchored stiles furnished with expansion shields and threaded rods.
.1 Leveling Devices: 5 mm thick, corrosion-resistant, chromate-treated, double zinc-plated steel angle leveling bar bolted to stile; furnished with 10 mm diameter threaded rods, hex nuts, lock washers, flat washers, spacer sleeves, expansion anchors, and shoe retainers.
.2 Stile Shoes: One-piece, 0.8 mm, 18-8, Type 304 stainless steel, 102 mm height; tops with 90 degree return to stile. One-piece shoe capable of adapting to 19 mm or 25 mm stile thickness and capable of being fastened (by clip) to stiles starting at wall line.

.2 Compliance: Operable with one hand, without tight grasping, pinching, or twisting of the wrist, and force to operate does not exceed five pounds. Door pull: Barrier-free type suited for out-swinging doors, stainless steel. Conform to AODA and Ontario Building Code requirements.

.3 Emergency Access: Hinges, latch allow door to be lifted over keeper from outside compartment.

.4 Materials: 18-8, Type 304, heavy-gauge stainless steel with satin finish. Chrome-plated "Zamak", aluminum, or extruded plastic hardware not acceptable.

.5 Fastening: Hardware secured to door and stile by through-bolted, theft-resistant, pin-in-head Torx stainless steel machine screws into factory-installed, threaded brass inserts. Fasteners secured directly into core not acceptable.

.6 Threaded Brass Inserts: Factory-installed; withstand direct pull force exceeding 680 kg per insert.

.7 Mounting: Hinges, keepers, latches and their fasteners concealed inside compartment. Exposed hinges, keepers, latches, clothes hooks and their fasteners on exterior of compartment not acceptable with the exception of accessible compartments.

.8 Hardware Type: Institutional hardware (Bobrick Type .67 or equivalent).

.1 Hinges
.1 Ultra-robust hinges for standard stalls (3 per door), type 304 #4 finish, 16 gauge stainless steel, for interior-opening doors, ***invisible from the outside***. Adjustable gravity-controlled closing mechanism. Mechanism made from high-density nylon. Model provides door-lifted emergency access. EAD product # 900-010 or 900-011.
.2 Ultra-robust hinges for handicap stalls (3 per door), type 304 #4 finish, 16 gauge stainless steel, for exterior-opening doors, ***visible from the exterior***. Adjustable automatic gravity-controlled closing mechanism. Mechanism made from high-density nylon. Model provides door-lifted emergency access. EAD product # 900-010 ou 900-011

.2 Door bolts and latches
.1 Type 304 #4 finish, 11 gauge stainless steel bolts and latches for standard and handicap

stalls, ultra-robust. Door bolt with handle and 2 integrated shock-absorbers. The latch has a door stopper. EAD product # 900-100/900-101

.3 Door handles
.1 Type 304 # 4 finish, 11 gauge stainless steel D-shaped handles for handicap stalls, in compliance with .2.6.1 et 5.2.2.d, .e, CAN/CSA-B651-95 norms. EAD product # 900-111/900-113.]
.4 Type 304 #4 finish 18 gauge stainless steel pilaster shoes, invisible from the exterior and proportionate in width to pilaster width. EAD product # 150
.5 Support and full-length anodized aluminum joining profiles 6063 alloy, #5 clear anodized coating, 10 microns. EAD product.

2.5 Fabrication

.1 Shop fabricate partitions and screens. Take site measurements for areas where partitions are to be located and fabricate partitions to suit site dimensions.

.2 Fabricate to reviewed shop drawings and manufacturer's standards.

.3 Change Cubicle Doors and Partitions:
.1 Doors 2150mm high, Panels 2500mm +/- high (site verify for fully height, Acrylic frosted transom 221mm high

.4 Intimacy
.1 'No-Sightline'-style privacy protector : a black polypropylene felt strip provides privacy on both sides of the partition door.]
.2 Interlocking pilasters: Doors and pilasters interlock such that there is greater privacy by preventing inside view of the stall.

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 Check areas scheduled to receive compartments for correct dimensions, plumbness of walls, and soundness of surfaces that would affect installation of mounting brackets.

.2 Verify spacing of plumbing fixtures to assure compatibility with installation of compartments.

.3 Do not begin installation of compartments until conditions are satisfactory.

3.3 Installation

.1 Ensure supplementary anchorage including ceiling support framing is in place.

.2 Do work in accordance with CSA-B651.

.3 Install products in strict compliance with manufacturer's written instructions and recommendations, including the following:
.1 Verify blocking and supports in walls and ceilings have been installed properly at points of

attachment.
.2 Verify location does not interfere with door swings or use of fixtures.
.3 Use fasteners and anchors suitable for substrate and project conditions
.4 Install units rigid, straight, plumb, and level.
.5 Conceal evidence of drilling, cutting, and fitting to room finish.
.6 Test for proper operation.

.4 Change cubicles and partitions shall be custom manufactured to restrict sight lines and shall be mounted with bottom of partition tight to floor for zero sight line at the bottom. Provide full height brackets, angles and stops to prevent sight lines into cubicles.

.5 Adjust hardware for proper operation after installation. Set hinge cam on in-swinging doors to hold doors open when unlatched. Set hinge cam on out-swinging doors to hold unlatched doors in closed position.

3.4 Cleaning

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

.2 Touch-up, repair or replace damaged products.

.3 Clean exposed surfaces of compartments, hardware, and fittings.

.4 On completion and verification of performance of installation, remove surplus materials, excess materials, rubbish, tools and equipment.

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

SECTION 26 05 01: COMMON WORK RESULTS - ELECTRICAL.

PART I - GENERAL

1.1 Reference:

1. This section forms part of every section of Division 26.

1.2 Access Doors:

1. Not Required.

1.3 Cleaning:

1. Clean devices and other surfaces that have been exposed to construction dust and dirt. Clean the insides and outsides of panels and other electrical equipment and completely remove all debris and tools from the project.

1.4 Codes and Standards:

1. Complete the installation of the work in accordance with latest editions of the Ontario Building Code, Electrical Safety Code, CSA, ULC, NFPA or other codes, as required.
2. Comply with Electrical Bulletins in force at time of Bid submission. While not identified and specified by number in this Division, they are to be considered as forming part of related Standards.
3. Abbreviations for electrical terms are as per CSA Z85.

1.5 Finishes:

1. All shop finished metal equipment and enclosure surfaces, must be prepared by removal of rust and scale from the raw metal, degreasing, cleaning, application of rust resistance primer inside and outside, and at least two coats of finish enamel paint. Use factory standard colours unless otherwise specified. Colour reference numbers are Sico.
2. Paint exterior surfaces of indoor electrical equipment to manufacturer's standard.
3. Clean and touch-up (to Consultant's acceptance) surfaces of shop-finished equipment that is scratched or marred during shipment or installation, so as to match original paint.
4. Leave with the Owner, 0.22 gal. of paint of each colour used, in the form of liquid or spray, to allow for future touch-up of damaged areas.

1.6 Inserts, Hangers and Sleeves:

1. Provide hangers, inserts, sleeves and supports as required.
2. Inserts are to be of lead shield type.
3. Hangers must not be welded to structural steel members and burning of holes in structural steel is prohibited.
4. Sleeves are to be of a type suitable for the application and be sealed and made watertight. Sleeves through concrete shall be sized for free passage of conduit, and installed flush with underside of concrete slab and extend 100mm (4") above finished floor unless otherwise shown.

1.7 Intent:

1. It is the intent of these drawings and specifications that the Contractor provide complete and operational systems as required.
2. Where differences occur, the maximum condition shall govern.
3. Any miscellaneous items, hardware, devices, wiring, etc., not specifically described, but required for the operation of the system, must be provided and included as part of the Bid.

1.8 Mounting Heights:

1. Mounting height of equipment is from finished floor to center line of equipment unless specified or indicated otherwise.
2. If mounting height of equipment is not indicated, verify with Consultant before proceeding with installation.

1.9 Owners Instruction and Trial Usage:

1. Instruct the Owner's operating personnel in the startup, operation, care and maintenance of all the equipment. All equipment to be tested, operational and commissioned before instruction. Provide sheets for signatures of Owner's representative and operating personnel present at each instruction period.
2. Arrange and pay for the service of the manufacturer's factory service Engineer/Technician to supervise the start-up of his equipment installation, and to check, adjust, balance and calibrate components.
3. Provide these services for such period, and for as many visits as necessary to ensure that the Owner's operating personnel are conversant with all aspects of its care and operation.
4. When commissioning is included in the contract:

    1. Prior to any instruction sessions, commissioning coordinator shall submit check lists of each system or equipment indicating their operation status for acceptance by the Owner.
    2. Coordinate all instruction sessions to suit Owner's operation personnel schedule. Submit proposed instruction session schedule c/w training agenda three weeks prior to session start date to Owner for review.

5. The Owner's operating personnel must be permitted to operate the systems under the contractor's supervision for a reasonable period of time prior to Substantial Completion of Contract. This use shall not be misconstrued as acceptance of the equipment.

1.10 Plywood Backboard:

1. Supply and install all plywood backboards required for the work of this Division. Plywood to be highest quality fire retardant fir. 1200 mm wide x 2400 mm high (4'-0" wide x 8'-0" high), 19mm (3/4") thick unless otherwise specified. Prime and paint backboards on both sides with fire retardant paint, equal to CGSB spec. #1-GP-151M, of a colour to match the equipment and services mounted thereon as defined in "Finishes" above. **Do not paint over fire rated stamps.**

2. Plywood backboards are to be provided for mounting the following surface wall mounted equipment:
    - Cabinets.
    - Contactors.
    - Control Panels
    - Disconnect Switches.
    - Junction Boxes 600mm (2') square and larger.
    - Pull Boxes.
    - Panel Boards.
    - Splitters
    - Transient Voltage Surge Suppression Units.
    - External Breakers

3. Where practical, group devices on a common backboard.

1.11 Protection:

1. Protect exposed live equipment during construction for personnel safety.

2. Shield and mark live parts “LIVE 600 VOLTS”, or with appropriate voltage in English.

1.12 Sealing:

1. Where cables or conduits pass through non fire-rated floors, walls or roof, provide internal and external sealing thereto.
2. Retain the service of a specialty sealant contractor for the work required.
3. Comply with manufacturer’s installation instructions for all sealant applications.
4. For non-fire rated locations, Sealant shall be silicone, that meets requirements of CGSB 19-GP-23, for the size of the joint required, and the types of materials being bonded.
5. For fire rated locations, the fire stop shall meet the requirements of UL with regards to the type of assembly and the fire separation.
6. Provide architecturally approved air barrier seals and vapor barrier seals to electrical items passing through or terminating within walls, roofs and decks, humidity controlled areas and pressurized areas.
7. All materials used for fire stopping of penetrations must be Hilti Limited manufactured product only.

1.13 Sprinkler Proofing:

1. All areas of this building are protected by a wet sprinkler system. **All electrical equipment** to be configured for installation in such an environment.

1.14 Warning Signs:

1. Provide warning signs, as specified to meet requirements of Department of Labor Safety Inspection, Inspection Department, Authorities having jurisdiction and Consultant.
2. Use decal signs, in English minimum as required by Authorities.

1.15 Wire Pulling Lubricant:

1. Lubricant to be non-corrosive and NFPA 70 approved for the type of cable used.
2. Lubricants to be soap or wax based, depending upon application. Use soap based for short runs and for semi-conducting insulated wires, and wax based for long runs.

End of Section

SECTION 26 05 20: WIRE AND BOX CONNECTORS (0-1000V).

PART I - GENERAL

1.1 Work Included:

1. Provide all wire and box connectors required for a complete electrical system installation.

PART II - PRODUCTS

2.1 Materials:

1. Pressure type wire connectors are to be manufactured to CSA C22.2 No.65. Clamps and connectors are to be manufactured to CSA C22.2 No. 18.
2. Building Wire Connectors shall be:
    1. For wire sizes up to #6 AWG - Ideal “Wing Nut” or Gardner - Bender “Wing Gard”.
    2. For Wire Sizes #4 AWG and larger:
        - End to end splices - Burndy YS.
        - Parallel splices - Burndy YC & YH (CU) or YHO & YHD (CU / AL).
        - At studs and bus bars - Burndy YA (CU) or YA-A (CU / AL).
        - Two or three conductors in parallel - Burndy KA-U (CU / AL).
3. Cable connectors shall be:
    1. For armored TECK cables, watertight type, with open compounded head - T&B series “Spin-on 2” with corrosion resistant boot.
    2. For armored cables steel type with nylon insulated throat - T&B “TITE-Bite”.
    3. Clamps or connectors for armored cable, flexible conduit non-metallic sheathed cable shall be as required.

PART III - EXECUTION

3.1 Installation:

1. Remove insulation carefully from ends of conductors and:
    1. Install connectors and tighten as recommended by manufacturer.
       Installation shall meet secureness tests in accordance with CSA C22.2 No.65.
2. Install bushing stud connectors in accordance with NEMA 1Y-2.

End of Section

SECTION 26 05 21: WIRE AND CABLES.

PART 1 - GENERAL

1.1 Work Included:

1. Provide building wire as detailed below and as required for a complete electrical installation.

PART II - PRODUCTS

2.1 Materials

1. Wire in Conduit:
    1. Conductor material to be annealed commercial grade, copper, 98 percent conductivity, up to #10 AWG solid, with RW90 insulation, #8 and larger, stranded, with RW90 insulation, unless noted otherwise, 300V rating for fire alarm, security and other low voltage circuits, 600V rating for 120 / 208V circuits, 1000V rating for 230 / 400V circuits, 1000V rating for 277 / 480V circuits, 1000V rating for 347 / 600V circuits.

    2. Colour Coding (must be approved by ESA Field Inspector):

        1. Two conductor, 1 phase: 1 black, 1 white
           Three conductor, 1 phase: 1 red, 1 black, 1 white
           Three conductor, 3 phase: 1 red, 1 black, 1 blue
           Four conductor, 3 phase: 1 red, 1 black, 1 blue, 1 white

        2. Ground wires: green.

    3. Low voltage Armored Cables Type AC-90:

        1. Type to be AC-90, Multi-conductor, with solid, annealed commercial grade 98 percent conductivity tinned copper conductors and cross-linked polyethylene with R90 insulation, 600 volt rating, on #10 and #12 size only.

        2. Colour Coding:

           Two conductor, 1 phase: 1 black, 1 white
           Three conductor, 1 phase: 1 black, 1 red, 1 white

        3. Grounding to be uninsulated, solid copper, with impregnated paper separator.

    4. Low voltage Armored Cables - TECK:

        1. Type to be TECK, single conductor with annealed. Class B, stranded copper conductors and cross linked polyethylene, RW90 insulation, 1000 volt rating for #8 AWG and larger.

        2. The inner and outer jackets to be PVC “Flamenol” suitable for –40˚C, with mylar tape separator and aluminum strip, armour helically wound and interlocked.

5. Two Hour Fire Rated Cable - Mineral Insulated

    1. Mineral Insulated Cables:

        1. Mineral insulated cables shall be manufactured to CSA C22.2 No. 124.

        2. Conductors are to be solid, bare, soft annealed copper, sized as required.

        3. Insulation to be compressed powdered magnesium oxide, to form compact homogeneous mass throughout entire length of cable.

        4. Overall covering to be annealed seamless copper sheath, type LW MI, rated 600 volt, 250°C.

PART III - EXECUTION

3.1 Installation:

1. General:
    1. Wire shall be installed in conduit and sized for the connected load(s) and protection as required, unless otherwise specified.
    2. Provide a dedicated #12AWG neutral from panel board to wiring devices ran with each of Phase ‘A’,’ B’,’ C’ conductors (ie: dedicated neutral per phase). Minimum power conductor wire size shall be #12 AWG.
    3. Minimum power conductor wire size shall be #12 AWG, unless otherwise stated. Home runs in excess of 30 m (90’) for circuits protected by a 15A over current device, shall be #10 AWG.
    4. The current carrying capacity of the feeders, subfeeders and branch circuit conductors shall be sized to equal or better than shown on the drawings. If wire or cable sizes with equivalent current carrying capacity other than that specified is used, ensure that the voltage drop shall not be more than 2%.
    5. The number of wires indicated for various systems is intended to show the general scheme only. The required number and type of wires shall be installed in accordance with the manufacturer’s diagrams and with the requirements of the installation.
2. Wire in Conduit:
    1. Provide pigtails at all outlets for wiring devices. All neutrals and branch circuits shall be connected in each outlet box to avoid a break in the neutral or the circuit wire when fixture or wiring device is disconnected.
    2. At each junction, pull and outlet box make a 360 degree loop of the stripped uncut ground conductor under the ground screws.
3. Low Voltage Armored Cables - (Feeders):
    1. Do not directly bury in or below concrete slabs or walls.
    2. Do not encircle single conductor cable with ferrous metal.
    3. No splices will be permitted.
    4. Single conductors of the three or four wire circuit shall be run with uniform spacing of not less than one cable diameter throughout the feeder length.
    5. Use wood throated cable clamps to ensure proper and uniform cable spacing.
    6. Where cables are installed on walls, provide mechanical protection over them up to 2.4m (8’) above finished floor, using a 12 gauge U section aluminum cover.
    7. Cable connections to all enclosures, boxes and panels shall be by means of a watertight malleable aluminum connector.

4. Mineral Insulated Cable:
    1. Run cable exposed as required, securely supported by straps.
    2. Make cable terminations by using factory made kits.
    3. Use thermoplastic sleeving over bare conductors at cable terminations.
    4. Do not splice cable.
    5. MI cables must be rigidly supported at maximum spacing of 1m (3’). Do not use aluminum products for support.
    6. MI cables shall be used for emergency system feeders and branch circuits requiring a one (1) hour fire rating.

End of Section

SECTION 26 05 27.00: GROUNDING

PART I - GENERAL

1.1 Work Included:

1. Provide all grounding to conform with the Canadian Electrical Code and the latest instructions of the Inspection Authority, with any further requirements as noted herein.

PART II - PRODUCTS

2.1 Materials:

1. All grounding conductors stranded copper, bare or insulated as indicated on Drawings or in Specifications.
2. All ground wires are to be FT-4 rated factory green. Green tape, spray paint or any other means to alter the colour of the conductor is not permitted.
3. Use Cadweld or Burndy Thermoweld process for all weld connections. AMP of Canada Ltd. Wrench-Lok grounding connectors are an acceptable equivalent to welded connections.
4. All ground connectors to be designed and approved for grounding purposes.

PART III - EXECUTION

3.1 Installation:

1. Ground all conduit, and all non-current carrying metal parts, equipment cases, frames, bases, brackets, etc.
2. Grounding of all trays, AFCRs, racks, cabinets, etc. provided by the electrical contractor.
3. Ground each piece of fixed equipment back to the panel feeding that equipment, by one of the following methods:

    1. Conduit shall **not** be utilized for the ground return conductor.
    2. Where the conduit is flexible, install a separate bare soft drawn copper ground inside the conduit. At the switchboard or distribution panel, provide a grounding bushing, loop the ground conductor through the bushing, and connect to the switchboard ground bus. At the fixed equipment, connect to an internal ground bus, or connect to the inside of the metal enclosure utilizing approved screws and connectors (remove all paint).
    3. Run a separate (dedicated) insulated ground wire in all conduits to all devices and fixtures.
    4. Where equipment is fed by a multi-conductor power cable, provide a ground conductor in the cable. At the switchboard or panel, connect to the ground bus. Use a grounding connector on the cable for positive grounding of the metallic sheath. Loop the ground wire to the grounding connector.
    5. Run a separate ground wire in all flexible conduits. Connect each end to ground bus or lug or connector.
    6. Where mechanical protection is required for insulated grounding conductors install in rigid conduit.
    7. Provide weld connection or wrench type grounding connectors for:
    All connections between grounding conductors.
    All connections to building steel.
    All connections between grounding conductors and cable lugs.
    8. Arrange grounding to provide the minimum impedance paths for ground fault currents. Provide any additional grounding required for approval by the inspecting authorities.

3.2 Equipment Grounding

1. Install grounding connections to typical equipment including non-current carrying metal parts of transformers, generators, motors, circuit breakers, cable sheaths, raceways, pipe work, screen guards, switchboards, meter and relay cases, any exposed building metal and building structural steel.

End of Section

SECTION 26 05 29: HANGERS AND SUPPORTS FOR ELECTRICAL SYSTEMS:

PART I - GENERAL

1.1 Work Included:

1. Provide Hangers and Supports for Electrical Systems as required for a complete electrical system installation.

PART II - PRODUCTS

2.1 Support Channels:

1. U shape pre-galvanized steel, size 41 mm x 41 mm x 22 mm (1-5/8” x 1-5/8” x 7/8”), for surface mounting, suspending, or inserting into poured concrete walls and ceilings as required.
2. All channel fittings to suit channel type.
3. All other fittings to suit equipment weight, location and surface as required.

PART III - EXECUTION

3.1 Installation:

1. Secure plywood backboards, channels, luminaires, equipment and fittings to wood with wood screws, to solid masonry, tile and plaster surfaces with lead anchors, to poured concrete with self-drilling expandable inserts, and to hollow masonry walls with toggle bolts.
2. All ceiling mounted equipment shall be independently supported from the structure. Do not support equipment from ceiling support system.
3. Support equipment, conduit or cable using clips, spring loaded bolts, or cable clamps designed as accessories to basic channel members.
4. Fasten exposed conduit or cables to building using:
    1. Two-hole steel straps to secure surface conduits and cables 50 mm (2”) and smaller.
    2. Two-hole steel straps for conduits and cables larger than 50 mm (2”).
    3. Beam clamps to secure conduit to exposed steel work.
5. For suspended support system:
    1. Support individual cable or conduit runs with 6 mm (1/4”) diameter threaded rods and spring clips.
    2. Support two or more cables or conduits on channels support by 6 mm (1/4”) diameter threaded rod hangers where direct fastening to building construction is impractical.
    3. Support suspended luminaire using two or more lengths of Weldless “Single Jack”, bright zinc plated steel chain, American Standard #10 gauge, 13 links per foot.
6. Provide metal brackets, frames, hangers, clamps and related type of support structure where indicated or as required to support conduit and cable runs.
7. Ensure adequate support for raceways and cables dropped vertically to equipment where there is no wall support.
8. Do not use wire lashing or perforated strap to support or secure raceways or cables.
9. Do not use supports or equipment installed for other trades for conduit or cable support except with permission and approval of Consultant.
10. Install Hangers and Supports for Electrical Systems as required for each type of equipment, cable and conduits, and in accordance with manufacturer’s installation recommendations.

End of Section

SECTION 26 05 31: SPLITTERS, JUNCTION BOXES, PULL BOXES AND CABINETS.

PART I - GENERAL

1.1 Work Included:

1. Provide splitters, junction boxes, pull boxes and cabinets as shown on the drawings and as required for a complete electrical installation.

PART II - PRODUCTS

2.1 Splitter Troughs:

1. Splitter trough construction is to be based on CSA C22.2 No. 76.
2. They shall have sheet steel enclosure, with welded corners and formed hinged cover suitable for locking in closed position.
3. Connection bars are to match required size and number of incoming and outgoing conductors as indicated.
4. Provide at least three spare terminals on each set of lugs in splitter troughs less than 400A and feed through lugs where required.
5. Provide double lugs for neutrals where required.
6. Enclosures shall be CSA/EEMAC Type 1 modified to sprinkler proof enclosure.

2.2 Junction and Pull boxes.

1. Junction and pull boxes construction is to be based on CSA C22.2 No. 40.
2. They shall be suitable for surface mounting and be of welded steel construction with screw-on flat covers.
3. For flush-mounted pull and junction boxes, provide covers with 25 mm (1”) minimum extension all around.

2.3 General Cabinets:

1. Type D or E to be sheet steel, for surface mounting, complete with screw on cover (D) or hinged door (E), and return flange overlapping sides, handle and catch.

PART III - EXECUTION

3.1 Splitter Installation:

1. Install splitter troughs where required. Mount plumb, true and square to the building lines.
2. Extend splitters for full length of equipment arrangement except where indicated otherwise.
3. Provide **watertight connections** for all services entering the top of the splitter trough.

3.2 Junction, Pull Boxes and Cabinet installation:

1. Install junction, pull boxes and cabinets in inconspicuous but accessible locations.
2. Only certain junction and pull boxes are indicated. Provide pull boxes so as not to exceed 30 m (100’) of conduit run between boxes, and after every two (2) 90 degree bends.

3.3 Identification:

1. Install nameplates.

End of Section

SECTION 26 05 32: OUTLET AND CONDUIT BOXES AND FITTINGS.

PART I - GENERAL

1.1 Work Included:

1. Provide outlet and conduit boxes and fittings as required for a complete electrical system installation.

PART II - PRODUCTS

2.1 Outlet and Conduit boxes - General

1. The construction of outlet boxes, conduit boxes and fittings is to be based on:
   - Sheet Metal Outlet and Device Boxes: Comply with NEMA OS 1 and UL 514A.
   - Cast-Metal Outlet and Device Boxes: Comply with NEMA FB 1, [ferrous alloy] [aluminum], Type FD, with gasketed cover.
   - Nonmetallic Outlet and Device Boxes: Comply with NEMA OS 2 and UL 514C
2. Boxes shall be suitable for the utilization voltage.
3. Combination boxes shall have barriers where outlets for more than one system are grouped.
4. Recessed 100 mm (4”) square or larger outlet boxes shall be complete with single or ganged plaster rings to suit application.

2.2 Sheet Steel Outlet boxes:

1. Electro-galvanized steel single and multi-gang device boxes for flush installation, shall be minimum size 75 mm x 50 mm x 37 mm (3” x 2” x 1-1/2”) unless otherwise specified or required. 100 mm (4”) square outlet boxes shall be used when more than one conduit enters one side, with extension and plaster rings as required.
2. Boxes for door switches and push buttons shall be sized as required.
3. Utility boxes for connection to surface mounted EMT conduit, shall be minimum 100 x 54 x 48 mm (4" x 2-1/8” x 1-7/8”) size.
4. Square or octagonal outlet boxes for lighting fixture outlets, shall be minimum 100 mm (4”) size.
5. Square outlet boxes with extension and plaster rings for flush mounting devices in finished plaster or tile walls, shall be minimum 100 mm (4”) size.

2.3 Masonry Boxes:

1. Electro-galvanized steel masonry single and multi-gang MBD boxes shall be used for flush mounted devices in exposed block walls.

2.4 Concrete boxes:

1. Electro-galvanized sheet steel concrete boxes shall be used for flush mounting in concrete, with matching extension and plaster rings as required.

2.5 Conduit Boxes:

1. Cast FS or FD feraloy boxes with factory-threaded hubs and mounting feet shall be used for outlets connected to surface mounted rigid conduit.

2.6 PVC Boxes:

1. F series and octagon boxes shall be moulded type, with fastening ears and screwed secured covers as required.

2.7 Fittings - General:

1. Bushing and connectors shall be with nylon insulated throats.
2. Provide knock-out fillers to prevent entry of foreign materials.
3. Use conduit outlet bodies for conduit up to and including 32 mm (1-1/4”) and pull boxes for larger conduits.
4. Provide double locknuts and insulated bushings on sheet metal boxes.

PART III - EXECUTION

3.1 Installation:

1. Support boxes independently of connecting conduits.
2. Fill boxes with paper, foam sponges or similar approved material to prevent entry of construction material.
3. Size box wiring chambers in accordance with Electrical Safety Code.
4. Gang boxes together where wiring devices are grouped.
5. Provide matching blank cover plates for boxes without wiring devices.
6. Use combination boxes where outlets for more than one system or voltage are grouped.
7. For flush installations, mount outlets flush with finished wall using plaster rings to permit wall finish to come within 5mm (1/4”) of opening.
8. Provide correct size of openings in boxes for conduit and armored cable connections. Reducing washers are not allowed.

End of Section

SECTION 26 05 34: CONDUITS, CONDUIT FASTENINGS AND CONDUIT FITTINGS.

PART I - GENERAL

1.1 Work Included:

1. Provide conduits, conduit fastenings and conduit fittings as detailed below and as required for a complete electrical installation.

PART II - PRODUCTS

2.1 CONDUITS

1. Rigid and epoxy coated conduit shall be threaded, galvanized steel and shall be manufactured to CSA C22.2 No. 45.
2. Electrical metallic tube (EMT) conduit and couplings shall be manufactured to CSA C22.2 No. 83.
3. Flexible metal conduit and liquid tight - flexible metal conduit shall be manufactured to CSA C22.2 No. 56.

2.2 CONDUIT FASTENINGS

1. Conduit straps shall be steel, double hole for rigid or EMT conduit. **Single hole straps are not acceptable.**

2.3 CONDUIT FITTINGS

1. Fittings for conduits shall be manufactured to CSA C22.2 No.18. Provide coatings as per conduit.
2. Fittings for rigid conduit shall be steel threaded type.
3. Fittings for EMT conduit to be steel set screw type fittings.
4. Fittings for flexible conduit and exposed conduit outdoors to be liquid-tight type, straight or angled threaded for rigid and compression for EMT conduit.
5. Expansion fittings for rigid or EMT conduits shall be of the watertight type, with an integral bonding assembly, suitable for deflection in all directions.

2.4 PULLING CABLES

1. Pulling cables shall be 1/4” diameter polypropylene and of a strength suitable for tension to be pulled.

2.5 WATERPROOF MEMBRANE

1. Conduits penetrating waterproof membranes shall be PEM #6372.

PART III - EXECUTION

3.1 INSTALLATION (GENERAL)

1. The conduits for the following circuits and systems shall be run separately:

   - 120/208 volt utility power distribution.
   - 347/600 volt utility power distribution.
   - 120/208 volt emergency power distribution.
   - 347/600 volt emergency power distribution.
   - Normal power to luminaries.
   - Emergency power to luminaries and exit signs.
   - Fire alarm system multiplex loop devices.
   - Fire alarm system signaling devices.
   - Access Control and CCTV System devices.
   - Telephone and data systems.
   - Control wiring.
   - Net Status devices.

2. All conduits to be surface mounted (exposed, EMT) in mechanical and electrical service spaces and rooms and concealed elsewhere unless otherwise shown.
3. Wiring in ceiling spaces and in all partitions shall be EMT.
4. Exposed conduits shall be installed to conserve headroom and cause minimum interference in spaces through which they pass.
5. Use rigid conduit up to 2.4 m (8’ -0”) above finished floor where exposed indoors
6. **Use RGS conduit PVC coated galvanized rigid steel Robroy Permacote in all outdoor locations and in areas that are not environmentally controlled.**
7. Use electrical metallic tubing (EMT) above grade, and above 2.4 m (8’-0”) above finished floor where exposed indoors.
8. Use flexible liquid tight metal conduit for connection to motors, and transformers.
9. Bend conduit without heating. Replace conduit if kinked or flattened more than $1/10^{th}$ of its original diameter.
10. Mechanically bend conduit over 20mm (3/4”) diameter.
11. Field threads on rigid conduit must be of sufficient length to draw conduits tight.
12. Install pulling cables in all conduits that are to remain “empty”.
13. A maximum of two (2), 90 degree bends, or equivalent up to 180 degrees, will be permitted without installation of a pull box. Radius of bends must be no less than ten (10) times the conduit diameter.
14. Conduits must be dry, before installing wires.
15. Support all branch conduits from building structure. Do not clip conduits to ceiling hangers, sprinkler pipes, plumbing or BAS wiring hangers.

3.2 SURFACE CONDUITS

1. Surface conduits shall be run parallel or perpendicular to building lines.
2. Conduits located near any heat producing equipment shall have 1500 mm (5 ft.) clearance.
3. Conduits adjacent to structural steel, beams or columns shall be run within the flanged portion, unless otherwise shown.
4. Group exposed conduits on surface or suspended channels.
5. Do not pass conduits through structural members except where indicated and approved by landlord.
6. Do not locate conduits less than 75 mm (3”) parallel to steam or hot water lines. Provide a minimum clearance of 25 mm (1”) at crossovers.

3.3 CONDUIT SIZE

1. The minimum conduit size shall be 19 mm (3/4”).

2. All undimensioned conduits in the drawings are 19 mm (3/4”).

3.4 EXPANSION FITTINGS

1. Conduit expansion fittings shall be provided on all conduits crossing expansion joints, and at maximum of 60 m (200’) spacing.
2. Install expansion fittings perpendicular to expansion joint.
3. Refer to structural drawings for location of expansion joints.

End of Section

SECTION 26 27 26: WIRING DEVICES.

PART I - GENERAL

1. Provide all wiring devices indicated on drawings and described below.

PART II - PRODUCTS

2.1 Standards:

1. Construction of manually operated general purpose AC switches is to be based on CSA C22.2 No. 111, snap switches on CSA C22.2 No.55, and receptacles, plugs and similar wiring devices on CSA C22.2 No. 42.
2. Devices shall be Specification Grade and of one manufacturer throughout

2.2 Switches:

1. Switches shall be suitable for the voltage and load controlled and shall be single pole or three way as indicated.
2. They shall have terminal holes approved for No. 10 AWG wire, silver alloy contacts, and urea or melamine moldings for parts subject to carbon tracking.
3. They shall be suitable for back and side wiring, and rated for tungsten filament and fluorescent lamps, and up to 80% of rated capacity of motor loads.
4. White decorator style switches shall be used for 120V circuits, in all finished areas.
5. White decorator style switches shall be used for 347V circuits in all areas.

2.3 Receptacles:

1. Duplex receptacles shall be NEMA Type 5-15R, 125 volt, 15 Amp, U ground and NEMA Type 5-20R (T Slot), 125 volt, 15/20 Amp, U Ground.
2. They shall be decorator style.
3. They shall be suitable for No. 10 AWG, back and side wiring, have break-off links for use as split receptacles and shall have eight (8) back wired entrances, four (4) side wiring screws and double wipe contacts with riveted grounding contacts.

2.4 Coverplates:

1. Coverplates shall be white in finished areas and stainless steel in unfinished areas.
2. Use die cast aluminum coverplates for wiring devices mounted for surface mounted FS or FD boxes, and pressed steel coverplates for utility surface boxes.
3. Use weatherproof spring-loaded, cast aluminum coverplates complete with gaskets for exterior mounted single receptacles and switches, or where indicated.

PART III - EXECUTION

3.1 Installation:

1. Switches:
   1. Install single throw switches with lever in “UP” position when switch closed.
   2. Install switches in gang type outlet box when more than one switch is required in one location.

2. Receptacles:
   1. Install receptacles in gang type outlet box when more than one device is required in one location.

3. Coverplates:
   1. Protect coverplate finish until painting and other work is finished or install after painting is complete.
   2. Do not use flush type coverplates on surface mounted boxes.

End of Section

SECTION 26 28 13.01: FUSES

PART I - GENERAL

1.1 Work Included:

1. Supply and install fuses in disconnect switches, etc. as required to complete this contract.

PART II - PRODUCTS

2.1 Fuses - General:

1. Plug and cartridge fuses shall be manufactured to CSA C22.2 No. 59.
2. HRC fuses shall be manufactured to CSA C22.2 No. 106 and to have interrupting capability of 200,000A symmetrical.
3. Fuses shall be the product of one manufacturer.
4. Fuse type reference L1, L2, J1, R1, etc. have been adopted for use in this specification.

2.2 Fuse Types:

1. HRCI - J fuses.
    1. Type J1, time delay, capable of carrying 500% of its rated current for 10 seconds minimum.
    2. Type J2, fast acting.
2. HRC - L.
    1. Type L1, time delay, capable of carrying 500% of its rated current for 10 seconds minimum.
    2. Type L2, fast acting.
3. HRC - R fuses (For UL Class RK1 fuses, peak let-through current and I^2t values not to exceed limits of UL 198E table 10.2.)
    1. Type R1, (UL Class RK1), time delay capable of carrying 500% of its rate current for 10 seconds minimum, to meet UL Class RK1 maximum let-through limits.
    2. Type R2, time delay, capable of carrying 500% of its rated current for 10 seconds minimum.
    3. Type R3, (UL Class RK1), fast acting Class R, to meet UL Class RK1 maximum let-through limits.
    4. HRCII - C fuses.

PART III - EXECUTION

3.1 Installation:

1. Install fuses in mounting devices immediately before energizing circuit.
2. Ensure circuit fuses fitted to physically matched mounting devices. Install Class R rejection clips for HRCI-R fuses.
3. Ensure correct fuses fitted to assigned electrical circuit.
4. Fuses protecting motor loads and transformers to be type J1 for up to and including 600A and L1 for ratings above 600A.
5. Fuses protecting feeder circuits to be type J2 for up to and including 600A and type L2 ratings above 600A.
6. Fuses protecting other services or equipment shall be of the type required for that purpose.

End of Section

SECTION 26 28 23: DISCONNECT SWITCHES - FUSED AND NON-FUSED

PART I - GENERAL

1.1 Work Included:

1. Provide all disconnect switches shown on the drawings and as required for motors.

PART II - PRODUCTS

2.1 Equipment

1. Fuseholder assemblies to CSA C22.2 No. 39
2. Fusible and non-fusible disconnect switches shall be installed in CSA enclosures.
3. Provide for padlocking in “OFF” switch position by one lock.
4. Provide a mechanically interlocked door to prevent opening when handle in “ON” position.
5. Provide fuses sized as required.
6. Fuseholders in each switch shall be suitable without adapters, for type of fuse as specified.
7. Provide quick make, quick break action.
8. Provide ON-OFF switch position indication on switch enclosure cover.
9. Enclosures shall be CSA/NEMA Type 1 modified to sprinkler proof enclosure.

PART III - EXECUTION

3.1 Installation:

1. Install disconnect switches with or without fuses as required.
2. Provide **watertight connections** for all services entering the top of the disconnect switches.

End of Section

SECTION 26 51 00: INTERIOR LIGHTING.

PART I - GENERAL

1.1 Work Included:

1. Provide lighting fixtures as shown on the drawings and described below.

PART II - PRODUCTS

2.1 Lamp Standards:

1. Incandescent lamps shall be manufactured to CSA C22.2 No. 84.
2. Fluorescent lamps shall be manufactured to ANSI C78.
3. Incandescent, fluorescent and HID lamps shall be of 1 (one) manufacturer, either in total, or in groups defined by lamp type.
4. Ballast and lamps provided under this contract must be an approved combination by both respective manufacturers.

PART III - EXECUTION

3.1 INSTALLATION

1. Lighting fixtures: Set level, plumb, and square with ceilings and walls. Install lamps in each fixture.
2. Lamp and Driver / Ballast Installation:
    1. Refer to luminaire schedule and drawings, for lamp and driver / ballast requirements.
    2. Install lamps only when the luminaires are clean.
    3. Ensure that lamps are suitable for luminaires before energization and lamp length and colours are that as specified. Report any discrepancies to the consultant.
3. Luminaire Installation:
    1. Install luminaires accurately and carefully aligned complete with all mounting hardware. Ensure any suspension rods are vertical.
    2. All luminaires shall be supplied with accessory items such as yokes, plaster rings, frame adjusters, etc., where required for proper installation.
    3. At the time of date of “Substantial Completion” all luminaires, lenses, louvers and lamps must be clean and the lamps illuminated.
4. Luminaire Support:
    1. All fixtures in finished ceilings must be chained by 2 points directly to main structure such that they are supported independently of the ceiling system.
    2. All fixtures in exposed ceiling areas (no T-bar or Drywall) shall be mounted on 1-5/8” unistrut, running the full length of the run of fixtures. The unistrut is to be suspended from the ceiling deck by 3/8” threaded rod from unistrut between the joists. Do not puncture ceiling deck.
    3. All lighting feeds for suspended fixtures shall be dropped from the deck or slab straight down into the fixture or raceway. Fixture to fixture conduits will not be permitted. Conduit must go to the deck then to the next fixture.

5. Cleaning:

    1. All luminaires must be cleaned before lamping and installing lenses or louvres.
    2. Use dry, clean, soft cloths if luminaires are dusty. Use mild solvents to clean soiled luminaires.

3.2 FIELD QUALITY CONTROL

1. Test for Emergency Lighting: Interrupt power supply to demonstrate proper operation. Verify transfer from normal power to battery and retransfer to normal.
2. Prepare a written report of tests, inspections, observations, and verifications indicating and interpreting results. If adjustments are made to lighting system, retest to demonstrate compliance with standards.

End of Section

SECTION 26 60 01: ELECTRICAL IDENTIFICATION.

PART I - GENERAL

1.1 Work Included:

1. Identify electrical equipment as specified herein.

1.2 Manufacturer's Nameplates:

1. Have the manufacturer's nameplates affixed to each item of all equipment showing the size, name of equipment, serial number and all information usually provided, including voltage, cycle, phase, horsepower, etc., and the name of the manufacturer and his address. Ensure that all stamped, etched or engraved lettering on plates is perfectly legible. Ensure that nameplates are not painted over. Where apparatus is to be concealed, attach the nameplate in an approved location on the equipment support or frame.
2. Ensure that panels and other apparatus which have exposed faces in finished areas do not have any visible trademarks or other identifying symbols. Mount nameplates behind doors.

PART II - PRODUCTS

2.1 Lamacoid Plates:

1. Green background with black engraved letters 10 mm (0.4") high or 25 mm (1") high as noted for normal power distribution.
2. Red background with black engraved letters 10 mm (0.4") high or 25 mm (1") high as noted for EPS power distribution.

2.2 Conductor Markers:

1. Cable diameter less than 13 mm (1/2") - Electrovert type Z.
2. Cable diameter 13 mm (1/2") and larger - Electrovert #510 strap-on.
3. Colour - white with black markings except fire alarm and life safety system which shall be white with red markings.

PART III - EXECUTION

3.1 Conduit Services - Power:

1. Locate identification:
   - Behind each access door.
   - At each change of direction and at junction boxes.
   - At not more than 10 m (40') apart in straight runs of conduit behind removable enclosures such as lay-in type ceiling, but on both sides of sleeves through walls or floors.
   - Above each floor or platform for vertical exposed conduits, preferably 1500 m (60") above floor or platform.
   - Use stencils and stencil paint or lamacoid plates on all conduits.
   - Use minimum 25 mm (1") high letters.
   - The identification shall describe system voltage and service, i.e., "120 / 208 volt lighting to panel AA".

3.2 Conduits and outlet boxes:

1. Identify conduits and outlet boxes for the various systems by the use of the following distinctive colour paints. Apply a small area of paint to the inside of each outlet box, pull box and panel as it is being installed. Identify junction boxes in suspended ceiling areas with colour on both inside and outside.
    1. 120 / 208 volt system. -Black
    2. Fire Alarm systems. -Red
    3. 347/600 volt system. -Blue
    4. Security Alarm system -Orange
2. Use the colour coding as defined in NEC Section 210.
3. Where the existing colour coding differs from these Specifications, notify the Consultant of colours used and maintain existing colour coding.

3.3 Equipment Nameplates:

1. Identify all equipment listed below with lamacoid plates, letters 10 mm (0.4") high, unless otherwise noted.
    1. Lighting and Power Panels - Plates to be on outsides of door. Typical identification: "Lighting Panel C 120/208V, 3PH, 4 W MAINS 225 AMP 18KA RMS. Supplied from Panel BB".
    2. Disconnect switches and starters - Plates to be mounted externally on switch cover. Typical identification: "Fan S4, 208V, 3PH".
    3. Transformers - Plates to be mounted externally on case. Typical identification: "Transformer TR-UPSA 225 KVA/416/120/208V, 3PH / 4W fed from Panel UPS A".
2. Secure with mechanical fastening devices except on the inside of panel doors where gluing will be acceptable.

3.4 Wiring Colour Code:

1. Power and Lighting Conductors:
    1. Phase A - Red
    2. Phase B - Black
    3. Phase C - Blue
    4. Neutral - White
    5. Ground - Green
2. For sizes available in black only, use coloured tape markers at junction boxes and terminal points to match phase coding described above.
3. Band green isolated ground conductors with yellow tape.
4. Control conductors - Orange
5. Fire Alarm System Conductors.
    1. Alarm initiating devices and manual pull stations - red and blue.
    2. Alarm signaling devices - black and white.

3.5 Conductor Markers:

1. For power feeders, install markers at either end of the conductors where terminated inside of equipment to match wiring diagram conductor identification or panelboard circuit numbers. Typical identification Panel AA circuits - 21; use "AA-21". For a three phase circuit provide identification on phase A conductor only. For a single phase circuit provide identification on the phase conductor.
2. For Branch circuits supplying single phase and three phase devices such as receptacles and connections to equipment identify conductors at panel and in device outlet box. Install marker on phase conductor inside outlet box. Typical identification if device is connected to Panel B - circuit 14, marker identification "B-14".

End of Section

SECTION 26 60 02: TESTING AND COMMISSIONING OF ELECTRICAL SYSTEMS.

PART I - GENERAL

1.1 Description:

1. Include in work of this section, the testing and commissioning of all new electrical and component systems.
2. Include any specific testing of equipment required by the Hydro Inspection or Supply Authorities.
3. The complete costs of the site, load bank and factory testing and commissioning witnessing of Electrical Equipment is to be included in the Bid price.
4. Inform manufacturers of all factory and site testing requirements and include all their costs in the Bid price.
5. At their own discretion, testing is to be witnessed by the Owner and the Electrical Consultant.

1.2 Scope:

1. Include factory testing and approved certification, where required.
2. Coordinate with the equipment manufacturer, notify the Electrical Consultant in writing, 10 (ten) days before any factory testing to confirm Consultant's desired presence, and be present for all site testing.

1.3 Completion of Work:

1. All electrical systems and equipment shall be totally commissioned and operating before date of "Substantial Completion".
2. Coordinate with other trades and the building operations staff for work which affects the operation of the electrical systems, before submitting request for testing and commissioning. Failing to comply, bear all costs including Consultant's time cost, incurred for re-testing and re-commissioning.

PART II - PRODUCTS

2.1 Materials:

1. Provide all tools, equipment, labour and materials required to perform electrical testing and commissioning as specified. Provide the test results report (s).

PART III - EXECUTION

3.1 General:

1. Perform site testing and commissioning only after all equipment is installed and operational.
2. Furnish manufacturer's certificate or letter confirming that entire installation as it pertains to each system has been installed to manufacturer's instructions.
3. Provide four (4) copies of certificates of all factory and site testing in complete detail bearing in each case, the seal of the engineer responsible for the tests.
4. Submit all test results for Consultant's review.
5. All equipment or system deficiencies identified by factory or site testing procedures, to be corrected by the Contractor prior to obtaining a "Certificate of Substantial Completion".
6. Submit report, at completion of measurements, listing phase and neutral currents on panelboards, dry-type transformers and motor control centres, operating under normal load. Include hour and date on which load was measured, and voltage at time of test.

7. General operations: energize and operate electrical circuit and item. Repair, alter, replace, test and adjust as necessary for a complete and operating electrical system.
8. Test systems and obtain written confirmation from manufacturers that components have been installed correctly and system functioning as intended. Submit certification for power distribution, communications systems and emergency power to Owner's Consultant.
9. Provide labour, instruments, apparatus and pay expenses required for testing. Owner's Consultant reserves right to demand proof of accuracy of instruments used.
10. Perform the following tests on completed power systems:
    1. Supply voltage: measure line voltage of each phase at load terminals of main breakers and report results in writing to Owner's Consultant. Perform test with majority of electrical equipment in use.
    2. Motor loading: measure line current of each phase of motors with motor operating under load, and report results in writing to Owner's Consultants.
        1. Upon indications of imbalances or overloads, thoroughly examine electrical connections and rectify defective parts or wiring.
        2. If electrical connections are correct, report overloads due to defects in driven machines in writing to Owner's Consultant.
    3. Insulation resistance tests:
        1. Megger circuits, feeders and equipment up to 350V with a 500V instrument for at least one (1) minute.
        2. Megger 350-600V circuits, feeders and equipment with a 1000V instrument for at least one (1) minute.
        3. Check resistance to ground before energizing.
        4. Coordinate and carry out motor testing at same time as driven equipment is being tested. In addition to motor loading tests, provide labour and instruments to read and record motor load readings required to supplement tests on driven equipment through various load sequences, as required by driven equipment tests.
11. Immediately prior to occupancy, test entire electrical system by performing loss and return of utility power test. Demonstrate operation of:
    1. Low voltage service equipment and metering
    2. Exit and emergency lighting
    3. Restabilization of systems after power return. Attach report printouts as evidence of expected operation on systems.
    4. User equipment shut-down and auto-restart.

3.2 Field Tests

1. Provide advance notice to Owner's Consultant of proposed testing schedule.
2. Perform tests at time of acceptance of work.
3. Conduct and pay for field tests:
    1. Power distribution, including phase voltage, grounding and load balancing.
    2. Circuits originating from branch distribution panels.
    3. Lighting and lighting control. Motors, heaters and associated control equipment, including sequenced operation.
    4. Emergency Power Systems
4. Perform tests in presence of Owner's Representative.
    1. Provide instruments, meters, equipment and personnel required to conduct required tests.
    2. Test systems to verify operation as specified.
5. Conduct di-electric tests, hi-pot tests, insulation resistance tests and ground continuity tests as required by nature of various systems and equipment

3.3 General Testing:

1. With the system completely connected, perform the following tests:

1. Control and Switching - all circuits shall be tested for the correct operation of devices, switches and controls.
2. Polarity Tests - all sockets shall be tested for correct polarity.
3. Voltage Test - a voltage test shall be made at the last outlet of each circuit. The maximum drop in potential permitted will be 2% on 120 and 208 volt branch circuits and on 208 volt feeder circuits. Any deficiency in this respect shall be corrected.
4. Phase Balance - measure the load on each phase at each splitter, and lighting and power panelboard and report the results in writing to the Consultant. Rearrange phase connections as necessary to balance the load on each phase as instructed by the Consultant, with the re-arrangement being restricted to the exchanging of connections at the distribution points mentioned in this paragraph. After making any such changes, make available to the Consultant drawings or marked prints showing the modified connections.
5. General Operations - energize and put into operation each and every electrical circuit and item. Necessary repairs, alterations, replacements, tests and adjustments required shall be made for complete and satisfactory operating systems.

3.4 Sealing:

1. Ensure and verify that all penetrations of electrical equipment have been properly sealed with appropriate material and to the manufacturer’s requirements.

3.5 Noise and vibration:

1. Ensure and verify that all isolation equipment has been installed where required and to the manufacturers’ recommendations. Include the locations of and measurements of static deflection of spring isolators.

3.6 Emergency Light Level Measurements

1. As part of this scope of work procure the services of a third party professional engineer to measure and record emergency lighting levels in foot candles throughout the scope of work areas with a calibrated light meter. Readings shall be taken based on a minimum of one reading for every 20’ center in open office areas, equipment rooms and corridors / hallways and one reading in each closed office, meeting room, boardroom and stairwell.
2. All light level readings are to be taken during non-daylight hours.
3. Provide a letter identifying light level readings and stating that the emergency lighting levels meet the requirements of the Ontario Building Code (OBC). Notify Owner and Consultant at least ten (10) days prior to proposed testing date and schedule testing at time and date acceptable to Owner and Consultant.

3.7 Test Results

1. Submit test results to Owner’s Consultant for review.
2. Testing methods and test results: to CSA, NEC 2017 and authorities having jurisdiction.
3. Remove and replace conductors found damaged with new materials.
4. Provide required labour and tools, if during testing the Owner’s Representative requests equipment be opened and removed from their housings to examine equipment, terminations and connections.

End of Section

SECTION 28 31 00.01: MULTIPLEX FIRE ALARM SYSTEM – BASE BUILDING

PART I – GENERAL

1.1 Work Included:

1. All work required and /or shown on drawings related to life safety systems (ie: fire alarm, EVAC speakers, etc) shall be included in the tenant electrical contractor's tender price. Employ and pay for the services of the landlord's contractor to provide all conduit, wiring, devices, final connections, modifications and provision of new interfacing devices in existing system control panels (ie: modules, relays, sub-panel, etc). Ensure new devices to be used are compatible with the existing system. Maintain the integrity of the existing supervised circuits when new devices are to be connected. The system shall be tested and certified for proper operation upon completion of the work. Employ and pay for the services of the landlord's verification contractor.
2. Employ and pay for the services of the landlord's contractor to update the base building active graphic software system with all devices provided, deleted and relocated as part of this scope of work and with fire alarm system zone changes as part of this scope of work.
3. Employ and pay for the services of the landlord's contractor to update the base building passive graphics with all devices provided, deleted and relocated as part of this scope of work and with fire alarm system zone changes as part of this scope of work.
4. Employ and pay for the services of the landlord's contractor to provide additional power boosters, amplifiers and all other controls and accessories as required to ensure that the existing fire alarm system can accommodate all signaling devices shown on the drawings.
5. In **addition** to the field devices indicated on the drawings to be provided under this contract, include in the tender price to supply and install the following quantities of additional devices throughout the scope of contract floors, complete with 75'-0" of conduit and wiring, programming, testing and certification, labeling, verification and 100% repeat verification for each device post City Fire Department inspection. Reverify all existing fire alarm devices.

Quantity of Devices	Device Type
1	Fire Alarm System Horn
1	Fire Alarm System Strobe Light

1. Test and verification in conformance with CAN/ULC S1001, Integrated Systems Testing Of Fire Protection And Life Safety Systems. Provide a satisfactory Integrated Testing Report. As part of the base bid price, electrical contractor must procure (engage, coordinate and pay for) an Integrated Testing Coordinator, responsible to develop and implement the Integrated Testing Plan.

End of Section

Project: 23105

Panelboard: LP-1RA
Voltage (V):
Phase/Wire:
Bus and Lugs Rating (A):

CCT NO	Load	Breaker Amp	Breaker Pole		CCT NO	Load	Breaker Amp	Breaker Pole
1	EXISTING CCT	20	1		2	EXISTING CCT	15	1
3	EXISTING CCT	20	1		4	EXISTING CCT	15	1
5	EXISTING CCT	20	1		6	EXISTING CCT	15	1
7	EXISTING CCT	15	1		8	EXISTING CCT	15	1
9	EXISTING CCT	15	1		10	EXISTING CCT	15	1
11	EXISTING CCT	15	1		12	EXISTING CCT	15	1
13	EXISTING CCT	15	1		14	EXISTING CCT	15	1
15	EXISTING CCT	15	1		16	EXISTING CCT	15	1
17	EXISTING CCT	15	1		18	EXISTING CCT	15	1
19	EXISTING CCT	15	1		20	EXISTING CCT	15	1
21	EXISTING CCT	15	1		22	EXISTING CCT	15	1
23	EXISTING CCT	15	1		24	EXISTING CCT	15	1
25	EXISTING CCT	15	1		26	EXISTING CCT	15	1
27	EXISTING CCT	15	1		28	EXISTING CCT	15	1
29	EXISTING CCT	15	1		30	EXISTING CCT	15	1
31	EXISTING CCT	15	1		32	EXISTING CCT	15	1
33	EXISTING CCT	15	1		34	EXISTING CCT	15	1
35	EXISTING CCT	15	1		36	EXISTING CCT	15	1
37	EXISTING CCT	15	1		38	EXISTING CCT	15	1
39	EXISTING CCT	15	1		40	EXISTING CCT	15	1
41	EXISTING CCT	15	1		42	EXISTING CCT	15	1

Project: 23105

Panelboard: LP-1RA
Voltage (V):
Phase/Wire:
Bus and Lugs Rating (A):

CCT NO	Load	Breaker Amp	Breaker Pole		CCT NO	Load	Breaker Amp	Breaker Pole
43	EXISTING CCT	20	1		44	EXISTING CCT	15	1
45	EXISTING CCT	20	1		46			
47	EXISTING CCT	20	1		48			
49	BF WASHROOM HAND DRYER	15	1		50			
51	BF WASHROOM DOOR OP	15	1		52			
53	BF WASHROOM DOOR LOCK	15	1		54			
55					56			
57					58			
59					60			
61					62			
63					64			
65	EMERGENCY LIGHTING	15	1		66			
67					68			
69					70			
71					72			

Project: 23105

Panelboard: PANEL 54036
Voltage (V):
Phase/Wire:
Bus and Lugs Rating (A):

CCT NO	Load	Breaker Amp	Breaker Pole		CCT NO	Load	Breaker Amp	Breaker Pole
1	EXISTING CCT	15	1		2	EXISTING SPARE	15	1
3	EXISTING CCT	15	1		4	EXISTING CCT	15	1
5	EXISTING CCT	15	1		6	EXISTING CCT	15	1
7	EXISTING CCT	15	1		8	EXISTING CCT	15	1
9	EXISTING CCT	15	1		10	EXISTING CCT	15	1
11					12	EXISTING CCT	15	
13	EXISTING CCT	30	1		14			2
15	EXISTING CCT	15	1		16	EXISTING CCT	15	1
17	EXISTING CCT	20	1		18	EXISTING CCT	15	1
19					20	RP-WS	100	
21					22			2
23	FFH-1	20			24	FFH-3	20	
25			2		26			2
27	FFH-2	20			28	FFH-4	20	
29			2		30			2

Project: 23105

Panelboard: PANEL N4
Voltage (V):
Phase/Wire:
Bus and Lugs Rating (A):

CCT NO	Load	Breaker Amp	Breaker Pole		CCT NO	Load	Breaker Amp	Breaker Pole
1	EXISTING CCT	15	1		2	EXISTING CCT	15	1
3	EXISTING CCT	15	1		4	EXISTING CCT	15	1
5	EXISTING CCT	15	1		6	EXISTING CCT	15	1
7	EXISTING CCT	15	1		8	EXISTING CCT	15	1
9	EXISTING CCT	15	1		10	EXISTING CCT	15	1
11	EXISTING CCT	15	1		12	EXISTING CCT	15	1
13	EXISTING CCT	15	1		14	EXISTING CCT	15	1
15	EXISTING CCT	15	1		16	EXISTING CCT	15	1
17	EXISTING SPARE	15	1		18	EXISTING SPARE	15	1
19	EXISTING SPARE	15	1		20	EXISTING SPARE	15	1
21	EXISTING SPARE	15	1		22	EXISTING SPARE	15	1
23	EXISTING SPARE	15	1		24	MUSIC ROOM	20	1
25	STAFF WASHROOM HAND DRYER	15	1		26	MUSIC ROOM	20	1
27	STAFF WASHROOM HAND DRYER	15	1		28	MUSIC ROOM	20	1
29	STAFF WASHROOM RECEPTACLE	20	1		30	MUSIC ROOM	20	1

Project: 23105

Panelboard: RP-WS
Voltage (V):
Phase/Wire:
Bus and Lugs Rating (A):

CCT NO	Load	Breaker Amp	Breaker Pole		CCT NO	Load	Breaker Amp	Breaker Pole
1	WASHROOM HAND DRYERS	15	1		2	WASHROOM HAND DRYERS	15	1
3	WASHROOM HAND DRYERS	15	1		4	WASHROOM HAND DRYERS	15	1
5	WASHROOM HAND DRYERS	15	1		6	WASHROOM HAND DRYERS	15	1
7	WASHROOM HAND DRYERS	15	1		8	WASHROOM HAND DRYERS	15	1
9	WASHROOM HAND DRYERS	15	1		10	TEAM 2 RECEPTACLE	20	1
11	WASHROOM HAND DRYERS	15	1		12	GF BOY CHANGE ROOM HAND DRYER	15	1
13					14	GF BOY CHANGE ROOM RECEPTACLE	20	1
15	GF WASHROOM HAND DRYERS	15	1		16	GF BOY CHANGE ROOM RECEPTACLE	20	1
17	GF WASHROOM HAND DRYERS	15	1		18	GF GIRL CHANGE ROOM RECEPTACLE	20	1
19	GF WASHROOM HAND DRYERS	15	1		20	GF GIRL CHANGE ROOM RECEPTACLE	20	1
21	GF WASHROOM HAND DRYERS	15	1		22	GF GIRL CHANGE ROOM HAND DRYER	15	1
23	GF WASHROOM HAND DRYERS	15	1		24	TEAM 1 RECEPTACLE	20	1
25					26	CONTROL CCT	20	1
27					28	CONTROL CCT	20	1
29	LIGHTING	20	1		30	EMERGENCY LIGHTING	15	1
31	LIGHTING	20	1		32	EMERGENCY LIGHTING	15	1
33	WASHROOM DOOR OP/LOCK	15	1		34	CONTROL CCT	20	1
35	HOUSEKEEPING	20	1		36	CONTROL CCT	20	1
37	SPARE	15	1		38	SPARE	20	1
39	SPARE	15	1		40	SPARE	20	1
41	SPARE	15	1		42	SPARE	20	1