

DURHAM CATHOLIC DISTRICT SCHOOL BOARD (***D***CDSB)

**ST. THERESA CATHOLIC ELEMENTARY SCHOOL - WASHROOM
RENOVATION**

***T26-10 - UNIVERSAL WASHROOM & CLASSROOM RENOVATIONS
ST. THERESA CATHOLIC SCHOOL***

salter pilon architecture inc.

Project Manual

Divisions 0-33

Project Number: 25030C

Date of Issue: May 5⁸**th**, 2026

Issued for Tender

<p>CONSULTANT'S SEAL</p> <p>This seal governs all Documents and Sections of these Specifications, except Section 00 30 00 – Existing Conditions.</p>	
<p>STRUCTURAL SUBCONSULTANT'S SEAL</p> <p>This seal governs: To Follow</p>	
<p>MECHANICAL SUBCONSULTANT'S SEAL</p> <p>This seal governs: Division 20 – Common Requirements for Mechanical (all Sections) Division 21 – Fire Suppression (all Sections) Division 22 – Plumbing (all Sections) Division 23 – HVAC (all Sections) Division 25 – Integrated Automation (all Sections)</p>	
<p>ELECTRICAL SUBCONSULTANT'S SEAL</p> <p>This seal governs: Division 26 – Common Requirements for Electrical (all Sections) Division 27 – Communications (all Sections) Division 28 – Electronic Safety and Security (all Sections)</p>	

ARCHITECTURAL

A000	TITLE SHEET
A101	SITE PLAN
A201	OVERALL PLAN & GENERAL NOTES
A202	ENLARGED PLAN - EXISTING/DEMOLITION/ALTERATION
A203	ENLARGED PLAN
A301	ELEVATION
A401	SECTIONS
A501	STAIRS
A601	MILLWORK/FINISHES
A701	REFLECTED CEILING PLAN

ELECTRICAL

E000 TO FOLLOW.

MECHANICAL

M000 TO FOLLOW.

LANDSCAPE

L1 TO FOLLOW.

STRUCTURAL

S0.0 TO FOLLOW.

END OF SECTION

1 GENERAL

- .1 Information on existing conditions made available to bidders under this section, is included in the Bid Documents for information purposes only, and does not form part of the Contract Documents.
- .2 The Owner and Consultant assume no responsibility for the scope and accuracy of the information contained in the documents listed herein.
- .3 The Contractor shall be responsible for conducting an on-site evaluation of conditions which can be observed and for correlation of these conditions with the information included under this section.
- .4 Information contained in documents listed here may be used by the Contractor to assist in an assessment of existing conditions. Evaluation of the information shall remain the responsibility of the Contractor.

2 GEOTECHNICAL REPORT

- .1 Geotechnical Investigation of the site for guidance in design and construction was carried out for the Owner and has been appended.

END OF SECTION

1 SUMMARY OF WORK

- .1 The project consists of:
 - .1 New universal washroom for St. Theresa Catholic Elementary School. Site located at 173 Crawford Street, Whitby, Ontario.
- .2 Work by Owner comprises the following:
 - .1 Installation of Owner equipment and furnishings.
- .3 The words 'by others' when used in the Specifications or on the Drawings shall not mean by someone other than the Trade Contractor. The only means by which something shown or specified shall be indicated as not being in the Contract is by the use of the initials 'NIC' or the words 'Not In (the) Contract' or 'By Owner'.

2 WORK RESTRICTIONS

- .1 Contractor's Use of Site
 - .1 Use of site to the areas designated on the drawings for execution of the Work. Do not unreasonably encumber site with materials or equipment. Move stored products or equipment which interfere with operations of Owner, or other contractors. Obtain and pay for use of off-site additional storage, or work areas as required by the Work.
- .2 Hours of Work
 - .1 Hours of work for this Contract are generally confined to regular daily business hours of 8:00am to 5:00pm, Monday to Friday. Where required by sequencing of the Work, portions of the Work may be required to be performed outside of regular daily business hours, or on weekends, but shall be performed at such times at no additional cost to the Owner.
 - .2 Once the building is occupied, Contractor access to the building to perform Work to Correct deficiencies or to perform warranty is restricted and work must be done after hours. Any work during school hours will be required to be coordinated with Owner.

3 OFF SITE WORK

- .1 All work beyond property lines, adjacent to the site, is included in Contract unless noted otherwise.

END OF SECTION

1 GENERAL

- .1 Include all allowances listed below in the Bid Price.
- .2 Expend Cash Allowances as directed by the Consultant.
- .3 Each Cash Allowance will be adjusted to actual cost as defined hereunder and Contract Price will be amended accordingly by written order.
- .4 Progress payments for work and material authorized under Cash Allowances will be made in accordance with GC 5.3 of the Contract.
- .5 Where costs under a cash allowance exceed amount of allowance, Contractor will be compensated for excess incurred and substantiated plus allowance for overhead and profit as set out in Contract Documents.
- .6 Include progress payments on accounts of Work authorized under cash allowances in Consultant's monthly certificate for payment.
- .7 Prepare schedule jointly with Consultant and Contractor to show when items called for under cash allowances must be authorized by Consultant for ordering purposes so that progress of Work will not be delayed.
- .8 Cash allowances do not include H.S.T.

2 MATERIAL ALLOWANCES (SUPPLY ONLY)

- .1 Material cash allowance shall include and provide payment for:
 - .1 Net cost of material.
 - .2 Applicable duties and taxes.
 - .3 Delivery to the Place of the Work.
- .2 Include in the Bid Price, in addition to the material cash allowance, costs for the following:
 - .1 Handling at the Place of the Work, including unloading, uncrating, storage and hoisting.
 - .2 Protection from damage by elements or otherwise.
 - .3 Labour for installation and finishing.
 - .4 Other expenses required to complete installation.
 - .5 Overhead and profit.

3 ASSEMBLY ALLOWANCES (SUPPLY AND INSTALL)

- .1 Assembly cash allowance shall include and provide payment for:
 - .1 Net cost of material.
 - .2 Applicable duties and taxes.
 - .3 Delivery to the Place of the Work.
 - .4 Assembly contractors'/suppliers' only, expenses relating to the following:
 - .1 Handling at site, including unloading, uncrating, storage and hoisting.
 - .2 Protection from damage by elements or otherwise.
 - .3 Labour installation and finishing.
 - .4 Other expenses required to complete installation.
 - .5 Overhead and profit.

- .2 Include in the Bid Price any overhead and profit or related General Contractor costs.

- 4 TESTING & LABORATORY SERVICES
 - .1 Testing & Laboratory Services allowances shall include and provide payment for:
 - .1 Transportation costs to and from the Place of the Work,
 - .2 Personnel & equipment required to perform tests or inspections,
 - .3 Costs of shipping & handling samples to laboratory for testing,
 - .4 Applicable duties and taxes.

- 5 ALLOWANCE AMOUNTS
 - 1. ~~The Total Cash Allowance to be included in the Stipulated Price is in dollars in Canadian funds.~~
 - .1 The Total Cash Allowance to be included in the Stipulated Price is Twenty-Five Thousand Dollars (\$25,000.00) in Canadian funds.**
 - .2 The Cash Allowance shall cover the following (in general):
 - .1 Abatement.**
 - .2 Testing.**
 - .3 Inspection.**
 - .4 PA Commissioning.**
 - .5 CAT 6 cable to the existing IT rack and commissioning the system.**

END OF SECTION

1 MODIFICATIONS TO CONTRACT

- .1 Proposed Change: as issued by the Consultant, will notify the Contractor of an impending or proposed change to the Work, and will require submission of a quotation from the Contractor and all affected Subcontractors for each item noted. Submit quotation within the time period stipulated on the form, and indicate separate line items for labour and materials in each case. Work outlined in a Proposed Change must not proceed without the issuance of a Change Order signed by the Owner.

END OF SECTION

1 APPLICATIONS FOR PAYMENT

- .1 Applications for payment on account may be made monthly as the Work progresses, and shall be preceded by the submission of a Schedule of Values for review by the Consultant, in accordance with the Contract.
- .2 The second and all subsequent applications for payment shall include a statement based on the Schedule of Values, a statutory declaration (CCDC 9B), and a standard Workers Compensation Certificate of Clearance along with all other required documentation listed in the Supplementary General Conditions.

2 SCHEDULE OF VALUES

- .1 Submit Schedule of Values in spreadsheet form acceptable to the Consultant.
- .2 Identify on each Schedule of Values, the following information:
 - .1 Date of Issue
 - .2 Project name
 - .3 Owner's name
 - .4 Contractor's name
 - .5 Payment period
 - .6 Payment certificate number
- .3 Items of work listed shall include, but not be limited to, separate line items for the following:
 - .1 General Accounts
 - .2 Mobilization
 - .3 Supervision
 - .4 Bonds and Insurance
 - .5 Permits and Licenses
 - .6 Operations and Maintenance Manuals/As-Built Drawings
 - .7 All trades or portions of the Work, generally in chronological order
 - .8 Provision of other Products and/or services
 - .9 Cash Allowance expenditures
 - .10 Changes in the Work
- .4 The total Contract amount for each trade or portion of the Work shall be listed beside each item.
- ~~.5 For the purposes of monthly payments, the following values shall be assigned for Operation and Maintenance Manuals and Contractor created Redline and Final electronic As-Built Drawings:~~
 - ~~.1 Architectural Maintenance Manuals: \$2500.00~~
 - ~~.2 Architectural Redline As-Built Drawings: \$2500.00~~
 - ~~.3 Structural Redline As-Built Drawings: \$2500.00~~
 - ~~.4 Mechanical Maintenance Manuals: \$2500.00~~
 - ~~.5 Mechanical Redline and Electronic As-Built Drawings: \$2500.00~~
 - ~~.6 Electrical Maintenance Manuals: \$2500.00~~
 - ~~.7 Electrical Redline and Electronic As-Built Drawings: \$2500.00~~
 - ~~.8 Civil Redline As-Built Drawings: \$2500.00~~

- .6 The Values of the Work shall be listed as to the aggregate percentage and dollar value completed, under the following major headings:
 - .1 Initial Contract Amounts for each line item,
 - .2 Progress to Date,
 - .3 Percent Complete,
 - .4 Current Holdback Applied,
 - .5 Current Invoice less Holdback
 - .6 Current Invoice,
 - .7 Previous Billings,
 - .8 Contract Balance

- .7 Work shall be subtotaled under original Contract amounts, Cash Allowance expenditures, and Changes to the Work.

- .8 Final totals shall identify:
 - .1 Total amount
 - .2 Holdback deducted
 - .3 Holdback released
 - .4 Amount invoiced to date
 - .5 Net amount
 - .6 HST
 - .7 Amount due this Certificate

END OF SECTION

1 PROJECT MANAGEMENT & COORDINATION

.1 Project Coordination

- .1 The Contractor is responsible for the overall coordination of the Work. Coordinate the work of all subcontractors, and provide such assistance as is necessary, including but not limited to;
 - .1 Providing site dimensions and layout,
 - .2 Providing temporary facilities and controls,
 - .3 Scheduling subcontractors work to prevent conflicts,
 - .4 Scheduling and administering regular subtrade scheduling and coordination meetings throughout progress of the Work.
 - .5 Scheduling and administering regular subtrade safety meetings throughout progress of the Work.
 - .6 Coordinate construction sequences and schedules including all components of the Work, including all Divisions with interdependent responsibilities.
- .2 The Contractor shall facilitate production of interference drawings where necessary for coordination of the Work. Provide such interference drawings to the Consultant for review.

.2 Project Supervision

- .1 The Contractor shall provide and maintain full-time supervision on site until Substantial Performance is achieved and the deficiencies have been completed or otherwise agreed with the Owner. The supervisor shall be responsible for the overall day-to-day coordination on site between subtrades.
- .2 The supervisor shall coordinate the work of all subcontractors, and provide such assistance as is necessary, including but not limited to;
 - .1 Layout,
 - .2 Rough carpentry work for blocking, strapping, nailers, etc.

.3 Project Meetings

- .1 Attend all regular bi-weekly project progress meetings throughout progress of work.
- .2 Consultant shall chair regular bi-weekly project progress meetings and shall record and distribute same to Owner, Contractor and Subconsultants. Contractor shall forward to appropriate subcontractors.

.4 Project Site Administration

- .1 Maintain at job site, one copy each of the following:
 - .1 Contract drawings.
 - .2 Project manual.
 - .3 Addenda and Bid Revisions.
 - .4 Reviewed shop drawings.
 - .5 Change orders and other Contract modifications.
 - .6 Field test and inspection reports.
 - .7 Approved schedules.
 - .8 Manufacturer's installation and application instructions.

2 SCHEDULES

.1 Construction Progress Schedule.

.1 Prepare schedule in horizontal chart form, with weekly horizontal time scale identifying first/last work day of each week. Schedule must utilize "critical path" method.

.2 Indicate separate line for each trade or operation of the Work. Arrange trades in chronological order for commencement of that part of the Work.

.3 Identify projected major milestones in the course of the Work such as completion of foundation work, structure, closing in, major inspections by building officials, Substantial Performance, etc.

.2 Submittal Schedule

.1 Provide schedule for submittal of all Shop Drawings, Product Data and Samples.

.2 Provide complete list of all manufactured products to be used in the course of the Work, including those amended by addenda.

.3 Submission of Schedules

.1 Submit one copy of each schedule to the Consultant for review, prior to first progress billing. Amend schedule as required.

.2 Submit 4 copies of each subsequent issue of schedules to the Consultant.

.3 Update schedule on a regular basis or as requested by the Consultant.

3 ELECTRONIC FILE AGREEMENT

.1 Electronic files for this project will not be released until the Electronic Files Transfer Agreement, appended to this Section, has been completed and returned to the Consultant.

4 ADDITIONAL DOCUMENTS

.1 Consultant may issue additional documents in the form of drawings, specifications, schedules, or written instructions to assist proper execution of the Work. These documents shall take one of the following forms as defined in the Contract;

.1 Supplemental Instruction: no adjustment in Contract Price or Contract Time.

.2 Change Order: amendment to the Contract recommended by the Consultant, and agreed upon by the Owner and the Contractor.

5 SUBMITTAL PROCEDURES

.1 Submit to Consultant, all items specified for review, with reasonable promptness and in orderly sequence so as to not cause delay in the Work. Failure to submit in ample time is not considered sufficient reason for an extension of Contract Time and no claim for extension by reason of such default will be allowed.

- .2 The Contractor shall schedule a minimum of 10 working days in order for the Consultants to review each submission. This shall also apply to subsequent resubmissions.
- .3 Do not proceed with work affected by the submittal until review is complete.
- .4 Review all submittals prior to submission to the 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 the requirements of the Work and the Contract Documents. Submittals not stamped, signed, and dated will be returned without review.
- .5 Verify field measurements and affected adjacent work are coordinated.
- .6 Contractor's responsibility for errors and omissions in submission, or deviations from requirements of Contract Documents, is not relieved by Consultant's review of submittals.
- .7 Keep one reviewed copy of each submission on site.
- .8 Shop Drawings
 - .1 The term "shop drawings" means drawings, diagrams, illustrations, schedules, performance charts, brochures and other data which are to be provided by the Contractor to illustrate details of a portion of the Work.
 - .2 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 the Section under which the adjacent items will be supplied and installed. Indicate cross references to design drawings and specifications.
 - .3 Adjustments made on shop drawings by the Consultant are not intended to change the Contract Price. If adjustments affect the value of Work, state such in writing to the Consultant prior to proceeding with the Work.
 - .4 Make changes in shop drawings as the Consultant may require, consistent with Contract Documents. When resubmitting, notify the Consultant in writing of any revisions other than those requested.
 - .5 Shop drawings shall be submitted electronically wherever possible. Files shall be in PDF format only.
 - .6 Shop drawings submitted by FAX, or as copies of FAX transmissions are not acceptable as shop drawings, and will not be reviewed.

- .7 Reproductions of Consultants' drawings are not acceptable for the purpose of creating Shop Drawings. Any drawings submitted for review which contain drawings or any parts of drawings produced by the Consultant, will be rejected. The Consultant will not take responsibility for any resulting delays in construction as a result of the above.
- .8 Shop drawings not submitted in the scale type of the contract documents (ie. metric for metric drawings) will not be reviewed.
- .9 Product Data Sheets
 - .1 Manufacturer's standard schematics, catalogue sheets, diagrams, schedules, performance charts, illustrations and other descriptive data are acceptable in lieu of shop drawings, where specified.
 - .2 Product Data Sheets are acceptable provided they conform to the following:
 - .1 Information not applicable to project has been deleted.
 - .2 Supplement standard information to provide additional information applicable to project.
 - .3 Show dimensions and clearances required.
 - .4 Show performance characteristics and capacities.
 - .5 Show wiring diagrams, when requested, and controls.
 - .3 Submit product data sheets or brochures for requirements requested in specification Sections and as the Consultant may reasonably request where shop drawings will not be prepared due to standardized manufacture of product.
 - .4 Submit Product Data Sheets.
 - .5 Product data sheets submitted by FAX, or as copies of FAX transmissions will not be accepted.
- .10 Return of Submissions
 - .1 If upon review by the Consultant, no errors or omissions are discovered or if only minor corrections are made, the shop drawing transparency or one copy of the product data will be returned and fabrication and installation of Work may proceed.
 - .2 If shop drawings or data sheets are rejected, noted copy will be returned and resubmission of corrected shop drawings or data sheets through the same procedure indicated above, shall be performed before fabrication and installation of Work may proceed.
- .11 Samples
 - .1 Submit samples for review, in duplicate, in sizes requested in respective specification sections. Label samples as to origin and intended use in the Work.
 - .2 Where colour, pattern or texture is criteria, submit full range of samples.

- .3 Deliver samples prepaid to Consultant's office.
 - .4 Notify the Consultant in writing, at the time of submission of deviations in samples from requirements of Contract Documents.
 - .5 Adjustments made on samples by the Consultant are not intended to change the Contract Price. If adjustments affect the value of Work, state such in writing to the Consultant prior to proceeding with the work.
 - .6 Make changes in samples which the Consultant may require, consistent with Contract Documents.
 - .7 Reviewed samples or mock-ups will become standards of workmanship and material against which installed work will be checked on project.
- .12 Submission Requirements
- .1 Accompany submissions with transmittal letter containing:
 - .1 Date,
 - .2 Project title and number,
 - .3 Contractor's name and address,
 - .4 Drawing/page numbers of each shop drawing or data sheet,
 - .5 Identification (ie. "Structural Steel Shop Dwgs."), and
 - .6 Number of copies submitted.
 - .2 Submissions shall include (where applicable) :
 - .1 Date and revision date,
 - .2 Project title and number,
 - .3 Name of Contractor, Subcontractor(s), Supplier/Manufacturer,
 - .4 Identification of product or material,
 - .5 Relation to adjacent structure or materials,
 - .6 Field dimensions, clearly identified as such,
 - .7 Reference standards (CSA, CGSB, ASTM, etc.), and
 - .8 Contractor's stamp, initialled or signed, certifying review of submission, and verification of field measurements.
- .13 Distribution of Submittals after Review
- .1 Distribute copies of shop drawings and product data which carry Consultant's stamp as follows (where applicable):
 - .1 Job site file (Record documents),
 - .2 General Contractor's office,
 - .3 Subcontractors, and
 - .4 Suppliers or Fabricators.

END OF SECTION

1 GENERAL

- .1 Provide construction photographs in accordance with procedures and submission requirements specified in this section.
- .2 Photographs shall be taken using a digital camera.
- .3 Photographs shall be named and grouped by date using the following file name format: ST.THERESA_CS - YYYY_MM_DD (##).jpeg

2 PROGRESS PHOTOGRAPHS

- .1 Provide 1 digital set of construction photographs, documenting progress of the Work. Submit one digital set with each monthly progress draw.
- .2 Submit progress photographs with each monthly progress draw, and at the following milestones;
 - .1 Completion of excavation and pouring of footings,
 - .2 Completion of foundations prior to backfilling,
 - .3 Completion of structural frame,
 - .4 Completion of rough-in of mechanical and electrical services before concealment.
 - .5 Completion of each major portion of work
 - .6 Completion of each major finish item.
- .3 Orientation of Photographs: provide photos from 4 general viewpoints, as well as specific views as required by milestones specified above, and as determined by Consultant prior to first Progress Draw.

3 FINAL PHOTOGRAPHS

- .1 Submit full digital set of construction photographs taken during course of Work with Operations & Maintenance Manuals at the completion of the project.
- .2 Orientation of Photographs: provide final photos as follows:
 - .1 General viewpoints as defined above,
 - .2 Views of all exterior elevations,
 - .3 One view from each street,
 - .4 Views of site showing parking areas and play surfaces,
 - .5 Interior views of all major spaces,
 - .6 One set of views of a typical room,
 - .7 Specific views as determined by Consultant (Max. 48 views).

END OF SECTION

1 GENERAL

1.1 SECTION INCLUDES

- .1 Requirements for quality of work.
- .2 Requirements for for material inspection and testing.
- .3 Requirements for determination of defective materials and work.

1.2 REFERENCE STANDARDS

- .1 CSA A23.1; Concrete Materials and Methods of Concrete Construction.
- .2 CSA A23.2; Methods of Test for Concrete.
- .3 CSA S16.1; Limit States Design of Steel Structures.
- .4 CSA W47.1; Certification of Companies for Fusion Welding of Steel Structures.
- .5 CSA W59; Welded Steel Construction (Metal Arc Welding).
- .6 CISC; Code of Standard Practice for Structural Steel.
- .7 OPSS; Ontario Provincial Standard Specifications.

1.3 REGULATORY REQUIREMENTS

- .1 Products and services provided to complete the Work shall meet or exceed requirements of specified standards, municipal by-laws, building codes and referenced documents.

1.4 INDEPENDENT INSPECTION AND TESTING

- .1 Independent Inspection and Testing Consultants will be engaged by the Owner for the purpose of inspecting and/or testing individual portions of the Work. The initial cost of such services will be borne by the Owner.

1.5 RESPONSIBILITIES

- .1 Inspection and Testing Consultants
 - .1 Inspection and Testing Consultants shall;
 - .1 Provide inspection and testing specified,
 - .2 Inform the Contractor and Consultant immediately upon observance of materials, systems, or procedures not in compliance with the specifications, and
 - .3 Submit complete reports to the Contractor and the Consultant in a timely manner.
- .2 Contractor
 - .1 Contractor shall:
 - .1 Provide access to the Work for Inspection/Testing Consultants, and
 - .2 Inform the Inspection/Testing Consultants in advance of day and time required for inspection and tests.
 - .2 It is the responsibility of the General Contractor to ensure the quality control requirements of the Contract are implemented.
- .3 Consultant
 - .1 The Consultant will make final decisions on changes to the scope of work of inspection and testing that may affect the Contract Price.

- .2 When informed of of any material procedure or test result that does not meet or exceed the specifications, the Consultant will respond in an expedient manner to resolve the issue.

1.6 ACCESS TO WORK

- .1 Allow inspection & testing companies access to the Work, as well as off site manufacturing and fabrication plants.

1.7 REPORTS

- .1 Submit three copies of inspection and test reports to the Consultant.
- .2 Provide copies to Subcontractor of work being inspected or tested, manufacturer or fabricator of material being inspected or tested.
- .3 Submit one copy of inspection and test reports to the Building Official having jurisdiction, where required by that official.
- .4 The cost of tests beyond those called for in the Contract Documents or beyond those required by the law of the Place of Work shall be appraised by the Consultant and may be authorized as recoverable.

1.8 CAST-IN-PLACE CONCRETE

- .1 All cast-in-place concrete shall be subject to inspection and testing as specified herein. Inspection and Testing shall include:
 - .1 Verification of materials delivered to site.
 - .2 Slump tests.
 - .3 Sampling of cylinders, and compressive strength tests.

1.9 MASONRY MORTAR

- .1 All masonry mortar shall be subject to inspection and testing as specified herein. Inspection and Testing shall include:
 - .1 Visual inspection of all materials.
 - .2 Sampling and testing of mortar cubes.

1.10 STRUCTURAL STEEL

- .1 All structural steel shall be subject to inspection and testing as specified herein. Inspection and Testing shall include:
 - .1 Confirmation that materials supplied meet specifications.
 - .2 Shop inspection during fabrication of steel.
 - .3 Checking welders' CWB Certification.
 - .4 Checking fabricated members against design member shapes.
 - .5 Checking fabricated members against allowable sweep and camber.
 - .6 Checking fabricated members against specified camber.
 - .7 Visual inspection of all welded connections including spot checking of joint preparation and fit-up.
 - .8 Non-destructive testing of welding.
 - .9 Sample checking that tolerances are not exceeded during erection including fit-up of field welded joints.
 - .10 Inspection of field cutting.
 - .11 Inspection and testing of all field bolted connections.

- .12 Visual inspection of all welds securing steel deck to structural steel.
- .13 Visual inspection of all bearing plate locations.

2 PRODUCTS

(RESERVED)

3 EXECUTION

3.1 INSPECTION AND TESTING - GENERAL

- .1 Furnish test results and mix designs as may be requested.
- .2 The cost of tests and mix designs beyond those called for in the Contract Documents or beyond those required by the law of the Place of Work shall be appraised by the Consultant and may be authorized as recoverable.

3.2 INSPECTION AND TESTING - PROCEDURES

- .1 Notify the appropriate agency and Consultant in advance of the requirement for tests, in order that attendance arrangements can be made.
- .2 Submit samples and/or materials required for testing, as specifically requested in specifications. Submit with reasonable promptness and in an orderly sequence so as not to cause delay in the Work.
- .3 Provide labour and facilities to obtain and handle samples and materials on site. Provide sufficient space to store, cure and inspect test samples.

3.3 QUALITY OF THE WORK

- .1 Quality of the Work shall be first class, executed by workers experienced and skilled in the respective duties for which they are employed. Immediately notify the Consultant if required work is such as to make it impractical to produce required results.
- .2 Do not employ any unfit person or anyone unskilled in their required duties. The Consultant reserves the right to require the dismissal from the site, of workers deemed incompetent, careless, insubordinate or otherwise objectionable.

3.4 DEFECTIVE MATERIALS AND WORK

- .1 Refer to GC 2.4 of CCDC 2-2020.
- .2 Where evidence exists that defective work has occurred, or that work has been carried out incorporating defective products, the Consultant may have independent tests, inspections, or surveys performed in order to determine if work is defective.

- .3 Tests, inspections, or surveys carried out under these circumstances will be made at the Contractor's expense in the event of defective work, or at the Owner's expense where work is in conformance. Where tests incorporate a number of samples, payment will be assessed, by the Consultant, based on the ratio of conforming to non-conforming results. This does not include re-testing of soil compaction during placement, where evidence exists of non-conformance with the Contract documents, but rather only if re-testing is called for after completion of compaction.

END OF SECTION

1 GENERAL

1 SECTION INCLUDES

- .1 Codes and Standards.
- .2 Authority Having Jurisdiction.
- .3 Health and Safety Guidelines for Work in Occupied Buildings.
- .4 Permits and Fees.
- .5 Relics, Antiquities and Human Remains.

2 CODES AND STANDARDS

- .1 Codes
 - .1 All construction shall conform to the Ontario Building Code, the National Building Code (NBC) and the National Fire Code (NFC) latest editions including all supplements and amendments.
 - .2 Conform to all other codes, by-laws and regulations as specified within individual sections of the specifications.
- .2 Industry Standards
 - .1 Industry Standards are specified within individual sections as applicable to those portions of the Work. The latest editions of all industry standards shall be the standards for which quality of work shall be assessed.
 - .2 Comply with all relevant codes, standards and industry-accepted practices, as specified herein, or as applicable to the Work.

3 AUTHORITIES HAVING JURISDICTION

- .1 The Chief Building Official of the Municipality of the Place of the Work, is the primary Authority Having Jurisdiction for compliance with all codes, by-laws and regulations as they apply to all construction.
- .2 Other Authorities Having Jurisdiction may be required to review and approve certain portions of the Work. The Chief Building Official of the Municipality of the Place of the Work, will determine the requirements for such involvement.

4 HEALTH AND SAFETY GUIDELINES FOR WORK IN OCCUPIED BUILDINGS

- .1 The Contractor shall conform with requirements of KPRDSB Health and Safety Guidelines for Work in Occupied Buildings, as appended to this Section.

5 PERMITS AND FEES

- .1 No construction work may commence without a valid, posted Building Permit.
- .2 The Owner is responsible for obtaining all necessary information and applying for the Building Permit, including payment of associated fees.
- .3 The Contractor is responsible for applying for, and obtaining all necessary permits, licenses, or certificates required by the Work.

- .4 Authorities Having Jurisdiction may levy fees for issuing permits, licenses, or certificates under their jurisdiction. The Contractor shall pay all such fees as required, and shall include the cost of such fees in their Contract Price.
 - .5 Furnish certificates and permits from other Authorities Having Jurisdiction when so requested by the Consultant.
 - .6 Prior to commencement of construction, post the Building Permit at the Place of the Work.
- 6 RELICS, ANTIQUITIES AND HUMAN REMAINS
- .1 Comply with the General Conditions of the Contract with respect to relics, antiquities, and human remains.
 - .2 Isolate and protect human remains, relics, antiquities, items of historical, archeological or scientific interest such as cornerstones, commemorative plaques, inscribed tablets and other similar objects found during the course of the Work.
 - .3 If such items are discovered in the course of construction, stop work in the immediate vicinity, and give immediate notice to the Consultant as to the nature of the discovery, and await written instructions before proceeding with work in the area.
 - .4 Resume work only after the conclusion of any inspection and evaluation by experts engaged by the Owner, and only after being given permission to do so.
 - .5 Relics, antiquities and items of historical or specific interest remain the Owner's property.

END OF SECTION

Abbreviations listed, when used in the Contract Documents, shall have the following meanings:

ABBREVIATION	MEANING
AA	ALUMINUM ASSOCIATION
AAMA	ARCHITECTURAL ALUMINUM MANUFACTURERS' ASSOCIATION
AASHO	AMERICAN ASSOCIATION OF STATE HIGHWAY OFFICIALS
ACI	AMERICAN CONCRETE INSTITUTE
AGA	AMERICAN GAS ASSOCIATION
AIA	AMERICAN INSTITUTE OF ARCHITECTS
AIMA	ACOUSTICAL & INSULATING MATERIALS ASSOCIATION
AISC	AMERICAN INSTITUTE OF STEEL CONSTRUCTION
AISI	AMERICAN IRON AND STEEL INSTITUTE
AMCA	AIR MOVING AND CONDITIONING ASSOCIATION INC.
ANSI	AMERICAN NATIONAL STANDARDS INSTITUTE
ASHRAE	AMERICAN SOCIETY OF HEATING, REFRIGERATING & AIR CONDITIONING ENGINEERS
ASTM	AMERICAN SOCIETY FOR TESTING AND MATERIALS
AWI	ARCHITECTURAL WOODWORK INSTITUTE (USA)
AWMAC	ARCHITECTURAL WOODWORK MANUFACTURERS ASSOCIATION OF CANADA
AWS	AMERICAN WELDING SOCIETY
CCA	CANADIAN CONSTRUCTION ASSOCIATION
CCRC	CANADIAN CODE FOR RESIDENTIAL CONSTRUCTION
CEC	CANADIAN ELECTRICAL CODE
CFUA	CANADIAN FIRE UNDERWRITERS ASSOCIATION
CGA	CANADIAN GAS ASSOCIATION
CGSB	CANADIAN GENERAL STANDARDS BOARD
CIQS	CANADIAN INSTITUTE OF QUANTITY SURVEYORS
CISC	CANADIAN INSTITUTE OF STEEL CONSTRUCTION
CITC	CANADIAN INSTITUTE OF TIMBER CONSTRUCTION
CLA	CANADIAN LUMBERMEN'S ASSOCIATION
CMHC	CANADA MORTGAGE & HOUSING CORPORATION
COFI	COUNCIL OF FOREST INDUSTRIES OF BRITISH COLUMBIA
CPCI	CANADIAN PRESTRESSED CONCRETE INSTITUTE
CRCA	CANADIAN ROOFING CONTRACTORS ASSOCIATION
CSA	CANADIAN STANDARDS ASSOCIATION
CSC	CONSTRUCTION SPECIFICATIONS CANADA
CSI	CONSTRUCTION SPECIFICATIONS INSTITUTE (USA)
CSPI	CORRUGATED STEEL PIPE INSTITUTE
CSSBI	CANADIAN SHEET STEEL BUILDING INSTITUTE
CUA	CANADIAN UNDERWRITERS' ASSOCIATION
CWB	CANADIAN WELDING BUREAU
CWC	CANADIAN WOOD COUNCIL
DND	DEPARTMENT OF NATIONAL DEFENCE, CANADA
FM	FACTORY MUTUAL ENGINEERING CORPORATION
FS	FEDERAL SPECIFICATION (USA)
IES	ILLUMINATING ENGINEERING SOCIETY
IGMAC	INSULATED GLASS MANUFACTURERS ASSOCIATION OF CANADA
LTIC	LAMINATED TIMBER INSTITUTE OF CANADA
MIA	MARBLE INSTITUTE OF AMERICA
MPMDD	MODIFIED PROCTOR MAXIMUM DRY DENSITY
NAAMM	NATIONAL ASSOCIATION OF ARCHITECTURAL METAL MANUFACTURERS (USA)

NBFU	NATIONAL BOARD OF FIRE UNDERWRITERS
NBC	NATIONAL BUILDING CODE OF CANADA
NBS	NATIONAL BUREAU OF STANDARDS (USDC)
NEMA	NATIONAL ELECTRICAL MANUFACTURERS' ASSOCIATION
NFPA	NATIONAL FIRE PROTECTION ASSOCIATION
NHLA	NATIONAL HARDWOOD LUMBER ASSOCIATION (USA)
NLGA	NATIONAL LUMBER GRADES AUTHORITY
NRC	NATIONAL RESEARCH COUNCIL
OBC	ONTARIO BUILDING CODE
OHSA	OCCUPATIONAL HEALTH AND SAFETY ACT
OPSS	ONTARIO PROVINCIAL STANDARD SPECIFICATIONS
PCA	PORTLAND CEMENT ASSOCIATION
PCI	PRESTRESSED CONCRETE INSTITUTE
SDI	STEEL DECK INSTITUTE
SPMDD	STANDARD PROCTOR MAXIMUM DRY DENSITY
SSPC	STEEL STRUCTURES PAINTING COUNCIL
TTMAC	TERRAZZO, TILE & MARBLE ASSOCIATION OF CANADA
ULC	UNDERWRITERS LABORATORIES CANADA
UL	UNDERWRITERS LABORATORIES (USA)
USAS	UNITED STATES OF AMERICA STANDARDS INSTITUTE
WSIB	WORKPLACE SAFETY AND INSURANCE BOARD

END OF SECTION

- 1 REFERENCES
 - .1 Occupational Health and Safety Act and Regulations for Construction Projects (2000) (Ontario Regulation 213/91, amended by Reg. 631/94, & Reg. 145/00).
 - .2 National Fire Code of Canada (2020)
 - .3 Ontario Fire Code (2020)
 - .4 Ontario Building Code (2024)
- 2 INSTALLATION AND REMOVAL
 - .1 Provide temporary utilities, facilities and controls in order to execute the work expeditiously. Remove from site all such work after use.
- 3 VEHICULAR ACCESS & PARKING
 - .1 Provide and maintain adequate access to project site.
 - .2 Build and maintain temporary access roads where indicated or required, and provide snow removal during period of work.
 - .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 Contractor's use of roads. Maintenance shall include regular snow removal if not provided under separate contract, and regular power washing to remove mud and dirt.
 - .4 Where site access for construction vehicles necessitates use of public roads, remove mud and dirt from such roads where contaminated by construction vehicles.
 - .5 Traffic Control: Provide and maintain flagpersons, traffic signals, barricades and flares, lights, or lanterns as required to perform the work and protect the public.
 - .6 Construction Parking
 - .1 Parking for construction equipment vehicles will be limited to the site or immediate areas of work.
 - .2 Parking for Contractors' and Subcontractors' personal vehicles will be limited to Construction Site provided it does not constitute a safety hazard nor disrupt the performance of Work.
- 4 TEMPORARY UTILITIES
 - .1 Temporary Electricity and Lighting
 - .1 Arrange, pay for and maintain temporary electrical power supply in accordance with governing regulations and ordinances.
 - .2 Install temporary facilities for power such as pole line and underground cables to approval of local power supply authority.
 - .3 Electrical power and lighting systems installed under this contract can be used for construction requirements provided that guarantees are not affected thereby. Make good damage. Replace lamps which have been used more than a period of 3 months.

- .4 Provide temporary lighting in all areas of construction, to the minimum requirements of the Occupational Health and Safety Act, and minimum requirements specified herein.

- .2 Temporary Water Supply
 - .1 Arrange, pay for and maintain temporary water supply in accordance with governing regulations and ordinances.

 - .2 Permanent water supply system installed under this contract can be used for construction requirements provided that guarantees are not affected thereby. Make good damage.

- .3 Temporary Heating and Ventilating
 - .1 Provide and maintain all temporary heat and ventilation necessary during construction, including cost of installation, fuel, operation, attendance and maintenance. Use of direct-fired heaters discharging waste products into work areas will not be permitted unless prior approval is given by Consultant.

 - .2 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.

 - .3 Maintain minimum temperature of 10°C or higher where construction is in progress and maintain until acceptance of structure by Consultant.

 - .4 Ventilating
 - .1 Prevent hazardous accumulation 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 a time after cessation of work process, to assure removal of harmful elements.

 - .5 Maintain strict supervision or operation of temporary heating and ventilating equipment.
 - .1 Conform with applicable codes and standards.
 - .2 Enforce safe practices.
 - .3 Prevent abuse of services.

- .4 Prevent damage to finishes.
 - .5 Vent direct-fired combustion units to outside.

 - .6 The permanent HVAC systems of the building, or portions thereof, may not be used during construction.
- 5 CONSTRUCTION FACILITIES
- .1 Field Office
 - .1 Provide minimum 2400 x 4800mm office and furnish with desk, drawing layout table, filing cabinet, and coat hooks.
 - .2 Provide minimum 750 Lx lighting level.
 - .3 Heat to maintain 22°C inside temperature.
 - .4 Provide 2 operable windows for cross ventilation, or air condition.
 - .2 Temporary Communication
 - .1 Provide and pay for temporary communication systems to be installed in Field Office.
 - .2 Provide hard wire and wireless high speed internet access.
 - .3 Cellular telephones are acceptable. Pay telephone is not acceptable.
 - .3 Equipment, Tools and Materials Storage
 - .1 Provide adequate weathertight enclosures with raised floors, for storage of materials, tools, and equipment which are subject to damage by weather.
 - .2 Temporary enclosures required by subtrades as workshops shall be provided by those trades.
 - .4 Site Storage and Overloading
 - .1 Confine the Work and the operations of employees to limits indicated by the Contract Documents. Do not unreasonably encumber the premises with products.
 - .2 Do not load or permit to be loaded any part of the Work with a weight or force that will endanger the Work.
 - .5 Sanitary Facilities
 - .1 Provide sanitary facilities for work force in accordance with governing regulations and ordinances. Post notices and take such precautions as required by local health authorities. Keep area and premises in sanitary condition. Where portable toilet facilities are provided, empty and sanitize such facilities on a weekly basis, or more frequently if required.
 - .2 Permanent new facilities shall not used by the Contractor.

6 CONSTRUCTION SAFETY MEASURES

- .1 Observe all construction safety measures as required by the General Conditions of the Contract, the Occupational Health and Safety Act and Regulations for Construction Projects, and by all authorities having jurisdiction, provided that in case of conflict or discrepancy, the more stringent requirements shall apply.
- .2 Provide applicable spare safety equipment such as helmets, safety glasses, and harnesses, and enforce their use by Consultants, the Owner, their representatives and any authorized visitors to the site.
- .3 Provide and maintain fences, gates and locks, covered walkways, guard rails, barriers, night lights, and appropriate warning signage as required for the protection of the public, and of public and private property; as required by the General Conditions of the Contract, the Occupational Health and Safety Act and Regulations for Construction Projects, and by all authorities having jurisdiction. Erect and maintain sturdy railings around shafts, and the like, to protect workmen and the public from injury.
- .4 Workplace Hazardous Materials Information System
 - .1 Comply with all requirements of Workplace Hazardous Materials Information System (WHMIS) regarding use, handling, storage, and disposal of hazardous materials; and regarding labelling and provision of material safety data sheets.
 - .2 Include copies of all WHMIS data sheets in Operations and Maintenance Manuals.

7 CONSTRUCTION AIDS

- .1 Falsework
 - .1 Design and construct falsework in accordance with CSA S269.1.
- .2 Scaffolding
 - .1 Design, construct and maintain scaffolding in accordance with CSA S269.2.
 - .2 Erect scaffolding independent of walls. Remove promptly when no longer required.
- .3 Hoisting
 - .1 Provide, operate and maintain hoists or cranes required for moving of workers, materials and equipment. Make financial arrangements with Subcontractors for use thereof.
 - .2 Hoists or cranes shall be operated by qualified operator.

8 TEMPORARY BARRIERS & ENCLOSURES

- .1 Construction Isolation Fencing
 - .1 Erect isolation fencing around perimeter of construction areas to protect the public, workers, and the public from injury.

- .2 Construction Isolation Fencing shall consist of:
 - .1 Temporary modular welded wire mesh fencing, minimum 1828 x 2440mm high, by CanFence Rentals Ltd., or equivalent.
- .2 Provide lockable gates within hoarding / fencing for access to site by workers and vehicles.
- .3 Provide barriers around trees and planting beds designated to remain. Protect from damage.
- .4 Enclosure of Structure
 - .1 Provide temporary weathertight enclosures and protection for exterior openings until permanently enclosed.
 - .2 Erect enclosures to allow access for installation of materials and working inside enclosure.
 - .3 Erect enclosures to withstand wind pressure and snow loading.
 - .4 Close off floor areas where walls are not finished; seal off other openings; enclose building interior work area for temporary heat.
- .5 Dust Control
 - .1 Provide dust tight screens or partitions to localize dust generating activities, and for the protection of workers, or finished areas of Work.
 - .2 Dust screens shall consist of, as a minimum, 0.15mm thick fire retardant polyethylene sheets secured to appropriate framing and sealed at all joints and at perimeter to prevent migration of dust
 - .1 Poly sheet: Polytarp, Super Six by Polytarp Products or approved alternative.
 - .3 Maintain and relocate protection until such work is complete.
 - .4 Provide dust catching walk-off matting, at all construction entrances.
- 9 TEMPORARY CONTROLS
 - .1 Drainage & Erosion Control
 - .1 Refer to Section 01 57 19 – Temporary Environmental Controls and Site Grading & Servicing drawings.
 - .2 Tree and Plant Protection
 - .1 Refer to Section 01 57 19 – Temporary Environmental Controls and Landscape drawings.

.3 Security Measures

- .1 Where progress of construction reaches point where building exterior is fully enclosed, provide construction cylinders for doors, and secure building against intrusion. Where installation of fixtures and equipment, or storage of materials and equipment, inside the building has begun prior to installation of exterior windows and doors, provide temporary plywood enclosures for window and door openings to prevent intrusion until permanent closures are in place.
- .2 Extent of security services shall be at the sole discretion of the Contractor (except as noted in item .3 below) and all costs incurred shall be paid for by the Contractor. Note that the fit, finish and new appearance of the finished building will not be compromised to accommodate temporary security provisions. Materials, products, finishes, etc. damaged due to vandalism are to be restored and/or replaced to an as-new condition.
- .3 Commencing at a date which is four (4) months prior to the scheduled date for Substantial Performance, Contractor shall arrange and pay for the provision of "after hours" manned security at the project site. Security shall provide surveillance and oversight of the building and site areas, during all times when the Contractor's construction personnel are not in attendance. Continue services until time of substantial completion.

.4 Site Signs and Notices

- .1 Maintain approved signs and notices in good condition for duration of project, and dispose of off site on completion of project or earlier if directed by Consultant.
- .2 No other signs or advertisements of any description except notices regarding safety and instruction, shall be put up around the building, or site, without the approval of the Consultant.

END OF SECTION

1 REFERENCES

- .1 National Building Code of Canada (2020)
- .2 National Fire Code of Canada (2020)
- .3 Ontario Fire Code (2007)
- .4 Guidelines for Maintaining Fire Safety during Construction in Existing Buildings, (10/31/88) Ontario Ministry of the Solicitor General, Office of the Fire Marshal.
- .5 Ontario Building Code (Regulation 350/06)

2 FIRE SAFETY

- .1 Fire Fighting Equipment
 - .1 Provide and maintain in working order, ULC labelled, 9kg 4A 60BC type fire extinguishers, and locate in prominent positions to approval of authorities having jurisdiction.
- .2 Fire Department Access
 - .1 Provide and maintain fire access routes as designed, as soon as construction sequence will allow. Access routes must have compacted granular subbase, and base in place before superstructure of building may proceed.
 - .2 Construction activities must not obstruct access routes designated for fire department equipment. If necessary that existing access be obstructed or deleted, alternative access, acceptable to the fire department, must be provided prior to commencement of construction, in accordance with Ontario Building Code location and design criteria for required access routes.
- .3 Control of Combustible Materials
 - .1 The stockpiling of construction materials adjacent to the existing building must be carefully controlled in accordance with the Ontario Fire Code. Materials stored, and their proximity to, equipment used in construction may create a fire hazard. Control of combustibles on a construction site is regulated under the Occupational Health and Safety Act.
- .4 Hot Work
 - .2 Conform to the requirements of the Occupational Health and Safety Act – Regulations for Construction Projects.
 - .3 Provide all necessary guards and barriers to protect workers, property, and the public when performing hot work such as torching, cutting or coring. Protect all adjacent combustible materials.
 - .4 Provide a "Fire Watch" for a minimum of 3 hours after each instance of discontinuing hot work.

END OF SECTION

1 DEFINITIONS

- .1 Environmental Pollution and Damage: presence of chemical, physical, biological elements or agents which adversely affect human health and welfare; unfavourably alter ecological balances of importance to human life; affect other species of importance to humankind; or degrade environment aesthetically, culturally and/or historically.
- .2 Environmental Protection: prevention/control of pollution and habitat or environment disruption during construction. Control of environmental pollution and damage requires consideration of land, water, and air; biological and cultural resources; and includes management of visual aesthetics; noise; solid, chemical, gaseous, and liquid waste; radiant energy and radioactive material as well as other pollutants.

2 SUBMITTALS

- .1 Submittals: in accordance with Submittal Procedures.
- .2 Prior to commencing construction activities or delivery of materials to Site, submit Environmental Protection Plan for review and approval by Consultant. Environmental Protection Plan is to present comprehensive overview of known or potential environmental issues which must be addressed during construction.
- .3 Address topics at level of detail commensurate with environmental issue and required construction tasks.
- .4 Environmental protection plan: include:
 - .1 Name(s) of person(s) responsible for ensuring adherence to Environmental Protection Plan;
 - .2 Name(s) and qualifications of person(s) responsible for manifesting hazardous waste to be removed from Site;
 - .3 Name(s) and qualifications of person(s) responsible for training site personnel;
 - .4 Descriptions of environmental protection personnel training program;
 - .5 Erosion and sediment control plan which identifies type and location of erosion and sediment controls to be provided including monitoring and reporting requirements to assure that control measures are in compliance with erosion and sediment control plan, Federal, Provincial and Municipal laws and regulations;
 - .6 Drawings showing locations of proposed temporary excavations or embankments for haul roads, stream crossings, material storage areas, structures, sanitary facilities and stockpiles of excess or spoil materials including methods to control runoff and to contain materials on Site;

- .7 Traffic control plans including measures to reduce erosion of temporary roadbeds by construction traffic, especially during wet weather. Plans include measures to minimize amount of mud transported onto paved public roads by vehicles or runoff;
 - .8 Work area plan showing proposed activity in each portion of area and identifying areas of limited use or non-use. Plan to include measures for marking limits of use areas including methods for protection of features to be preserved within authorized work areas;
 - .9 Spill Control Plan: including procedures, instructions, and reports to be used in event of unforeseen spill of regulated substance;
 - .10 Non-Hazardous solid waste disposal plan identifying methods and locations for solid waste disposal including clearing debris;
 - .11 Air pollution control plan detailing provisions to assure that dust, debris, materials, and trash, do not become air borne and travel off-site;
 - .12 Contaminant prevention plan that: identifies potentially hazardous substances to be used on Site; identifies intended actions to prevent introduction of such materials into air, water or ground; and details provisions for compliance with Federal, Provincial, and Municipal laws and regulations for storage and handling of these materials;
 - .13 Waste water management plan that identifies methods and procedures for management and/or discharge of waste waters which are directly derived from construction activities, such as concrete curing water, clean-up water, dewatering of ground water, disinfection water, hydrostatic test water and water used in flushing of lines;
 - .14 Historical, archaeological, cultural resources biological resources and wetlands plan that defines procedures for identifying and protecting historical, archaeological, cultural resources, biological resources and wetlands;
 - .15 Pesticide treatment plan: to be included and updated, as required.
- 3 FIRES
- .1 Fires and burning of rubbish on Site is strictly prohibited.
- 4 DISPOSAL OF WASTES
- .1 Burying of rubbish and waste materials on Site is strictly prohibited.
 - .2 Do not dispose of waste or volatile materials, such as mineral spirits, oil or paint thinner into waterways, storm or sanitary sewers.

5 DRAINAGE & EROSION CONTROL

- .1 Provide erosion and sediment control plan that identifies type and location of erosion and sediment controls to be provided. Plan: include monitoring and reporting requirements to assure that control measures are in compliance with erosion and sediment control plan, Federal, Provincial, and Municipal laws and regulations.
- .2 Storm Water Pollution Prevention Plan (SWPPP) may be substituted for erosion and sedimentations control plan.
- .3 Provide temporary drainage and pumping as necessary to keep excavations and Site, free from water.
- .4 Do not pump water containing suspended materials into waterways, sewer or drainage systems.
- .5 Control disposal or runoff of water containing suspended materials or other harmful substances in accordance with local authority requirements.
- .6 Provide and maintain temporary drainage and pumping as necessary to keep excavations and site free from excess water.
- .7 Provide silt fencing at site perimeters and where required by local authorities to prevent contamination of adjoining properties from silt and water drainage.

6 TREE AND PLANT PROTECTION

- .1 Protect existing trees and plants on all adjacent properties, where in close proximity to construction activities, or where construction access passes within 3m of trees or plants, whether indicated on drawings or not.
- .2 Conform to all local By-Laws regarding tree preservation and protection.
- .3 Protect existing trees and plants on site as indicated.
- .4 Restrict tree removal to those designated by Consultant. Wrap in burlap trees and shrubs adjacent to construction work, storage areas and trucking lanes. Encase trees and shrubs with protective wood framework from grade level to height of 2134mm.
- .5 Protect roots to minimum 1m beyond dripline during excavation and site grading to prevent disturbance or damage. Avoid unnecessary traffic, dumping and storage of materials over root zones of protected trees. Minimize stripping of topsoil and vegetation.

- .6 The Minimum Tree Protection Zone will be the drip line. Within this tree protection zone there will also be no construction activity including but not limited to no root cutting, no alteration or disturbance to existing grades of any kind, no changes to the grade by adding fill, excavating or scraping, no storage of construction materials or equipment, no stockpiling of soil, debris or construction waste, & no movement or storage of heavy vehicles or equipment. Tree protection barriers must be included and priced as part of the project. For short term project (up to 2 months), standard T-bars and plastic safety fence can be used. For a longer term project, use 10 gauge chain link fence and standard T-bars. In all cases, standard T-bars should not be spaced more than 6 to 7 feet apart. These protection barriers must be erected before the project starts, must be maintained throughout the project, and taken down when final inspection and signoffs are completed.
- 7 **WORK ADJACENT TO WATERWAYS/DRAINAGE DITCHES**
 - .1 Do not operate construction equipment in waterways.
 - .2 Do not use waterway beds for borrow material.
 - .3 Do not dump excavated fill, waste material or debris in waterways.
 - .4 Design and construct temporary crossings to minimize erosion to waterways.
 - .5 Do not skid construction materials across waterways.
 - .6 Avoid indicated spawning beds constructing temporary crossings of waterways.
- 8 **POLLUTION CONTROL**
 - .1 Maintain temporary erosion and pollution control features installed under this Contract.
 - .2 Prevent sandblasting and other extraneous materials from contaminating air and waterways beyond application area, by providing temporary enclosures.
 - .3 Cover or wet down dry materials and rubbish to prevent blowing dust and debris. Provide dust control for temporary roads.
- 9 **HISTORICAL / ARCHAEOLOGICAL ARTIFACTS**
 - .1 In the event that buried archaeological remains are encountered on the property during construction activities, the Heritage Operations Unit of the Ministry of Tourism and Culture be notified immediately.
 - .2 In the event that human remains are encountered during construction, the proponent should immediately contact both the Ministry of Tourism and Culture, and the Registrar or Deputy Registrar of Cemeteries at the Cemeteries Regulation Unit, Ministry of Government Services, (416) 326-8404.

10 NOTIFICATION

- .1 Consultant will notify Contractor in writing of observed non-compliance with Federal, Provincial or Municipal environmental laws or regulations, permits, and other elements of Contractor's Environmental Protection plan. Contractor shall, after receipt of such notice, inform Consultant of proposed corrective action and take such action for approval by Consultant.
- .2 Consultant will issue stop order of Work until satisfactory corrective action has been taken.
- .3 No time extensions granted or equitable adjustments allowed to Contractor for such suspensions.

END OF SECTION

1 PRODUCT OPTIONS

- .1 Provide products specified under individual specification sections. Where Specification lists two or more products, or two or more manufacturers of the same product, the Contractor may select one of the listed products or manufacturers. Confirm selection of products and manufacturers when requested by the Consultant.
- .2 When only one product or manufacturer is listed in the specifications, it is intended that only that product or manufacturer is acceptable.

2 PRODUCT SUBSTITUTION PROCEDURES

- .1 Substitution Procedures During Construction
 - .1 Products may only be substituted during the Construction period for one or more of the following reasons:
 - .1 Insolvency of the product manufacturer.
 - .2 Inability of the manufacturer to provide the product(s) in the timeframe required to maintain the construction schedule.
 - .3 Product specified has been discontinued.
 - .4 Substitution proposed offers better performance than that specified, at no additional cost.
 - .5 Substitution offers equivalent performance to that specified, at a reduced cost to the Owner (reduction in Contract Price).
 - .2 Items 2.1.1.2, and 2.1.1.3 will require a letter from the manufacturer, confirming their inability to provide the products specified, or inability to meet the schedule.
 - .3 Items 2.1.1.4, and 2.1.1.5 will be at the discretion of the Owner.

3 AVAILABILITY

- .1 Immediately upon signing Contract, review Product delivery requirements, and identify lead times for supply of all Products. If lead times in supply of Products may affect the Construction Schedule, notify the Consultant in order that appropriate action may be authorized in ample time to prevent delay in performance of the Work.
- .2 The Contractor shall order Products and materials in a timely fashion so as to ensure that delivery of such Products and materials shall coincide with the Construction Schedule. Failure of the Contractor or their Subcontractors to order Products and materials in a timely fashion, shall not be cause for substitution in accordance with the criteria set out under Article 2 – Product Substitution Procedures.
- .3 In the event of failure to notify the Consultant of Product delivery problems at the commencement of the Work, and should it appear that the Work may be delayed for such reason, the Consultant reserves the right to substitute more readily available Products of similar character of their choosing, at no increase in Contract Price.

4 REFERENCE STANDARDS

- .1 Within the specifications, reference standards are identified. Conform to these standards, in whole or part, as specifically requested.

- .2 If there is question as to whether any product or system is in conformance with applicable standards, the Consultant reserves the right to have such products or systems tested to prove or disprove conformance.
 - .3 The cost for such testing will be born by the Owner in the event of conformance with Contract Documents or by the Contractor in the event of non-conformance.
 - .4 Conform to latest date of issue of referenced standards in effect on date of submission of bids, except where a specific date of issue is specifically noted.
- 5 **PRODUCT TRANSPORTATION & DELIVERY**
- .1 Transportation and delivery costs of Products required in the performance of the Work, are included in the Contract Price.
 - .2 Transportation and delivery costs of Products supplied by the Owner will be paid for by the Owner. Unload, handle, and store such Products on site.
 - .3 Products must be appropriately crated, skidded, boxed, shrink-wrapped, or otherwise packaged to protect such products from damage during shipment. Products which arrive at the site in a damaged condition must be rejected and returned to the supplier/manufacturer for immediate replacement.
 - .4 Advise the Owner 30 days in advance of anticipated delivery dates for materials and equipment supplied by the Owner.
- 6 **PRODUCT STORAGE, HANDLING AND PROTECTION**
- .1 Handle and store Products in a manner to prevent damage, adulteration, deterioration and soiling and in accordance with manufacturer's instructions.
 - .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 the 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 paints in a 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 the satisfaction of the Consultant.

7 MANUFACTURER'S INSTRUCTIONS

- .1 Unless otherwise indicated in the specifications, install or erect Products in accordance with manufacturer's printed 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 the specifications and manufacturer's instructions, so that Consultant may establish correct course of action.
- .3 Improper installation or erection of Products, due to failure in complying with these requirements, authorizes the Consultant to require removal, replacement where necessary, and re-installation at no increase in Contract Price.

8 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 the affected specification Section.
- .4 Space anchors within limits of load limit or shear capacity and ensure that 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.
- .7 Obtain Consultant's approval before using explosive actuated fastening devices.

9 QUALITY OF MATERIALS

- .1 Products, materials, equipment and articles (referred to as Products throughout the specifications) incorporated in the Work shall be new, not damaged or defective, and of the best quality (compatible with specifications) for the purpose intended. If requested, furnish evidence as to type, source and quality of Products provided.
- .2 Products relying on uniformity of colour and pattern for appearance, such as resilient flooring, carpeting, fabrics, and vinyl wallcovering, shall be from one dye lot for the project. All products delivered to the site must be labeled as to dye lot, or production run number, as well as production date.

- .3 Defective products, whenever identified prior to the completion of Work, will be rejected, regardless of previous inspections. Inspection does not relieve responsibility, but is a precaution against oversight or error. Remove and replace defective Products at own expense and be responsible for delays and expenses caused by rejection.
 - .4 Should any dispute arise as to the quality or fitness of Products, the Consultant may request additional testing based upon the requirements of the Contract Documents, to confirm acceptability of products or materials. Refer to Article 10 - Defective Materials And Work, and Section 01 40 00.
 - .5 Unless otherwise indicated in the specifications, maintain uniformity of manufacture for any particular or like item throughout the building.
 - .6 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.
- 10 DEFECTIVE MATERIALS AND WORK
- .1 Where evidence exists that defective work has occurred, or that work has been carried out incorporating defective products, the Consultant may have independent tests, inspections, or surveys performed in order to determine if work is defective.
 - .2 Tests, inspections, or surveys carried out under these circumstances will be made at the Contractor's expense in the event of defective work, or at the Owner's expense where work is in conformance. Where tests incorporate a number of samples, payment will be assessed, by the Consultant, based on the ratio of conforming to non-conforming results. This does not include re-testing of soil compaction during placement, where evidence exists of non-conformance with the Contract documents, but rather only if re-testing is called for after completion of compaction.
- 12 WARRANTIES & GUARANTEES
- .1 Warrant all products and labour forming part of the Work for the period specified in the Contract, unless otherwise specified herein.
 - .2 Warrant products and assemblies for the specified periods of time where in excess of the Contract Warranty, as specified within their respective sections.
 - .3 Guarantee aspects of the Work for the specified periods of time where in excess of the Contract Warranty, as specified within their respective sections.
 - .4 Warranties and Guarantees shall commence at Date of Substantial Performance of the Contract as certified by the Consultant.
 - .5 Warranties and Guarantees shall be original copies, printed on company letterhead, or on a standard company warranty certificate, bearing the name of the company.

- .6 Warranties and Guarantees shall indicate:
 - .1 Name of the Principal (the Manufacturer/Subcontractor),
 - .2 Name of the Obligee (the Owner),
 - .3 Name and address of Project,
 - .4 Commencement date (Date of Substantial Performance),
 - .5 Duration of warranty or guarantee,
 - .6 Clear statement of what is included, and what if any exclusions there are,
and
 - .7 Signature of Principal's representative having signing authority.

END OF SECTION

- 1 EXAMINATION
 - .1 Acceptance of Conditions
 - .1 The General Contractor shall examine all existing or pre-determined conditions, prior to commencing work in that area, and report to the Consultant all conditions unacceptable for work to proceed. Commencement of work shall imply acceptance of conditions as is.
 - .2 Subcontractors shall examine all existing or pre-determined conditions affecting their portion of the Work, prior to commencing such work, and report to the Contractor all conditions unacceptable for work to proceed. Commencement of work shall imply acceptance of conditions as is.
- 2 PREPARATION
 - .1 Field Engineering
 - .1 Locate, confirm and protect control points prior to starting the Work. Preserve permanent reference points during construction.
 - .2 Establish reference lines and elevations. Locate and lay out by instrumentation.
 - .2 Records
 - .1 Maintain a complete, accurate log of control points and survey work as work progresses.
- 3 CUTTING AND PATCHING
 - .1 Submit a written request in advance, for approval 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.
 - .5 Work of Owner or separate contractor.
 - .2 Inspect existing conditions, including elements subject to damage or movement during cutting and patching.
 - .3 After uncovering, inspect conditions affecting performance of work. Beginning of cutting or patching means acceptance of existing conditions.
 - .4 Perform cutting, fitting and patching, including excavation and fill, to complete the Work. Perform work to avoid damage to other work.
 - .5 Employ original installer to perform cutting and patching for weather-exposed and moisture-resistant elements, and sight-exposed surfaces.
 - .6 Cut rigid materials using power saw or core drill. Pneumatic or impact tools not allowed.
 - .7 Fit work airtight to pipes, sleeves, ducts, conduit, and other penetrations through surfaces. At penetration of fire-rated wall, ceiling, or floor construction, completely seal voids with fire stopping material, full thickness of construction element.

- .8 Refinish surfaces to match adjacent finishes; for continuous surfaces refinish to nearest intersection; for an assembly, refinish entire unit.
- .9 Provide all openings greater than 200mm in non-structural elements of work for penetrations of mechanical and electrical work. Mechanical and Electrical Subcontractors shall provide all sleeves and locations for sleeves. The cost of all cutting and patching required by Mechanical and Electrical Subcontractors shall be paid for by those trades.
- .10 Ensure that all cutting and patching work, including that by Mechanical and Electrical Subcontractors, is properly performed by the respective trades skilled in that line of work. Restore work with new products in accordance with Contract Documents.

4 LOCATION OF EQUIPMENT AND FIXTURES

- .1 Location of mechanical and electrical equipment, fixtures and devices indicated or specified, are to be considered as approximate. Final location of such items will be determined on site, based on integration with structural and architectural elements, and as required by coordination with other trades. In the event of a conflict, final determination of location of these items rests with the Consultant.
- .2 Prepare and submit for review by the Consultant, interference field drawings, to indicate relative position of various services and equipment, at the following locations as a minimum:
 - .1 Under all rooftop mechanical units.
 - .2 At locations of all major ductwork, piping, and conduit crossovers.
 - .3 Where ductwork passes under major structural elements.
- .3 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.
- .4 Request a review of items by Consultant once rough-in is underway, prior to final installation, and obtain approval for actual locations.

5 CONCEALMENT

- .1 Conceal pipes, ducts and wiring in floor, wall and ceiling construction of finished areas, except where indicated otherwise.
- .2 In existing building, all pipes shall be enclosed in shafts. All conduit shall be placed in accordance with approved conduit shop drawings.

6 LIGHTING FIXTURES AT SUSPENDED CEILINGS

- .1 Ensure that secure support is provided for lighting fixtures by suspended ceilings, or by separate hangers, or by both.
- .2 Coordinate the ceiling system and lighting fixture installations to provide adequate support.

.3 Submit affidavits with acceptable design information confirming that the installation of the suspended ceiling system and/or separate fixture hangers will provide adequate support for the lighting fixtures without exceeding specified deflection tolerances for the ceiling system.

.4 Conform to current requirements of the Electrical Safety Authority (ESA).

7 EXISTING SERVICES

.1 Where work involves the interruption of, or connection to existing services, carry out such work as directed by governing authorities, with minimum of disturbance to pedestrian and vehicular traffic.

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

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

.4 Provide adequate bridging over trenches which cross sidewalks or roads to permit normal traffic.

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

.6 Remove abandoned service lines to distance of 1821mm from foundations. Cap or otherwise seal lines at cut-off points as directed by Consultant.

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

8 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 the Consultant, at no increase in Contract Price.

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

.3 Protect finished surfaces with overlays of protective materials such as Kraft paper, cardboard, or plywood, as required for individual applications to provide adequate protection.

END OF SECTION

1 GENERAL

- .1 Conduct cleaning and disposal operations to comply with local ordinances and environmental protection legislation.
- .2 Store volatile wastes in covered metal containers, and remove from premises at end of each working day.
- .3 Provide adequate ventilation during use of volatile or noxious substances. Use of building ventilation systems is not permitted for this purpose.

2 CLEANING DURING CONSTRUCTION

- .1 Maintain the Work in tidy condition, free from accumulation of waste products and debris.
- .2 Remove waste material and debris from the work areas and deposit in waste container at the end of each working day.
- .3 Vacuum clean interior areas prior to start of finishing work. Maintain areas free of dust and other contaminants during finishing operations.
- .4 Individual Subcontractors are responsible for the daily clean-up and removal of debris related to, or generated by, their own work. The overall responsibility for project cleanliness rests with the Contractor.

3 WASTE MANAGEMENT

- .1 Audit, separate and dispose of construction waste generated by new construction or by demolition of existing structures in whole or in part, in accordance with Ontario Regulations 102/94 and 103/94 made under the Environmental Protection Act.
- .2 Fires, and burning of rubbish or waste on site is prohibited.
- .3 Burying of rubbish or waste materials, except as specified herein, is prohibited.
- .4 Disposal of waste or volatile materials such as mineral spirits, oil, gasoline or paint thinner into ground, waterways, or sewer systems is prohibited.
- .5 Empty waste containers on a regular basis to prevent contamination of site and adjacent properties by wind-blown dust or debris.

4 FINAL CLEANING OPERATIONS

- .1 Immediately following Date of Substantial Performance, and prior to Owner occupancy of the building or portion of the building affected by the Work, conduct full and complete final cleaning operations.
- .2 Final cleaning operations shall be performed by an experienced professional cleaning company, possessing equipment and personnel sufficient to perform full building cleaning operations.

- .3 Remove all surplus products, tools, construction machinery and equipment not required for the performance of remaining work, and thereafter remove any remaining materials, equipment, waste and debris.
- .4 Make arrangements with and obtain permits from authorities having jurisdiction for disposal of waste and debris.
- .5 Use only cleaning materials recommended by manufacturer of surface to be cleaned, and as recommended by cleaning material manufacturer.
- .6 Cleaning operations shall include the removal of all stains, spots, scuff marks, dirt, dust, remaining labels, adhesives or other surface imperfections.
- .7 Remove all paint spots or overspray from all affected surfaces.
- .8 Clean and polish all glass and mirrors. Replace broken, scratched or disfigured glazing. Remove remaining manufacturer's and safety "X" labels.
- .9 Clean and polish all finished metal surfaces such as enamelled or stainless steel, chrome, aluminum, brass, and bronze.
- .10 Clean and polish all vitreous surfaces such as plumbing fixtures, ceramic tile, porcelain enamel, or other such materials.
- .11 Clean all ceramic tile surfaces in accordance with the manufacturer's instructions, and apply final coat of sealer where specified.
- .12 Clean inside of all millwork and cabinetry.
- .13 Vacuum, clean and dust behind grilles, louvres and screens.
- .14 Sealing and waxing of resilient floor surfaces shall be done by Contractor in accordance with manufacturer's written instructions. Coordinate final cleaning and scheduling of sealing and waxing.
- .15 Broom clean and spray wash all exterior paved surfaces.
- .16 Remove dirt and other disfiguration from exterior surfaces.
- .17 Clean all roofs, gutters, downspouts, areaways, drywells, and drainage systems.
- .18 Clean all equipment and fixtures to a sanitary condition, clean or replace filters of mechanical equipment.

END OF SECTION

- 1 INSPECTION AND DECLARATION PROCEDURES
 - .1 Arrange for, conduct and document final inspections, close-out and commissioning at the completion of the Work in accordance with the procedures described in the General Conditions of the Contract, and OAA/OGCA Take-Over Procedures.

- 2 SUBSTANTIAL PERFORMANCE
 - .1 Contractor's Inspection
 - .1 Refer to OAA/OGCA Take-Over Procedures.
 - .2 The Contractor and all Subcontractors shall conduct an inspection of the work, identify deficiencies and defects, and make corrections as required to conform with the Contract Documents. Notify Consultant in writing of satisfactory completion of Contractor's Inspection and that corrections have been made. Request a Consultant's Inspection.
 - .2 Contractor's Application for Substantial Performance of the Work
 - .1 Refer to OAA/OGCA Take-Over Procedures.
 - .2 When the Contractor has carried out the steps in OAA/OGCA Take-Over Procedures, and has determined that the requirements of the Contract have been substantially performed as defined by local Lien legislation, the Contractor shall make application for Substantial Performance of the Work.
 - .3 In addition to the requirements of OAA/OGCA Take-Over Procedures, the following items shall accompany the Contractor's application for Substantial Performance. These items must be complete in all respects, and all verification certificates and reports having been submitted and approved by the Consultants:
 - .1 Completed (and accepted) Maintenance Manuals for all disciplines (No. of copies as specified),
 - .2 As-Built Drawings for all disciplines (No. of copies as specified),
 - .3 Mechanical, Sprinkler, and Electrical as-built CAD drawings,
 - .4 Occupancy Permit (where required by Municipality),
 - .5 Air Balance Report (legible technicians worksheets are acceptable),
 - .6 Gas fired appliances inspection,
 - .7 Plumbing Inspection,
 - .8 Domestic Water Quality Test Report,
 - .9 Sprinkler dry test verification letter stamped and signed by sprinkler design Engineer,
 - .10 Mechanical start-up reports (Boilers, HVAC Units, Chillers, Water Softeners, etc.),
 - .11 Fire Alarm verification (include legible technicians worksheets),
 - .12 Emergency Lighting verification,
 - .13 Electrical distribution system inspection,
 - .14 ESA Hydro Certificate, and
 - .15 Systems operations have been demonstrated to Owner's personnel.

- .3 Consultant's Inspection
 - .1 The Consultants shall perform an inspection of the Work to assess the validity of the Contractors application, and shall identify in separate lists, unfinished work and deficiencies. Contractor shall correct work accordingly.

- .4 Certificate of Substantial Performance
 - .1 Refer to OAA/OGCA Take-Over Procedures.

 - .2 Should the Consultant concur with the Contractor's application for Substantial Performance, the Consultant shall notify the Contractor of approval of the application for Substantial Performance and issue a Certificate of Substantial Performance.

 - .3 The Contractor shall publish a copy of the Certificate of Substantial Performance in a construction trade newspaper, and shall provide the Consultant with proof of the date of publication.

- 3 LIEN PERIOD AND RELEASE OF BASIC HOLDBACK
 - .1 Refer to OAA/OGCA Take-Over Procedures.

 - .2 Commencement of Lien Periods
 - .1 The day following the date of publication of Certificate of Substantial Performance shall be the date of commencement of the 60 day Lien Period prior to release of basic holdback, unless required otherwise by lien statute of the Place of the Work.

 - .2 When the Contractor has carried out the required steps in Stages 3 and 4 of OAA/OGCA Take-Over Procedures, the Contractor shall make application for Release of Basic Holdback.

 - .3 The Consultant shall prepare the Certificate for Payment for release of basic holdback, and promptly upon receipt of the necessary documentation, issue the Certificate for Payment to the Owner.

- 4 FINAL INSPECTION AND PAYMENT
 - .1 Refer to OAA/OGCA Take-Over Procedures.

 - .2 Submit a signed statement stating following have been performed:
 - .1 Work has been reviewed for compliance with Contract Documents,
 - .2 All deficiencies have been corrected,
 - .3 All unfinished work has been completed, and
 - .4 Work is complete and ready for Final Inspection.

 - .3 When items noted above are completed, a final inspection of the Work will be performed by the Owner, the Consultants, and the Contractor.

 - .4 If the Work is deemed to be incomplete, complete outstanding items and request a reinspection.

- .5 If the Work is deemed to be complete, the Consultant will issue a Final Certificate for Payment.

5 DEFICIENCY REVIEW

- .1 Following the issuance of the Certificate of Substantial Performance and prior to the Contractor's application for Final Payment and release of any monies retained as "Finishing Holdback", the Contractor shall continue to complete unfinished work and correct deficiencies. At the request of the Contractor, the Consultants shall conduct up to two general deficiency reviews during this period.
- .2 The first review will be undertaken only if the Contractor has inspected the Work, and states in writing that the unfinished work noted in their application for Substantial Performance has been completed, and at least 50% of all deficiencies have been corrected.
- .3 The second review will be undertaken only if the Contractor has inspected the Work, and states in writing that 90% of the deficiencies have been corrected.
- .4 Should further review by Consultants be required due to failure of the Work to comply with Contract Documents or the criteria set out herein, the Owner will deduct amount of Consultant's compensation for reinspection services from monies owed to the Contractor.

END OF SECTION

- 1 REFERENCES
 - .1 OAA/OGCA Document 100; OAA/OGCA Take-Over Procedures.

- 2 OPERATION AND MAINTENANCE MANUALS
 - .1 General
 - .1 Prepare Operation and Maintenance Manual during the course of construction and have completed prior to Date of Substantial Performance.

 - .2 Submission
 - .1 Maintain one copy of the Operation and Maintenance Manual volume(s) for periodic review and comment, as requested by the Consultant during the course of construction.

 - .2 Submit two (2) final hard copies (one copy for school with all school related documents and two (2) USB device with PDF version of all documents of the final completed volume(s) with the application for Substantial Performance in accordance with OAA/OGCA Document 100.

 - .3 Format
 - .1 Bind data in commercial quality, 219 x 279mm, "D" ring binders, having clear cover and spline pockets.

 - .2 Identify each binder on the cover and spline with the following:
OPERATION & MAINTENANCE MANUALS
St. Theresa Catholic Elementary School
VOLUME ___ OF ___

 - .3 Provide table of contents and index tab sheets for each volume. Itemize and tabulate contents.

 - .4 Provide drawings with reinforced punched binder tab, or insert into clear sleeves in folded format. Group drawings as to content, and index for quick reference.

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

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

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

- .4 Operation and Maintenance Manuals shall contain, as a minimum, the following information:
 - .1 List of Contents; cross-referenced to each Volume.
 - .2 Contact information for maintenance and repairs
 - .3 Warranty and guarantee certificates
 - .4 Equipment start-up and troubleshooting instructions
 - .5 Equipment schematics & diagrams
 - .6 Catalogue of all maintenance materials and quantities
 - .7 Complete list of Contractor, Subcontractors and suppliers, indicating name, address, telephone & fax numbers, email addresses, name of contact person and description of work done.
 - .8 Complete list of products used in the work, indicating product name and manufacturer for each listing.
 - .9 Copy of Finish Hardware List, complete with all amendments and revisions, if applicable.
 - .10 Schedule of paints and coatings. Include sufficient explanation to fully identify each surface with the applicable paint or coating used. Enclose copy of Colour Schedule.
 - .11 All "reviewed" shop drawings.
 - .12 Maintenance instructions for all finished surfaces.
 - .13 Brochures and cuts of all equipment and fixtures.
 - .14 Operating and maintenance instructions for all equipment.
 - .15 All Warranties and Guarantees required by the Specifications for this Work.
 - .5 Refer to Division 21, 22 and 23 for more specific mechanical data required beyond the description of this paragraph.
 - .6 Refer to Division 26 for more specific electrical data required beyond the description of this paragraph.
 - .7 Drawings: supplement product data to illustrate relations of component parts of equipment and systems, to show control and flow diagrams.
 - .8 Typewritten Text: as required to supplement product data. Provide logical sequence of instructions for each procedure, incorporating manufacturer's instructions.
- 3 AS-BUILT DRAWINGS
- .1 Record information on a clean set of black line opaque drawings. Contractor will provide 2 USBs, each with a complete CADD set and a complete PDF set of the project drawings, as well as a PDF set of the complete specifications for the purpose of recording as-built conditions.
 - .2 Maintain as-built drawings on site and update as construction progresses. Allow periodic review by Consultant as requested.
 - .3 Record information concurrently with construction progress. Do not conceal work until required information is recorded.

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

- 4 **EQUIPMENT AND SYSTEMS**
 - .1 Each Item of Equipment and Each System: include description of unit or system, and component parts. Give function, normal operation characteristics, and limiting conditions. Include performance curves, with engineering data and tests, and complete nomenclature and commercial number of replaceable parts.
 - .2 Panel board circuit directories: provide electrical service characteristics, controls, and communications.
 - .3 Include installed colour coded wiring diagrams.
 - .4 Operating Procedures: include start-up, break-in, and routine normal operating instructions and sequences. Include regulation, control, stopping, shut-down, and emergency instructions. Include summer, winter, and any special operating instructions.
 - .5 Maintenance Requirements: include routine procedures and guide for trouble-shooting; disassembly, repair, and reassembly instructions; and alignment, adjusting, balancing, and checking instructions.
 - .6 Provide servicing and lubrication schedule, and list of lubricants required.
 - .7 Include manufacturer's printed operation and maintenance instructions.
 - .8 Include sequence of operation by controls manufacturer.
 - .9 Provide original manufacturer's parts list, illustrations, assembly drawings, and diagrams required for maintenance.
 - .10 Provide installed control diagrams by controls manufacturer.
 - .11 Provide Contractor's coordination drawings, with installed colour coded piping diagrams.
 - .12 Provide charts of valve tag numbers, with location and function of each valve, keyed to flow and control diagrams.

- .13 Provide list of original manufacturer's spare parts, current prices, and recommended quantities to be maintained in storage.
 - .14 Include all test and balancing reports
 - .15 Additional requirements: As specified in individual specification sections.
- 5 MATERIALS AND FINISHES
- .1 Building Products, Applied Materials, and Finishes: include product data, with catalogue number, size, composition, and colour and texture designations. Provide information for re-ordering custom manufactured products.
 - .2 Instructions for cleaning agents and methods, precautions against detrimental agents and methods, and recommended schedule for cleaning and maintenance.
 - .3 Moisture-protection and Weather-exposed Products: include manufacturer's recommendations for cleaning agents and methods, precautions against detrimental agents and methods, and recommended schedule for cleaning and maintenance.
 - .4 Additional Requirements: as specified in individual specifications sections.
- 6 MAINTENANCE MATERIALS, SPARE PARTS & TOOLS
- .1 Provide spare parts in quantities specified in individual specification sections. Provide identical items to those installed in the Work.
 - .2 Provide maintenance materials in quantities specified in individual specification sections. Provide identical items of same manufacturer, dye lot or production run as items in the Work.
 - .3 Provide special tools in quantities specified in individual specification sections, and tag items identifying their function and equipment or products to which they are associated.
 - .4 Receive and catalogue all items. Check inventory and include approved listings in Operations and Maintenance Manual.
 - .5 Obtain receipts for delivered products and submit prior to Substantial Performance.
 - .6 Quality
 - .1 Spare parts, maintenance materials and special tools provided shall be new, not damaged or defective, and of the same quality and manufacture as products provided in the Work.
 - .2 If requested, furnish evidence as to type, source and quality of Products provided.
 - .3 Defective products will be rejected, regardless of previous inspections. Replace products at own expense.

- .7 Delivery, Storage, And Handling
 - .1 Deliver all materials required as maintenance materials, spare parts or special tools, to the site, include shipping costs, and store as directed.
 - .2 Store spare parts, maintenance materials and special tools in a manner to prevent damage, or deterioration.
 - .3 Store in original and undamaged containers with manufacturer's seals or labels intact.
 - .4 Store materials subject to damage from severe climatic changes in a climate-controlled, weatherproof enclosure.
 - .5 Store paints and freezable materials in a moderately heated and ventilated room.

- 7 WARRANTIES AND BONDS
 - .1 Separate each warranty or bond with index tab sheets keyed to Table of Contents listing.
 - .2 List subcontractor, supplier, and manufacturer, with name, address, and telephone number of responsible principal.
 - .3 Obtain warranties and bonds, executed in duplicate by subcontractors, suppliers, and manufacturers, within ten days after completion of the applicable item of work.
 - .4 Start date for all warranties are to be the Date of Substantial Performance, regardless if put into use.
 - .5 Verify that documents are in proper form, contain full information, and are notarized. Co-execute submittals when required.
 - .6 Retain warranties and bonds until time specified for submittal.

END OF SECTION

1 General

1.1 **SECTION INCLUDES**

- .1 Labour, Products, equipment and services necessary for demolition and removals Work in accordance with the Contract Documents.
- .2 Work included: Requirements for demolishing, and removing wholly or in part the various items designated on the drawings or required to be removed or partially removed for the receipt of the Work of this Contract, including not necessarily limited to:
 - .1 Alteration and renovations to existing building.
 - .2 Cutting and removing of walls, floors, ceilings, doors and frames , in the existing buildings as indicated on Drawings.
 - .3 Patching, making good openings and chases in walls, floors, ceilings, including the supply and installation of lintels, channels and finishes.
 - .4 Removal of rubbish, debris, demolished fixtures, fitments and items not scheduled to remain the Owner's property, resulting from the demolition and preparatory work.
 - .5 Remove abandoned services such as conduits, pipes, wiring, ducts, fixtures, equipment, etc. where required for the work or indicated on the drawings.
 - .6 Removal of asphalt pavements, concrete curbs and walks, and other site amenities as indicated on drawings.
 - .7 Removal of all mechanical items including plumbing fixtures, services etc. where required for the work or indicated on drawings and or where not required to be relocated.
 - .8 Removal of existing electrical items including fixtures, etc. where required for the work or indicated on the drawings and not required to be relocated.
 - .9 Dust control during the operations of the work of this Section.
 - .10 Existing building to be suitably protected during all phases of construction.
 - .11 Provide temporary hoarding consisting of 16 mm plywood sheathing, wood studs and 16 mm plywood sheathing with lock-able access door in areas shown on Drawing.
 - .12 Removal shall mean removal from site and safe disposal in a legal manner.
 - .13 All additional items for demolitions and removal as per Drawings.

1.2 **REFERENCES**

- .1 CSA S350-M, Code of Practice for Safety in Demolition of Structures.

1.3 **SUBMITTALS**

- .1 Where required by Authorities having jurisdiction, submit a Fire Plan to local fire department for review and approval.
- .2 Submit shop drawings, diagrams and details in accordance with Section 01 30 00.
- .3 30 calendar days prior to start of demolition and removals work, submit for review, drawings, diagrams or details showing sequence of disassembly work and shoring of supporting structures in accordance with authorities having jurisdiction.

- .4 Submit for approval, a plan showing impacts, interruptions and delays to Owners operations.
- .5 Have submissions signed and sealed by Professional Engineer licensed in Province of Ontario.
- .6 Submit to Consultant, details of where rubble, debris and other materials are to be disposed or reused. Include each disposal/reuse site location, operator's name and business address, type of license under which site operates, and criteria used by site to assess suitability of rubble, debris and other materials for disposal.
- .7 Give notice to Utility Authorities controlling services and appurtenances which will be affected by demolition work.

1.4 **QUALITY ASSURANCE**

- .1 Prepare waste audits, waste reduction workplans, source separation programs and recycling programs as required by jurisdictional authorities and update programs and implement such programs as required.
- .2 Perform the work of this section in accordance with the 'Environmental Protection Act' including Ontario Regulation 102 and the 'Environmental Assessment Act' including Ontario Regulation 103.
- .3 Conform to Fire Code, Regulation under the Fire Marshals Act.
- .4 The demolition contractor must engage a registered professional engineer who holds a certificate of authorization and an appropriate level of liability insurance to prepare demolition procedures.
- .5 As part of the contract requirements, the engineer for the demolition contractor should be required to sign the general review commitment required by city building departments.

1.5 **SITE CONDITIONS**

- .1 Interruptions to Owners operations will not be permitted.
- .2 Perform operations, machine and equipment movements, deliveries and removals at time or times that will permit uninterrupted operations in and around structures, including parking, deliveries, and Site access and egress.
- .3 Take over structures to be demolished based on condition on date that Tenders close.

2 Products

2.1 **MATERIALS**

- .1 All materials requiring removal shall become the Contractor's property and shall be removed and disposed of from the site, as the work progresses, unless indicated otherwise.
- .2 Temporary Protection:
 - .1 Provide temporary hoarding consisting of 16 mm plywood sheathing, wood studs and 16 mm plywood sheathing with lock-able access door in areas shown on Drawing.
 - .2 Hoarding are to remain in place and secure.
- .3 Salvaged material:
 - .1 Salvage and stockpile Products, materials, and equipment as specified herein, indicated on Site or indicated on drawings.
 - .2 Coordinate items to be salvaged with Consultant.
 - .3 Salvaged materials shall not be chipped, cracked, split, stained or damaged.
 - .4 Store items off of moist surfaces.

3 Execution

3.1 **GENERAL**

- .1 Clean up rubble and debris, resulting from work promptly and dispose at end of day or place in waste disposal bins. Empty bins on regular basis.
- .2 Stockpiling of rubble, debris, and surplus Products on Site will not be permitted.
- .3 Remove, handle and transport Products indicated to be salvaged and stored for future use. Transport Products to storage area(s) designated by Consultant. Perform work to prevent any damage to Products during removal and in storage. Products damaged during removal, will be inspected by Consultant. Consultant will determine extent of damage and accept or refuse Products.
- .4 List and description of items to be removed and stored or reused:
 - .1 Items as indicated on the drawings or by the Consultant.
- .5 Tag and log all items to be salvaged to the satisfaction of the Consultant. Ensure identification tags do not damage items to be salvaged and are non-permanent, removable and durable.
- .6 Communicate Dust Control Plan procedures to all appropriate personnel on site and their head offices and due diligence measures to be maintained to control all fugitive emissions.

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

3.2 **EXAMINATION**

- .1 Verify condition and dimensions of previously installed work upon which this Section depends. Report defects to Consultant. Commencement of work of this Section means acceptance of existing conditions.

3.3 **PRESERVATION OF REFERENCES**

- .1 Record location and designation of survey markers and monuments located within demolition area, prior to removal. Store and restore markers and monuments upon completion of Work or relocate as directed by Consultant.

3.4 **PROTECTION**

- .1 Prevent movement or damage of adjacent structures, services, walks, paving, landscaping and parts of existing structure to remain. Supply and install bracing, and shoring as required. Make good damage caused by demolition to acceptance of Consultant.
- .2 Protect adjacent structures and property against damage which might occur from falling debris or other causes. Repair or replace damage caused from work of this Section to acceptance of Consultant.
- .3 Do not interfere with use of adjacent structures and Work areas. Maintain free, safe passage to and from adjacent structures and Work areas.
- .4 Take precautions to support affected structures. If safety of structure being demolished, adjacent structures or services are endangered, cease demolition operations and take necessary action to support endangered item. Immediately inform Consultant. Do not resume demolition until reasons for endangering have been determined and corrected and action taken to prevent further endangering.
- .5 If movement or settlement occurs, install additional bracing and shoring as necessary and make good damage to acceptance of Consultant.
- .6 Hang tarpaulins where debris and other materials are lowered. Build in around openings with wood and plywood at locations used for removal of debris and materials.
- .7 Prevent debris from blocking surface drainage system, mechanical, and electrical systems which are required to remain in operation.
- .8 Pay particular attention to prevention of fire and elimination of fire hazards which would endanger Work or adjacent structures and premises.

- .9 Supply and install adequate protection for materials to be re-used, set on ground and prevent moisture pick-up. Cover stockpiles of materials with tarpaulins.
- .10 Close off access to areas where demolition is proceeding by barricades and post warning signs.
- .11 Supply, install and maintain legal and necessary barricades, guards, railings, lights, warning signs, security personnel and other safety measures, and fully protect persons and property.
- .12 Dust partitions:
 - .1 Prior to demolition work proceeding in existing structures, temporarily enclose Work areas, access and supply and install dustproof partitions. Design partitions to prevent dust and dirt infiltration into adjoining areas, and prevent ingress of water.
 - .2 Prevent dust, dirt and water from demolition operations entering operational areas.
 - .3 Adjust and relocate partitions as required for various operations of work.
 - .4 Upon completion of work, remove and dispose of partitions from Site.
- .13 Dust protection:
 - .1 Perform dust control procedures in accordance with approved Dust Control Plan and work of this Section.
 - .2 Clean water to be applied to hard and soft surfaces and on open excavation faces on Site daily to eliminate dust.
 - .3 Roadways and sidewalks to be cleaned daily or as required.
 - .4 A designated truck loading area on granular material or existing asphalt to be used to mitigate tracking of potentially contaminated soil and demolition debris off Site. Contaminated loading points to be cleaned or re-established.
 - .5 Loaded vehicles leaving Site to be cleaned of loose soil and debris with power washing or alternative method.
 - .6 Trucks loaded with indigenous soil or demolition debris to be covered by tarps or attached screens.
- .14 Blasting is not permitted.

3.5 **PREPARATION**

- .1 Disconnect and/or re-route electrical data, communication and telephone service lines entering structures to be demolished. Post warning signs on electrical lines and equipment which is required to remain energized.
- .2 Disconnect and cap designated mechanical services:
 - .1 Natural gas supply lines: As indicated on drawings and as required for alteration work, to be removed by qualified workers in accordance with gas company instructions.
 - .2 Sewer and water lines: Remove and dispose of as indicated on Contract Drawings and as required for alteration work.

- .3 Disassemble and remove mechanical equipment, ductwork and piping complete with supports and associated components.
- .4 Do not disrupt active or energized utilities designated to remain undisturbed.
- .5 Perform rodent and vermin control to comply with health regulations.

3.6 **DEMOLITION**

- .1 Perform demolition with extreme care. Confine effects of demolition to those parts which are to be demolished.
- .2 Perform work and prevent inconvenience to persons outside those parts which are to be demolished.
- .3 Carry out demolition in accordance with the requirements of CSA S350-M.
- .4 Demolish parts of structure to permit remedial work as indicated.
- .5 Demolition shall proceed safely in systematic manner from roof to grade and as necessary to accommodate remedial work indicated. 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.
- .6 Do not overload floor or wall with accumulations of material or debris or by other loads.
- .7 Perform work to minimize dusting. Keep work area wetted down with fog sprays to prevent dust and dirt rising. Supply and install temporary water lines and connections that may be required. Upon completion, remove installed temporary water lines. Use covered chutes, water down.
- .8 Do not sell or burn materials on Site.
- .9 Remove existing equipment, services, and obstacles where required for refinishing or making good of existing surfaces, and replace as Work progresses.
- .10 At end of day's work, leave Work in safe condition with no part in danger of toppling or falling.
- .11 Drainage and sewer system protection:
 - .1 Ensure that no dust, debris or slurry enters drainage and sewer system on Site.
 - .2 Remove and dispose of debris and slurry promptly from Site.
 - .3 Comply with City of Whitby Sewer Use By-Law.

- .12 Concrete:
 - .1 Demolish concrete by methods which avoid impact loads on items which are not to be demolished.
 - .2 Where only part or parts of a concrete floor, wall, roof, foundation or other items are to be demolished, use saw cuts to isolate areas which are to be demolished except where existing reinforcing steel is to be left in place. Prior to such isolating, install suitable support to prevent premature movement of area(s) being isolated and undesirable transfer of loads as cutting progresses. If necessary remove area(s) to be demolished by successively isolating small sections.
 - .3 Where reinforcing steel is to be left in place, use saw cuts from surface of concrete around perimeter(s) of area(s) to be demolished, chip concrete without damaging reinforcing steel. Retouch damaged epoxy coating of existing reinforcing steel.

- .13 Masonry:
 - .1 Demolish block or brick walls in small sections of not more than 2 m². Do not permit masonry to fall in mass from one level to another.
 - .2 Where only part(s) of a wall is to be demolished, install adequate support for adjacent part(s).
 - .3 After removal of masonry walls, grind smooth floors ready for new floor finish.

- .14 Steel: Where only part or parts of structure is to be demolished, dismantle and maintain structure stable. Do not place excessive loads on components. Install adequate temporary guys and supports to ensure stability and to prevent excessive loading. Support each component being disconnected from structure, and lower, do not drop, component after it is disconnected.

- .15 Cut openings through existing walls, partitions, roofs and floors. Establish exact location of steel reinforcing in existing concrete slabs or walls before cutting. Be responsible for damage to existing steel reinforcing and be liable for structural failure. Make good surfaces disturbed with materials to match existing..

- 16. Where doors are scheduled to be removed, include removal of door frames and door hardware.

- 17. Remove interior partitions, fittings, fixtures and accessories as indicated on drawings. Partitions and walls shall be removed full height to structure above.

- 18. Remove interior finishes, such as ceiling and floor finishes, where new finishes are indicated on Contract Drawings.
 - 1. Removal of existing ceilings shall include complete removal including bulkheads and suspension system.
 - 2. Removal of adhesive applied finishes shall include complete removal to substrate including adhesive. Take adequate care to prevent damage to substrate.
 - 3. Remove existing floor finishes, include mortar bed, underlayment or other cleavage membranes, underpad, base, floor moulding and transition strips.

- .19 Remove existing floor finishes, include mortar bed, underlayment or other cleavage membranes, underpad, base, floor moulding and transition strips.
- .20 Where floor finishes are scheduled to be removed, include stripping of all adhesive, underlayment or other cleavage membranes and leave sub-base, flush, smooth and level suitable for new floor finish.
- .21 Where acoustic ceiling tiles are indicated for removal and subsequent reinstallation, the tile are to be removed and stored on site in a dry and safe location approved with the Consultant and Owner. The suspension system and framing is to be removed only as required for work above the ceiling, and subsequently re-installed with the ceiling tiles.
- 22. Demolish all other items indicated or required.

3.7 **RECYCLING**

- .1 Whenever possible, all materials shall be recycled. Pay all costs for this work.
- .2 Deliver to nearest appropriate recycling depot all materials accepted for recycling by Authorities having jurisdiction over the Place of Work, including but not limited to cardboard, paper, plastic, aluminum, steel, and glass.
- .3 Deliver to nearest appropriate depot all scrap and excess gypsum wallboard for recycling of this material.

3.8 **DISPOSAL OF MATERIALS**

- .1 Remove from Site, rubble, debris, and other materials that can not be recycled resulting from demolition and removals work in accordance with Authorities having Jurisdiction, except where specified or indicated on Contract Drawings to be reused.
- .2 Conform to requirements of municipality's Works Department regarding disposal of waste materials.
- .3 Materials prohibited from municipality waste management facilities shall be removed from Site and dispose of at recycling companies specializing in recyclable materials.

3.9 **RESTORATION**

- .1 Where demolition removed a structure or installation, restore area in accordance with Authorities having Jurisdiction.

END OF SECTION

1 General

1.1 **SECTION INCLUDES**

- .1 Labour, Products, equipment and services necessary for concrete block masonry work in accordance with the Contract Documents.

1.2 **REFERENCES**

- .1 ASTM A1064/A1064-M, Standard Specification for Carbon-Steel Wire and Welded Wire Reinforcement, Plain and Deformed, for Concrete.
- .2 ASTM C207, Specification for Hydrated Lime for Masonry Purposes.
- .3 CSA A165 Series, CSA Standards on Concrete Masonry Units.
- .4 CSA A179, Mortar and Grout for Unit Masonry.
- .5 CSA A370, Connectors for Masonry.
- .6 CSA A371, Masonry Construction for Buildings.
- .7 CAN/CSA A3000, Cementitious Materials Compendium.
- .8 CAN/CSA G30.18-M, Billet-Steel Bars for Concrete Reinforcement.
- .9 CSA S304, Design of Masonry Structures.

1.3 **SUBMITTALS**

- .1 Shop drawings:
 - .1 Submit shop drawings in accordance with Section 01 30 00 indicating.
 - .2 Wall sections and details, reinforcing and anchors, special detailing, patterning and locations of control joints.
- .2 Samples:
 - .1 Submit samples in accordance with Section 01 30 00:
 - .2 Submit samples of each type and colour of masonry unit used prior to placing order.
 - .3 Submit samples of masonry anchors, and ties.
 - .4 Submit 250 x 200 mm samples of dampproof course.
- .3 Quality control submittals:
 - .1 Submit manufacturer's certificates stating that materials supplied are in accordance with this Specification.

1.4 **QUALITY ASSURANCE**

- .1 Provide plain and reinforced masonry in accordance with CSA A370, CSA A371, and CSA S304.

1.5 **DELIVERY, STORAGE, AND HANDLING**

- .1 Deliver, store and handle Products in accordance with the Conditions of the Contract and as specified herein.
- .2 Remove unacceptable materials from Site and replace to acceptance of Consultant. Store materials off ground protected from wetting by rain, snow or ground water, or inter-mixture with earth or other materials. Store metal ties and reinforcement to prevent corrosion.
- .3 Do not concentrate storage of materials on any part of structure beyond design load, take particular care not to overload unsupported portions of structure which may have not attained their full design strength.
- .4 Comply with CAN3-A371. Do not use salt or calcium-chloride to remove ice from masonry surfaces.
- .5 Deliver mortar materials in original unbroken and undamaged packages with the maker's name and brand distinctly marked thereon. Prevent damage to units.
- .6 Keep masonry materials free from ice and frost. Keep units protected from concrete, mortar and other materials which could cause staining.

2 Products

2.1 **MASONRY UNITS**

- .1 Concrete block units: Lightweight units for use at all fire rated applications and block exposed to view, CSA A165 Series, sizes indicated on Contract Drawing, classifications as follows:
 - .1 H/15/D/M.
 - .2 SS/15/D/M.
 - .3 SF/15/D/M.
- .2 Concrete block units: Normalweight units for all non-fire rated applications and where concealed, CSA A165 Series, sizes indicated on Contract Drawing, classifications as follows:
 - .1 H/15/A/M.
 - .2 SS/15/A/M.
 - .3 SF/15/A/M.

- .3 Special shapes: Unless indicated otherwise, supply and install corner returns, bull-nosed or double bull-nosed units for exposed and external corners, bond beams, sash blocks for control joints, solid block where noted, concrete block lintels over openings in concrete block walls and any additional special shapes as indicated.
- .4 Obtain each masonry unit type from same manufacturer. Supply and install units of uniform texture and colour for each kind required.
- .5 Supply masonry units with exposed surfaces free of cracks, chips, blemishes, and broken corners.

2.2 **ACCESSORIES**

- .1 Wire reinforcement: CAN3-A370, CAN3 A371, and ASTM A1064/A1064-M, hot dip galvanized. This specification is based on products manufactured by Blok-Lok Limited. Products by Dur-O-Wal Ltd. and Fero Corporation are approved alternatives:
 - .1 Single wythe: Truss type; 'Blok-Trus BL30'.
 - .2 Double wythe: Truss type; 'Blok-Trus BL32'.
- .2 Connectors: CSA A370 and CSA S304.
- .3 Reinforcing steel: CSA G30.18-M, Grade 400, refer to Contract Drawings for number, size, and location.
- .4 Loose steel lintels and lateral support angles: Supplied as part of work of Section 05 50 00.
- .5 Compressible filler: 75 x 6 mm thick preformed, polyurethane foam; 25V by Emseal Joint Systems Ltd.
- .6 Control joint filler: Prefabricated extruded rubber joint to suit wall thickness; RS Series Rubber Control Joint by Blok-Lok or approved alternative.

2.3 **MORTAR MATERIALS**

- .1 Loadbearing masonry: CSA A179, Type S, proportion method.
- .2 Interior non-loadbearing masonry: CSA A179, Type N, proportion method.
- .3 Cement: CAN/CSA A3000, Cementitious Materials Compendium, Type GU.
- .4 Hydrated lime: ASTM C207, Type S.
- .5 Masonry aggregate: CSA A179.
- .6 Water: Clean potable, free from deleterious elements and free from salts that can cause efflorescence.

- .7 Concrete fill and grout: Minimum 12.5 Mpa concrete in accordance with CSA A179.

3 Execution

3.1 **EXAMINATION**

- .1 Verify condition and dimensions of previously installed Work upon which this Section depends. Report defects to Consultant. Commencement of work of this Section means acceptance of existing conditions.

3.2 **PROTECTION**

- .1 Supply and install temporary waterproof, non-staining coverings, secured against displacement, to extend over walls and down sides to protect masonry work from snow and wind driven rain, and from drying too quickly, until masonry work is completed and protected by flashings or other permanent construction.
- .2 Supply and install non-staining, protective coverings on horizontal and vertical surfaces to protect work of this Section from damage, staining, marking, and mortar droppings.

3.3 **WORKMANSHIP**

- .1 Perform masonry work in accordance with CAN3 A371 and as indicated .
- .2 Supply and install masonry work plumb, level and true to line, with vertical joints in alignment and horizontal courses level, uniform, and straight.
- .3 Install masonry work to a plane flatness and exposed end tolerance of 3 mm in 2400 mm.
- .4 Variation in Alignment from Unit to Adjacent Unit: 1.5 mm maximum.
- .5 Variation of Mortar Joint Thickness: 3 mm every metre.

3.4 **MASONRY - GENERAL INSTALLATION**

- .1 Construct masonry work as required by jurisdictional authorities.
- .2 Before commencing masonry work, verify required limitations for wall heights, wall thicknesses, openings, bond, anchorage, lateral support, and compressive strengths of masonry units and mortars.
- .3 Construct masonry fire protection and fire separations of the thickness indicated on Drawings for the fire resistant ratings as noted on Drawings, and conforming to the Fire-Performance Ratings, Appendix 'D' to the National Building Code of Canada.

- .4 Fire Separations and Fire Separations with Fire Resistance Ratings: Construct walls tightly to construction above and at perimeter, and without openings or voids. Do not reduce the thickness of walls to less than the thickness indicated on the Drawings or for the required fire resistance rating where required.
- .5 Do not butter corner units, throw mortar droppings into joints, or excessively furrow bed joints. Do not shift or tap units after mortar has taken initial set. If adjustment is necessary after mortar has started to set, remove and replace with fresh mortar.
- .6 Do not use admixtures without Consultant's written acceptance.
- .7 Tool mortar joints slightly concave with non-staining tools unless indicated otherwise. Strike joints flush in non exposed areas or where shown on Contract Drawings. Use sufficient force to press mortar tight against masonry units on both sides of joints. Remove excess, remaining mortar material and burrs.
- .8 Install masonry walls 25 mm clear of underside of steel building frames, roof or floor deck. Install masonry with a 19 mm space beneath shelf angles and install compressible filler.
- .9 Cut masonry units with a wet saw to obtain straight, clean, even, unchipped edges. Cut units as required to fit adjoining work neatly or for flush mounted electrical outlets, grilles, pipes, conduit, leaving 3 mm maximum clearance. Use full-size units without cutting wherever possible.
- .10 Reinforce block walls with continuous wire reinforcement in every second block course. Supply and install prefabricated L and T sections. Cut, bend and lap reinforcing units as per manufacturer's printed directions for continuity at returns, offsets, pipe enclosures, and other special conditions. Bending of masonry reinforcement is not permitted.
- .11 Reinforce masonry walls with reinforcing steel as indicated on Drawings. Vertical reinforcing shall be fully grouted in masonry cores with grout.
- .12 At openings in block walls install extra reinforcement, so that first and second courses above and below openings are reinforced. Extend extra reinforcement 600 mm beyond opening in each direction.
- .13 Reinforce joint corners and intersections with strap anchors 400 mm o.c.
- .14 Do not place reinforcement across masonry wythes at control joints.
- .15 Install masonry with 10 mm thick joints unless indicated otherwise. Make vertical and horizontal joints equal and of uniform thickness.
- .16 Build control joints in masonry walls at intervals and in locations shown. Form joints for block walls using sash block units in accordance with details shown. Fill chase and joint with joint filler full height of control joints. Leave a depth of 13 mm for sealing unless otherwise shown.

- .17 Install control joints in masonry walls where indicated on drawings and at projections and changes in direction. Where control joints have not been indicated provide joints at 6100 mm o.c. for exterior walls and 9150 mm o.c. for interior walls.
- .18 Supply and install solid block or metal lath under block, and fill block cells solid for lintel bearing and as required to secure built-in anchor bolts and/or anchors shown.
- .19 Do not tooth intersections of walls except as otherwise indicated.
- .20 Coordinate installation of masonry with installation of air barrier and vapour retarder to ensure continuity of these systems.

3.5 **MORTAR MIXING**

- .1 Thoroughly mix mortar ingredients in proper quantities needed for immediate use to requirements of CSA A179.
- .2 Measure and batch mortar materials either by volume or weight, to accurately control and maintain proportions. Do not measure materials by shovel.
- .3 Mix mortar with maximum amount of water consistent with workability for maximum tensile bond strength within capacity of mortar.
- .4 Do not use mortar which has begun to set. Use mortar within 2 hours after initial mixing. Re-temper mortar during 2 hour period only as required to restore workability.
- .5 Add admixtures to requirements of manufacturer's instructions.
- .6 Provide uniformity of mix.

3.6 **BLOCK**

- .1 Lay blocks in running bond except as indicated otherwise. Align block webs vertically and install thicker ends of face shells up.
- .2 Install a full bed of mortar for first courses of masonry, for masonry units 100 mm thick and less, and between solid units. For remaining courses bed face shells, including vertical end joints, fully in mortar.
- .3 Install special shaped and sized concrete block units as indicated and as required for a complete and coordinated assembly and to minimize cut units.
- .4 Supply and install two courses of solid block beneath lintel bearing.
- .5 Stagger end joints in every course. Align joints plumb over each other in every other course.

- .6 Bond intersecting block walls in alternate courses. Where block work abuts concrete, anchor each block course to concrete.

3.7 **LINTELS**

- .1 Install concrete block lintels over openings in masonry except where steel lintels are indicated.
- .2 Set lintels with minimum of 200 mm uniformly distributed bearing at each end.
- .3 Install reinforcing steel and concrete fill in block lintels.
- .4 Install loose steel lintels, as indicated in Contract Drawings. Centre over opening width.

3.8 **LATERAL SUPPORT ANGLES**

- .1 Where non load bearing unit masonry partitions meet structural elements at top of partitions, provide lateral supports as required by the Ontario Building Code and in accordance with Structural details. In areas where ceilings are scheduled, use 150 mm lengths of steel angle located each side of partition at 1200 mm and staggered.

3.9 **BUILT-IN ITEMS**

- .1 Coordinate and locate build-in items required to be built into masonry or supplied under work of other Sections including hollow metal doors, windows, lintels, sleeves, inserts, etc. Build-in items to present a neat, rigid, true and plumb installation.
- .2 Build wall openings, slots, and recesses required for ducts, grilles, pipes and other items.
- .3 Coordinate installation of conduit, outlet boxes and other mechanical and electrical built-ins with work of Divisions 21, 22, 23 and 26.
- .4 Prevent displacement of built-in items during construction. Check plumb, location and alignment frequently, as Work progresses.
- .5 Brace door jambs to maintain plumbness. Set anchors between metal frames and masonry and fill voids between hollow metal frames and masonry walls with mortar.

3.10 **INSTALLATION TOLERANCES:**

- .1 Planes true to within 3 mm under 3 m straightedge.
- .2 Plumb within 6 mm in 3 m, or in 6 mm in 6 m at external corners, expansion joints, or other conspicuous lines.
- .3 Level within 6 mm in any bay or 6 m maximum distance, and 12 mm in 12 m or more.

- .4 Located from position shown, and from related position of columns, walls, and partitions within 12 mm in any bay or 6 m maximum distance, and 19 mm in 12 m or more.
- .5 Opening sizes within 6 mm of designated dimension.
- .6 Column and wall cross-section dimensions within minus 6 mm and plus 12 mm.
- .7 With joints to dimensions indicated, but in no case greater than 12 mm.

3.11 **REPAIR AND POINTING**

- .1 Remove and replace masonry units which are loose, chipped, broken, cracked, marked, stained, discoloured, or otherwise damaged. Supply and install new units to match adjoining units and install in fresh mortar, and point to eliminate evidence of replacement.
- .2 During tooling of joints, enlarge any cracks, holes, or other defects, point and completely fill with mortar.
- .3 Point-up joints including corners, openings and adjacent Work for a neat, uniform appearance, properly prepared for application of sealant compounds.

3.12 **CLEANING**

- .1 Obtain and follow unit masonry manufacturer's written instructions for cleaning of masonry.
- .2 Clean exposed, masonry surfaces, removing excess mortar as work progresses. Allow mortar droppings to partially dry then dry brush with a stiff fibre brush.

END OF SECTION

1 General

1.1 **SECTION INCLUDES**

.1 Design, labour, Products, equipment and services necessary for the miscellaneous and metal fabrication work in accordance with the Contract Documents.

1.2 **REFERENCES**

- .1 ASTM A123, Specification for Zinc (Hot Dip Galvanized) Coatings on Iron & Steel Products.
- .2 ASTM A153, Specification for Zinc Coating (Hot-Dip) on Iron and Steel Hardware.
- .3 ASTM A307, Specification for Carbon Steel Bolts and Studs, 60,000 psi Tensile Strength.
- .4 ASTM A653/A653M, Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvanealed) by the Hot-Dip Process.
- .5 CISC/CPMA 1.73a, A Quick-Drying One-Coat Paint for Use on Structural Steel.
- .6 CAN/CSA-G40.20/G40.21-M, General Requirements for Rolled or Welded Structural Quality Steel/ Structural Quality Steels.
- .7 CAN/CSA S16.1-M, Limit States Design of Steel Structures.
- .8 CSA S136.1-M, Commentary on CAN/CSA S136-M, Cold Formed Steel Structural Members.
- .9 CSA W47.1, Certification of Companies for Fusion Welding of Steel Structures.
- .10 CSA W48, Filler Metal and Allied Materials for Metal Arc Welding.
- .11 CSA W59-M, Welded Steel Construction (Metal Arc Welding).
- .12 CAN/CSA W117.2-M, Safety in Welding, Cutting and Allied Processes.
- .13 CAN/CGSB 1.40-M, Primer, Structural Steel, Oil Alkyd Type.
- .14 CGSB 85-GP-16M, Painting Galvanized Steel.
- .15 NAAMM, The National Association of Architectural Metal Manufacturers.
- .16 Steel Structures Painting Council (SSPC), Steel Structures Painting Manual, Vol. 2.

1.3 DESIGN REQUIREMENTS

- .1 Design details and connections, where not shown on Drawings, in accordance with CAN/CSA-S16.1 and CSA S136.1.

1.4 SUBMITTALS

- .1 Shop drawings:
 - .1 Submit shop drawings for fabrication and erection of miscellaneous and metal items in accordance with Section 01 30 00 indicating:
 - .1 Materials, core thicknesses, class of finish (AMP 555), connections, joints, method of anchorage, number of anchors, supports, reinforcement, details, and accessories.
 - .2 Handrails and guards, ladders, gas meter enclosures, storage enclosures, exterior signage supports, and metal fabrication items.
 - .3 Ensure shop drawings are of one uniform size and based on field measurements.

1.5 QUALITY ASSURANCE

- .1 Retain a Professional Engineer, licensed in the Province of Ontario, with experience in work of comparable complexity and scope, to perform the following services as part of the work of this Section:
 - .1 Design handrails and railings, exterior signage supports, and metal fabrication items that are required to resist live, dead, lateral, wind, or seismic loads.
 - .2 Review, stamp, date and sign shop drawings.
- .2 Workmanship: Fabricate work of this Section to meet the required class of workmanship indicated below in accordance with AMP 555, Section 8.
 - .1 Class 1: for use on direct exposed to view fabricated items:
 - .1 Exposed surfaces are finished smooth with pits, mill marks, nicks, burrs, sharp edges, and scratches filled or ground off. Defects should not show when painted, polished, or finished.
 - .2 Welds should be concealed where possible. Exposed welds are ground to small radius with uniform sized cove unless otherwise noted.
 - .3 Distortions should not be visible to the eye.
 - .4 Exposed joints are fitted to a hairline finish.
- .3 Execute welding by firms certified in accordance with CSA W47.1 Division 1 or 2.1. Ensure welding operators are licensed per CSA W47.1 for types of welding required by Work.

2 Products

2.1 **MATERIALS**

.1 General:

- .1 All materials under work of this Section, including but not limited to, primers and paints are to have low VOC content limits.
 - .2 Unless detailed or specified herein, standard products will be acceptable if construction details and installation meet intent of Drawings and Specifications.
 - .3 Include all materials, products, accessories, and supplementary parts necessary to complete assembly and installation of work of this Section.
 - .4 Incorporate only metals that are free from defects which impair strength or durability, or which are visible. Install only new metals of best quality, and free from rust or waves and buckles, and that are clean, straight, and with sharp defined profiles.
- .2 Structural shapes, plates, and similar items: CAN/CSA-G40.20/G40.21-M, Grade 350W. Hollow structural sections: CAN/CSA-G40.20/G40.21-M, Grade 350W, Class H.
 - .3 Galvanized sheet steel: ASTM A653/A653M Grade A, Z275 Commercial Quality zinc coating, size and shape as shown.
 - .4 Welding materials: CSA W48 and CSA W59-M.
 - .5 Fasteners: Conforming to ASTM A307, Grade A, in areas not exposed to view, use unfinished bolts with hexagon heads and nuts. In areas exposed to view, use bolts, nuts, washers, rivets, lock washers, anchor bolts, machine screws and machine bolts Z275 zinc coated in accordance with ASTM A653/A653M. Supply bolts of lengths required to suit thickness of material being joined, but not projecting more than 6 mm beyond nut, without the use of washers.
 - .6 Primer paint: CAN/CGSB-1.40-M or CPMA 1.73a.
 - .7 Galvanized primer paint: Inorganic zinc rich primer. For use on galvanized fabrications where touch up is to remain unpainted in finished work; Carbozinc 11WB by Carboline Company, Catha-Coat 305 by Devoe Coatings or Zinc Clad XI by Sherwin Williams.
 - .8 Drilled inserts: Mega by ITW Construction Products or HSL by Hilti Inc. heavy-duty anchors, sizes as shown.
 - .9 Adhesive anchor system: 'HIT HY 200 Injectable Mortar with Hilti HAS Stainless Steel Anchor Rod System' by Hilti Ltd. or approved alternative by ITW Construction Products, complete with all components required for a complete installation.

2.2 **FABRICATION**

- .1 Verify dimensions of existing Work before commencing fabrications and report any discrepancies to the Consultant.
- .2 Fit and assemble work in shop where possible. Execute work in accordance with details and reviewed shop drawings.
- .3 Use self-tapping shake-proof screws on items requiring assembly by screws or as indicated. Use screws for interior metal work. Use welded connections for exterior metal work unless otherwise found acceptable by the Consultant.
- .4 Ensure exposed welds are continuous for length of each joint. File or grind exposed welds smooth and flush. Seal exterior steel fabrications against corrosion in accordance with CAN/CSA S16.1-M.
- .5 Execute shop welding to requirements specified .
- .6 Carefully make and fit details. Take special care with exposed finished work to produce a neat and correct appearance to the Consultant's acceptance.
- .7 Assemble members without twists or open joints.
- .8 Correctly size holes for connecting work of other trades where such can be determined prior to fabrication. Where possible, show holes on shop drawings. Place holes not to cause appreciable reduction in strength of member.
- .9 Draw mechanical joints to hairline tightness and seal countersunk screw and access holes for locking screws with metal filler where these occur on exposed surfaces.

2.3 **FABRICATED ITEMS**

- .1 Refer to Drawings for details of metal fabrication work and related items not specifically listed in this Section.
- .2 Where work is required to be built into work of other Sections supply such members to respective Sections.
- .3 Provide metal fabrication items indicated below and items not indicated to be supplied under other Sections. The following items includes miscellaneous and metal fabrication including but not limited to the items listed below.
- .4 Lintels: Fabricated from CAN/CSA-G40.20/G40.21-M, Grade 350W, size and location as shown, width to be not less than 25 mm less than width of wall and extend 200 mm beyond opening at each end. Unless otherwise shown, fabricate lintels in block walls of steel sections.

- .5 Masonry lateral support angles:
 - .1 Supply only, to Section 04 22 00 for installation, all horizontal lateral support anchors at top of non-load-bearing masonry walls.
 - .2 Refer to Structural Drawings for size and spacing of required support anchors. Provide drilled holes as required for anchorage.
 - .3 Galvanized for all exterior wall and unheated and high humidity locations.
- .6 Shelf Angles: Of size indicated on Drawings and as specified in structural steel specifications, with adjustable inserts for vertical adjustment and slotted holes for horizontal; galvanized.
- .7 Channel door frames: Structural channel sections, selected for trueness of web and flange, with joints welded and ground smooth. Supply bar stop and bent bar anchors for anchorage to masonry or concrete as required. Fit frames with temporary spreaders to prevent frame from springing out of shape.
- .8 Miscellaneous steel brackets, supports and angles:
 - .1 Supply and install or supply for installation by trades responsible, all loose steel brackets, supports and angles where indicated, except where such brackets, supports and angles are specified under work of other Sections. Drill for countersunk screws, expansion anchors and anchor bolts.
 - .2 Unless otherwise specified, prime paint for interior installation; galvanized finish for exterior installation.

2.4 **ANCHORS AND FASTENING**

- .1 Use weld studs of size not larger than 10 mm for attaching miscellaneous materials and equipment to building steel. If weight of item requires larger fasteners use clips or brackets and secure by welding or through bolting.
- .2 Use self drilling expansion type concrete anchors for attaching to masonry and concrete
- .3 Do not secure items to steel deck.
- .4 Use steel beam clamps of two bolt design to transmit load to beam web. Do not use C and I clamps.
- .5 Mount vertical access ladders in accordance with OBC.

2.5 **WELDING**

- .1 Perform welding by electric arc process.
- .2 Execute welding to avoid damage or distortion to Work. Execute welding in accordance with following standards:
 - .1 CSA W48 - for Electrodes. If rods are used, only coated rods are allowed.

- .2 CSA W59-M and CSA W59S1-M for design of connections and workmanship.
- .3 CAN/CSA W117.2-M - for safety.

- .3 Thoroughly clean welded joints and expose steel for a sufficient distance to perform welding operations. Finish welds smooth. Supply continuous and ground welds which will be exposed to view and finish paint.
- .4 Test welds for conformance and remove work not meeting specified standards and replace to Consultant's acceptance.

2.6 **SHOP PAINTING**

- .1 Clean steel to SSPC SP6 and remove loose mill scale, weld flux and splatter.
- .2 Shop prime steel with one coat of primer paint to dry film thickness of 0.07 mm. Paint on dry surfaces, free from rust, scale, grease. Do not paint when temperature is lower than 7 deg C. Paint items under cover and leave under cover until primer is dry. Follow paint manufacturer's recommendations regarding application methods, equipment, temperature, and humidity conditions.
- .3 Shop prime galvanized steel in accordance with CGSB 85-GP-16M.
- .4 Clean but do not paint surfaces being welded in field.
- .5 Do not paint surfaces embedded in concrete, but clean as if they were to be primed.
- .6 Do not prime steel to be fireproofed or to receive intumescent paint coating.
- .7 Do not prime machine finished surfaces, but apply an effective anti-rust compound.
- .8 Take precautions to avoid damage to adjacent surfaces.

2.7 **HOT DIP GALVANIZING**

- .1 After fabrication, hot dip galvanize specific miscellaneous steel items as indicated. After galvanizing, plug relief vents air tight with appropriate aluminum plugs as suitable and required for intended metal fabricated item. Straighten shapes and assemblies true to line and plane after galvanizing. Repair damaged galvanized surfaces with zinc rich primer in accordance with manufacturer's printed directions.

- .2 Hot-dip galvanize members in accordance with requirements of the following ASTM, with minimum coating weights or thicknesses as follows:
 - .1 Rolled, pressed and forged steel shapes, plates, bars and strips: ASTM A123; average weight of zinc coating per square/metre of actual surface, for 4.8 mm and less thickness members 600 g/m² for 6 mm and heavier members 640 g/m².
 - .2 Iron and steel hardware: ASTM A153; minimum weight of zinc coating, in ounces per square foot of surface, in accordance with ASTM A153, Table 1 for the various classes of materials used in the Work.

- 3 Execution

- 3.1 **EXAMINATION**
 - .1 Examine previously installed Work, upon which this Section depends, verify dimensions and condition of existing Work, and coordinate repairs, alterations, and rectification if necessary. Commencement of work of this Section is deemed to signify acceptance of existing, prior conditions.
 - .2 Obtain Consultant's written approval prior to field cutting or altering of structural members.

- 3.2 **ERECTION**
 - .1 Install metal fabrications in accordance with reviewed shop drawings and manufacturer's written instructions.
 - .2 Fit joints and intersecting members accurately. Make work in true planes with adequate fastenings. Build and erect work plumb, true, square, straight, level and accurate to sizes detailed, free from distortion or defects detrimental to appearance or performance.
 - .3 Perform drilling of concrete and steel as required to fasten work of this Section.

- 3.3 **TOUCH UPS**
 - .1 Paint bolt heads, washers, nuts, field welds and previously unpainted items. Touch up shop primer damaged during transit and installation, with primer to match shop primer.

END OF SECTION

1 General

1.1 **SECTION INCLUDES**

- .1 Labour, Products, equipment and services necessary for rough carpentry work in accordance with the Contract Documents.

1.2 **REFERENCES**

- .1 ASTM A153, Specification for Zinc Coating (Hot-Dip) on Iron and Steel Hardware.
- .2 ASTM A325, Specification for Bolts Quenched/Tempered Steel Nominal Thread Diameter M16 - M36 For Structural Steel Joints.
- .3 ASTM A653, Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process.
- .4 ASTM F1667, Driven Fasteners: Nails, Spikes and Staples.
- .5 CAN/CSA O80 Series M, Wood Preservation.
- .6 CSA O121-M, Douglas Fir Plywood.
- .7 CAN/CSA O141, Softwood Lumber.
- .8 CAN/ULC-S102, Standard Method of Test for Surface Burning Characteristics of Building Materials and Assemblies.
- .9 NLGA, Standard Grading Rules for Canadian Lumber, National Lumber Grades Authority

1.3 **QUALITY ASSURANCE**

- .1 Lumber identification: Grade stamp of an agency certified by the Canadian Lumber Standards Accreditation Board.
- .2 Plywood identification: Grade mark in accordance with applicable CSA standards.
- .3 Lumber quality: Carefully select individual pieces so that knots and obvious defects will not interfere with placing bolts, proper nailing or making proper connections.
- .4 Moisture Content of wood at time of construction shall be 19% maximum.
- .5 Each piece of pressure treated lumber and fire retardant treated lumber shall be shop marked with the pressure treatment brand and ULC monogram respectively, in accordance with CAN/CSA O80-M.
6. Dimensions of lumber shall conform to dressed sizes specified in CAN/CSA-0141 unless actual dimensions are otherwise indicated or specified.

7. Dimensional references to lumber on Drawings and in Specifications are to nominal sizes unless actual dimensions are indicated. Such actual dimensions shall be dry size.
- .8 Lumber defects: Discard wood with defects which will render a piece unable to serve its intended function. Lumber will be rejected by Consultant for excessive warp, twist, bow, crook, mildew, fungus, or mould, as well as for improper cutting and fitting, whether or not it has been installed.

1.4 **ENVIRONMENTAL REQUIREMENTS**

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

1.5 **PRODUCT DELIVERY, STORAGE AND HANDLING**

- .1 Store materials in a dry area. Cover materials with tarpaulins or polyethylene sheets to prevent moisture absorption and impairment of structural and aesthetic properties. Vent to allow air movement. Tie covering to keep in place.

2 Products

2.1 **MATERIALS**

- .1 General: All materials under work of this Section, including but not limited to, adhesives are to have low VOC content limits.
- .2 Lumber: Softwood, G4S, moisture content 19% or less at time of installation, in accordance with the following:
 - .1 Lumber shall be of same species and grade, equally seasoned and shall be processed and stamped at same mill.
 - .2 CSA O141 and NLGA Standard Grading Rules for Canadian Lumber.
 - .3 Board quality: Construction or better.
 - .4 Dimension quality:
 - .1 Structural joists, planks, and framing: No. 1 Select Structural.
 - .2 Light framing: Construction.
- .3 Plywood: CSA O121-M, G1S unsanded, T & G, standard construction, laminated with waterproof adhesive, exterior grade, Thickness as indicated on drawings.
4. Sheathing: Douglas Fir, CSA 0121-M or CSA O151-M; Select-Tight Face, exterior grade, T & G.
- .5 Surface applied wood preservative: Green coloured copper naphthenate or 5% pentachlorophenol solution, water repellent preservative or same copper based preservative as used for shop impregnation, in accordance with CAN/CSA O80.

- .6 Fire retardant treatment of lumber and plywood: 'Dricon' fire retardant treatment by Biewer Lumber or approved alternative, conforming to CAN/CSA-O80.20 and CAN/CSA-O80.27 respectively, to provide a flame spread rating of 25 or less in accordance with CAN/ULC-S102.
- .7 Rough hardware: Conforming to ASTM F1667; Nails, bolts, screws, anchors, expansion shields, and other fastenings required to frame and fix rough carpentry as follows:
 - .1 Nails, spikes and staples: Spiral type.
 - .2 Bolts: ASTM A325; 12.7 mm diameter minimum with nuts and washers unless noted otherwise.
 - .3 Screws: Countersunk head, full thread type.
 - .4 Proprietary fasteners: Toggle bolts, expansion shields, lag bolts, screws, inorganic fibre plugs, recommended for purpose by manufacturer.
 - .5 Galvanize rough hardware used in fire treated wood and hardware exposed to the atmosphere.
- .8 Fasteners for use in pressure treated wood: Provide hot dipped galvanized fasteners complying to ASTM A153 and connectors in accordance with ASTM A653, Class G185 for non-structural members. Provide type 304 or 316 stainless steel fasteners and connectors for use in Structural, pressure treated wood.

3 Execution

3.1 EXAMINATION

- .1 Verify condition and dimensions of previously installed Work upon which this Section depends. Report defects to Consultant. Commencement of work of this Section means acceptance of existing conditions.

3.2 GENERAL

- .1 Lay out work carefully and to accommodate work of others. Cut and fit accurately: erect in position indicated by Drawings.
- .2 Install rough carpentry to allow for expansion and contraction of the materials.
- .3 Cut work into lengths as long as practicable and with square ends. Align, level, square, plumb, and secure work permanently in place. Brace work temporarily as required. Join work only over solid backing.
- .4 Bore holes true to line and to same size as bolts. Drive bolts into place for snug fit, and use plates or washers for bolthead and nut bearings. Turn up bolts and lag screws tightly when installed, and again just before concealed by other work or at completion of Work.
- .5 Provide anchors, bolts, and inserts required for attachment of the work of this Section, to those performing the work of other Sections and who are responsible for their installation.

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

3.3 MISCELLANEOUS WOODWORK

- .1 Fit and install wood furring, strapping, grounds and blocking. Adequately size, correctly place and conceal members for finishes, fitments and for work under other Sections. Do not assume that Drawings show required work exactly or completely. Anchor wood members securely in place.
- .2 Install rough bucks, nailing strips and linings to rough openings as required for backing for frames and other work.
- .3 Except where steel supports are specifically shown, provide wood blocking and supports in metal stud partitions for fastening of item such as casework and other wall mounted accessories. Have respective trades approve the location of such wood blocking.
- .4 Bolt wood blocking or nailing strips to steel framing.
- .5 Align and plumb faces of furring and blocking to tolerance of 1:600.
- .6 Use fire retardant lumber for blocking/framing in ceiling\ spaces, partitions and bulkheads.

3.4 BACKBOARDS

- .1 Install plywood backboards, primed and painted white on both sides, with fire retardant paint.
- .2 Use minimum 19 mm thick plywood on 19 x 38 mm furring around perimeter and at maximum 300 mm intermediate spacing.

3.5 FASTENERS

- .1 Frame, anchor, fasten, tie and brace members for required strength and rigidity.
- .2 Use hot dipped galvanized fasteners for exterior work and work below grade.
- .3 Countersink bolts and bolt heads as required for clearance of other work.
- .4 Size fasteners to penetrate base member by half of fastener length minimum. Minimize splitting of wood members by staggering nails in direction of grain.
- .5 For plywood use spiral, annular or resin coated nails and staples.

3.6 SURFACE-APPLIED WOOD PRESERVATIVE

- .1 Treat raw surfaces, drilled holes and cut ends of pressure treated wood with 2 coats of wood preservative immediately after cutting.

- .2 Apply preservative by dipping, by brush or by pouring into plugged holes to completely saturate surface.

END OF SECTION

1 General

1.1 **SECTION INCLUDES**

- .1 Labour, Products equipment and services necessary for the finish carpentry work in accordance with the Contract Documents.

1.2 **REFERENCES**

- .1 ANSI A208.1, Particleboard.
- .2 ANSI/HPVA HP-1, Hardwood and Decorative Plywood.
- .3 ANSI/NEMA LD 3, High-Pressure Decorative Laminates.
- .4 APA - The Engineered Wood Association.
- .5 ASTM F1667, Driven Fasteners: Nails, Spikes and Staples.
- .6 Architectural Woodwork Manufacturers Association of Canada (AWMAC).
- .7 North American Architectural Woodwork Standards (NAAWS).
- .8 CAN/CSA O141, Softwood Lumber.
- .9 CSA O151-M, Canadian Softwood Plywood.
- .10 National Hardwood Lumber Association (NHLA) Rules for the Measurement and Inspection of Hardwood and Cypress.
- .11 National Lumber Grades Authority (NLGA) Standard Grading Rules for Canadian Lumber.

1.3 **SUBMITTALS**

- .1 Shop drawings: Submit shop drawings of finish carpentry work in accordance with Section 01 30 00 indicating:
- .1 Materials, thicknesses, sizes, finishes, wood species, grades, profiles, connection attachments, shop jointing, field jointing, reinforcing, anchorage, fastener types and sizes, location of exposed fastenings, mechanical and electrical service routes, service outlets, cutout locations, and sizes.
- .2 Include erection drawings, plans, elevations, sections, and details as applicable.

- .2 Samples: Submit samples of the following in accordance with the requirements of Section 01 30 00:
 - .1 Two (2) representative pieces of each type of wood to receive a stained or natural finish.
 - .2 Two (2) representative pieces of each type of wood finished as specified.
 - .3 Two (2) of each colour, pattern, gloss, and texture of compact and plastic laminate, in manufacturer's standard tag size.
 - .4 Two (2) samples of laminated plastic joints, edging, cutouts and postformed profiles.
 - .5 Two (2) of each solid surface, in 100 x 75 x 12 mm samples.
 - .6 Two (2) samples of melamine surfaced board, edging and postformed profiles.
 - .7 One (1) of each item of finish carpentry hardware.

1.4 **QUALITY ASSURANCE**

- .1 Execute work of this Section by member of AWMAC, with five (5) years experience in finish carpentry work of comparable complexity and scope. Submit proof of experience upon Consultant's request.
- .2 Fabricate finish carpentry work in accordance with NAAWS, Premium Quality materials and installation unless otherwise indicated. Perform work in accordance with the definition of Good Workmanship as defined in the NAAWS.
- .3 Remove and replace finish carpentry work which does not conform to the NAAWS or as amended by these Specifications.
- .4 Mock-up:
 - .1 Shop fabricate one mock-up of a base cabinet, wall cabinet, and counter top for each type of surfacing specified, complete with hardware and shop applied finishes, installed in location acceptable to Consultant.
 - .2 Arrange for Consultant's review and acceptance, allow 48 hours after acceptance before proceeding with work.
 - .3 When accepted, mock-up will demonstrate minimum standard for this work. Mock-up may remain as part of Work if accepted by Consultant. Remove and dispose of mock-ups which do not form part of Work.

1.5 **DELIVERY, STORAGE, AND HANDLING**

- .1 Deliver, store, and handle finish carpentry in accordance with the NAAWS. Control the temperature and humidity in accordance with the NAAWS recommendations, before, during, and after finish carpentry delivery, and also during storage and installation.
- .2 Cover finished plastic laminated work with heavy kraft paper or put in cartons during shipment. Protect installed surfaces by approved means. Do not remove until immediately before final inspection.

1.6 **EXTENDED WARRANTY**

- .1 Submit an extended warranty for compact and plastic laminate work of this Section in accordance with General Conditions, except that warranty period is extended to 2 years from date of Substantial Performance.
 - .1 Warrant against defects in material and workmanship including but not limited to opening of joints, cracking, shrinkage, warpage, and delamination of compact and plastic laminate.
 - .2 Coverage: Complete replacement including affected adjacent Work.

2 Products

2.1 **MATERIALS**

- .1 General: All materials under work of this Section, including but not limited to, adhesives and mastics, are to have low VOC content limits.
- .2 Concealed framing lumber and plywood:
 - .1 Eastern Spruce, Balsam Fir, or Jack Pine, to CAN/CSA O141, NLGA, and NAAWS Custom Grade, S4S, average moisture content 7% +/- 2% at installation.
 - .2 Softwood plywood: CSA O151-M; 19 mm unless indicated otherwise, G2S.
- .3 Hardwood lumber: Maple, unless otherwise indicated, to NHLA and NAAWS Premium Grade, S4S, average moisture content 7% +/- 2% at installation.
- .4 Wood veneer (WD-1): Baltic/Finnish Birch with Grade B face veneer to Handbook of Finnish Plywood in sizes and thickness shown on drawings. Refer to Section 09 06 00 Colour & Material Schedule.
- .5 Marine grade plywood (sinks, splashes, where shown): APA, Grade A-A, T & G, composed entirely of Douglas Fir or Western Larch, laminated with structural waterproof adhesive, exterior grade. Thickness as indicated on drawings.
- .6 Plastic laminate (PL-1): Provide plastic laminates conforming to ANSI/NEMA LD 3 as follows:
 - .1 Flatwork face sheet: 1.2 mm thick, heavy wear resistance.
 - .2 Vertical interior face sheets: 0.8 mm thick.
 - .3 Postformed face sheet: 0.8 mm thick.
 - .4 Backing sheet: thickness to match face sheet, high pressure laminate, manufactured by same manufacturer as face sheet.
 - .5 Plastic laminate: As manufactured by Arborite, Formica, Lamin-Art, and Lamitech HPL (Weston Premium Woods) and Wilsonart or approved equivalent.
 - .6 Colours (PL-#): Refer to Section 09 06 00 Colour & Material Schedule for each location and colour finish.

7. Melamine Surfaced Particleboard: ANSI A208.1, Grade M2 particleboard with a melamine impregnated decorative paper thermofused onto the surface. Edging to be done in minimum 2 mm thin PVC to match melamine colour. Colour for interior: White.
- .8 Particle board core: ANSI A208.1, Grade M2 of thickness indicated. Particleboard to be bound with waterproof adhesive and meeting the following minimum criteria:
 - .1 Density: minimum 705 kg/m³.
 - .2 Internal bond: 0.45 N/mm².
 - .3 Modulus of rupture: 14.5 N/mm².
 - .4 Modulus of elasticity: 2250 N/mm².
 - .5 Face screw holding: 1000 N.
 - .6 Edge screw holding: 900 N.
- .9 Tall Storage Units: 45 mm solid core wood doors with matching stiles. Doors to be installed on 38 mm x 45 mm solid hardwood rails. Rails to be rabbeted and glued to gables.
- .10 Laminating adhesive: CSA O112 Series, water resistant type, low VOC content, selected by laminate manufacturer for intended end use.
- .11 Draw bolts and splines: Type as recommended by fabricator.
- .12 Nails and staples: Conforming to ASTM F1667; Size and type to suit application, galvanized for exterior work, interior humid areas and for treated lumber; plain finish elsewhere.
- .13 Bolts, nuts, washers, blind fasteners, lags and screws: Size and type to suit application. Stapling is not acceptable.
- .14 Adhesive and bituminous mastic: Selected by the millwork fabricator with low VOC content.
- .15 Miscellaneous metals: In accordance with Section 05 50 00.
- .16 Finishing: In accordance with Section 09 91 00.

2.2 **HARDWARE**

- .1 The following hardware is the minimum quality standard for the work of this Section. Alternatives may be considered provided they are approved by Consultant prior to ordering of products.
- .2 Pulls (H-1): Refer to Section 09 06 00 Colour & Material Schedule for each location and colour finish.

- .3 19 mm Door Hinges: Blum Press-In 170 degree self close full overlay or Salice or approved equivalent. Hinges to be provided with factory installed knock in dowels. For quantity of hinges required per door, refer to hinge manufacturer's manual. Wood screw fastening system will not be accepted.
- .4 19 mm Door Hinge Plates: One piece plate with min. three (3) mm height adjustment. Hinge plates to be installed using pre-mounted system screws, Euro screw in five (5) mm pre-drilled hole. Wood screw fastening system will not be accepted.
- .5 19 mm Door Dampener: Blumotion 971A with Cruciform Base or Salice or approved equivalent required for all 19mm doors to allow for soft closing.
- .6 19 mm Bumpers: Polyurethane three (3) mm high X ten (10) mm diameter / minimum two (2) per door and drawer front.
- .7 Shelf Standards and Clips: KV 255 pilaster and KV 256 clip – satin nickel finish / Note: Pilasters to be fully recessed into gables.
- .8 Elbow catches: Richelieu Heavy Duty Elbow Catch # 5540180 or approved equivalent / nickel finish / required at all two door units.
- .9 Drawer Slides: Accuride 45 kg (100 lbs) #3832EC or approved equivalent x length to suit. Finish C - Clear Electroplating.
- .10 Safety release coat hook: High strength polycarbonate, screw mounted; Henkelhook or approved equivalent.

2.3 **PLASTIC LAMINATE WORK**

- .1 Perform plastic laminate Work in accordance with AWS Quality Standards and ANSI/NEMA LD 3.
- .2 Ensure adjacent parts of continuous laminate work match in colour and pattern.
- .3 Laminate plastic laminates to core materials in accordance with manufacturer's instructions.
- .4 Fabricate core surfaces and profiles with continuous support and bond over entire surface to receive plastic laminate.
- .5 Apply plastic laminate backing sheets to balance shrinkage stresses induced by plastic laminate face sheets.
- .6 Minimize joints in plastic laminate Work; do not install joints in plastic laminate Work in less than 2400 mm o.c. Locate joints minimum 610 mm from cut-outs. Offset core and plastic laminate facing joints.

- .7 Form shaped profiles and bends as indicated, using postformed grade laminate to laminate manufacturer's instructions.
- .8 Use straight self-edging laminate strip to match adjacent colour, finish, gloss, and pattern to cover exposed edge of core material. Chamfer exposed edges uniformly at approximately 20 degrees. Do not mitre laminate edges.
- .9 Apply laminated plastic liner sheet to interior of cabinetry and where indicated.
- .10 Fabricate units by solid surfacing manufacturer's certified or approved fabricator/installer. Fabricate built-up profiles as indicated.

2.4 **FABRICATION**

- .1 Be responsible for methods of construction and for ensuring that materials are rigidly and securely attached and will not be loosened by the work of other sections.
- .2 Coordinate locations of concealed supports and blocking with other parts of Work. Provide cutouts for outlet boxes and other fixtures.
- .3 Fabricate work in a manner which will permit expansion and contraction of the materials without visible open joints. Conceal joints and connections in wherever possible.
- .4 Set nails and countersink screws, apply wood filler to indentations, sand smooth and leave ready to receive finish.
- .5 Mitre exposed corners, no end grain shall be visible in completed installation.
- .6 Finish millwork in accordance with Section 09 91 00. Finished millwork shall be free from bruises, blemishes, mineral marks, knots, shakes and other defects and shall be selected for uniformity of colour, grain and texture.
- .7 Shop assemble finish carpentry to accommodate delivery and handling and to ensure passage through building openings.
- .8 Shop install cabinet hardware for doors, shelves and drawers. Recess shelf standards unless noted otherwise.
- .9 Fabricate sills, screens, frames and moldings to profiles shown.
- .10 Countertops:
 - .1 Core material shall be 19 mm thick particleboard with the exception of window stools and countertops with sinks installed, these shall be plywood core.
 - .2 Use draw bolts and splines in countertop joints. Maximum spacing 450 mm a.c., 76mm from edges.
 - .3 Veneer laminated plastic to core material in accordance with adhesive manufacturer's instructions. Ensure core and laminate profiles coincide to

- provide continuous support and bond over entire surface. Use continuous lengths up to 3050 mm.
- .4 Keep laminate joints 305 mm from sink cutouts. Obtain Consultant's approval for locations of all laminate joints in counter tops prior to fabrication .
- .5 Make joints where approved to hairline width. Offset joints in plastic laminate from joints in substrate.
- .6 Provide cutouts as required for inserts, grilles, outlet boxes and other fixtures. Radius internal corners, chamfer laminate edges, and apply uncut shellac sealer to exposed edges of substrate at all cutouts.
- .7 Nosing: As per detailed on Drawings.
- .8 Backsplash: square-edged, as detailed on the drawings.

3 Execution

3.1 **INSTALLATION**

- .1 Install Work in accordance with AWS Quality Standards and tolerances for Architectural Woodwork. Set and secure finish carpentry in place, rigid, plumb, square, and level.
- .2 Scribe and cut as required, fit to abutting walls, and surfaces, fit properly into recesses and to accommodate columns, fixtures, outlets, or other projecting, intersecting or penetrating objects leaving a 0.8 mm gap maximum.
- .3 Coordinate cutouts for plumbing fixtures, inserts, appliances, outlet boxes, and other fixtures, in finish carpentry. Round internal corners of cut-outs and seal exposed cores.
- .4 Form joints to conceal shrinkage.
- .5 Install draw bolts and splines in laminated plastic counter top joints at maximum spacing 450 mm o.c., and 75 mm from edge. Make joints flush, hairline butt joints.
- .6 Install draw bolts and splines in compact laminate counter top joints at maximum spacing 450 mm o.c., and 75 mm from edge. Make joints flush, hairline butt joints.
- .7 Install finishing hardware accurately and securely in accordance with manufacturer's directions, adjust and clean.
- .8 Install prefinished millwork at locations shown on drawings. Position accurately, level, plumb straight.
- .9 Apply bituminous coating over wood framing members in contact with masonry or cementitious construction.
- .10 Melamine panels: Assemble melamine millwork using dowelled/wafered-and-glue construction. Installed melamine panels shall not show any exposed fasteners on finished/exposed surfaces.

- .11 Storage cubicles :
 - .1 Install 400 mm deep cubicles with vertical divisions as indicated on drawings.
 - .2 Mechanically fasten to substrate with blocking and countersunk/plugged fasteners.
 - .3 Construct wood benches of sizes and details as noted.
 - .4 Anchor wood to supports in a concealed manner.
 - .5 Mitre joints at corners. Keep joints to a minimum.
 - .6 Round all corners, edges and ends.
 - .7 Install brackets and supports supplied under work of Section 05 50 00.

- .12 Fastening:
 - .1 Coordinate wall securement, anchorage, and blocking for finish carpentry items.
 - .2 Position items of finished carpentry work accurately, level, plumb, true and fasten or anchor securely.
 - .3 Design and select fasteners to suit size and nature of components being joined. Use proprietary devices as recommended by manufacturer.
 - .4 Provide heavy duty fixture attachments for wall mounted cabinets.
 - .5 Set finishing nails to receive filler. Where screws are used to secure members, countersink screw in round cleanly cut hole and plug with wood plug to match material being secured.

- .13 Remove and replace damaged, marked, or stained finish carpentry.

END OF SECTION

1 General

1.1 **SECTION INCLUDES**

- .1 Labour, Products, equipment and services necessary for firestopping and smoke seals work in accordance with the Contract Documents.

1.2 **REFERENCES**

- .1 ASTM C303, Standard Test Method for Dimensions and Density of Preformed Block and Board-Type Thermal Insulation.
- .2 ASTM C920, Standard Specification for Elastomeric Joint Sealants.
- .3 ASTM C1104, Standard Test Method for Determining the Water Vapor Sorption of Unfaced Mineral Fiber Insulation.
- .4 ASTM E814, Test Method for Fire Tests of Through-Penetration Fire Stops.
- .5 ASTM E2174, Standard Practice for On-Site Inspection of Installed Fire Stops.
- .6 CAN/ULC S102, Surface Burning Characteristics of Building Materials and Assemblies.
- .7 CAN/ULC S114, Standard Method of Test for Determination of Non-Combustibility in Building Materials.
- .8 CAN/ULC S115, Standard Method of Fire Tests of Firestop Systems.
- .9 CAN/ULC S129, Standard Method Of Test For Smoulder Resistance Of Insulation (Basket Method).
- .10 CAN/ULC S702, Thermal Insulation, Mineral Fibre for Buildings.

1.3 **DEFINITIONS**

- .1 Fire Separation: A construction assembly, plane or device, either vertical or horizontal, which is required to prevent the passage of fire and smoke for a prescribed period of time. Proof of compliance to required time rating shall be by ULC, Warnock Hersey (or similar approved) certification or shall be as listed in the Ontario Building Code Supplementary Standard SB-2.
- .2 Smoke Separation: A construction assembly, plane or device, either vertical or horizontal, which is not required to prevent the passage of fire for a prescribed period of time but is required to prevent the passage of smoke. A "Smoke Separation" is also known as a "Fire Separation with No Rating" or a "Zero Hour Rated Separation".
- .3 Non-Rated Separation: A construction assembly, plane or device, either vertical or horizontal, which is not required to prevent the passage of fire for a prescribed period of time and is not required to prevent the passage of smoke.

1.4 SYSTEM DESCRIPTION

- .1 Firestopping and smoke seals: ULC or Intertek Testing Services listed Products and systems in accordance with CAN/ULC S115 suitable to actual application and installation conditions.
- .2 Firestop applications that exist for which no ULC or cUL tested system is available through a manufacturer, a manufacturer's engineering judgment derived from similar ULC or cUL system designs or other tests will be submitted to local authorities having jurisdiction for their review and approval prior to installation. Engineer judgment drawings must follow requirements set forth by the International Firestop Council.
- .3 Firestop and smoke seal system shall achieve a fire resistance rating and smoke seal rating equal to that of assemblies into which they are installed.
- .4 Provide smoke sealants over firestopping materials or combination smoke seal/firestop seal material to form air tight barriers to retard the passage of gas and smoke.
- .5 Firestopping and smoke seals located at movement joints shall be designed with movement capability.
- .6 Firestopping and smoke seals within mechanical and electrical assemblies shall be provided as part of the work of Divisions 21, 22, 23, 26, 27, and 28 respectively.

1.5 SUBMITTALS

- .1 Product data:
 - .1 Submit copies of manufacturer's Product data in accordance with Section 01 30 00 indicating:
 - .1 Performance criteria, compliance with appropriate cUL or ULC reference standard, characteristics, limitations.
 - .2 Product transportation, storage, handling and installation requirements.
 - .3 Submit firestop and smoke seal manufacturer's Product data for materials and prefabricated devices, including manufacturer's printed installation instructions.
 - .2 Shop drawings:
 - .1 Submit shop drawings in accordance with Section 01 30 00 indicating:
 - .1 Fire rated and smoke sealed systems for each typical application.
 - .2 Construction details, accurately reflecting actual job conditions.
 - .3 ULC or Intertek Testing assembly listing.
 - .4 Each floor and wall assembly requiring firestop system with each corresponding ULC firestop system.
 - .3 Certification:
 - .1 Submit certified documentation from manufacturer for each worker performing work of this Section.
 - .2 Submit installer's and Product manufacturer's certification verifying compliance with the Contract Documents and conformance with ASTM E814 and CAN/ULC S115.

1.6 QUALITY ASSURANCE

- .1 Installers qualifications: Perform work of this Section by a company that has a minimum of five years proven experience in the installation of firestopping and smoke seal work of a similar size and nature and that is approved by manufacturer. Submit to Consultant, applicator's current certificate of approval by the material manufacturer as proof of compliance.
- .2 Manufacturer's direct representative and/or fire protection specialist shall be on-site during initial installation of firestop systems to train appropriate contractor personnel in proper selection and installation procedures conforming to manufacturer's written recommendations published in their literature and drawing details.
- .3 Pre-construction meetings: Arrange with manufacturer's representative, Contractor, Consultant and Field Engineer to determine responsibility for handling such issues as FT rated partitions, firestop custom details, compatibility, mixed penetrations, and to review installation procedures 48 hours in advance of installation.

1.7 DELIVERY STORAGE AND HANDLING

- .1 Deliver materials to Place of Work in manufacturer's unopened containers, containing classification label with labels intact and legible at time of use.
- .2 Do not use damaged or adulterated materials exceeding their expiry date.

1.8 SITE CONDITIONS

- .1 Conform to manufacturer's requirements and maintain a minimum temperature of 5° C for a minimum period of 24 h before application, during, and until application is fully cured.
- .2 Maintain sealant at a minimum 18° C for best workability.

2 Products

2.1 ACCEPTABLE MANUFACTURERS

- .1 Acceptable manufacturers of rated systems include:
 - .1 3M
 - .2 Hilti Canada Corporation.
 - .3 Specified Technologies Inc. (STI Firestop)
 - .4 Tremco Ltd.

2.2 GENERAL SYSTEM REQUIREMENTS

- .1 All materials under work of this Section, including but not limited to, primers and sealants are to have low VOC content limits.
- .2 Do not use Products containing asbestos.

- .3 Firestopping components shall not contain volatile solvents or require special application to protect plastic pipe from firestopping compound.
- .4 Provide smoke seal sealant in following colours:
 - .1 Grey or white in finished areas.
 - .2 Red in unfinished areas.
- .5 Smoke sealant for overhead and vertical joints for floor to be self-levelling and non-sagging sealant.
- .6 Smoke sealant at vertical through penetrations in areas with floor drains shall be waterproof type.

2.3 **MATERIALS**

- .1 Following materials have been provided for convenience. Contractor shall provide complete system with all components and accessories as required for fire resistant and smoke seal installation.
- .2 Firestop sealant: single component, low modulus, silicone rubber, moisture curing sealant to ASTM C920, ULC labelled to CAN/ULC S115.
- .3 Pre-Installed firestop devices for use with non-combustible and combustible pipes, conduit and/or cable bundles penetrating concrete floors and walls.
 - .1 Cast-in place firestop device complete with aerator adaptor when used in conjunction with aerator system. Model CP 680-P by Hilti or approved alternative.
 - .2 Cast-in place firestop device for use with noncombustible penetrants. Model CP 680-M by Hilti or approved alternative.
 - .3 Speed sleeve for use with cable penetrations. Model CP 653 by Hilti or approved alternative.
 - .4 Firestop block. Model CFS-BL by Hilti or approved alternative.
- .4 Re-penetrable, round cable management devices for use with new or existing cable bundles penetrating walls:
 - .1 Speed sleeve with integrated smoke seal fabric membrane. Model CP 653 by Hilti or approved alternative.
 - .2 Firestop Sleeve. Model CFS-SL SK by Hilti or approved alternative.
 - .3 Retrofit sleeve for use with existing cable bundles. Model CFS-SL RK by Hilti or approved alternative.
 - .4 Gangplate for use with multiple cable management devices. Model CFS-SL GP by Hilti or approved alternative.
 - .5 Gangplate Cap for use at blank openings in gangplate for future penetrations. Model CFS-SL GP CAP by Hilti or approved alternative.
- .5 Firestop insulation: to CAN/ULC S702, Type 2; mineral fibre manufactured from rock or slag, suitable for manual application.
 - .1 Density: Minimum 64 kg/m³ when tested to ASTM C303.
 - .2 Combustibility: Noncombustible to CAN/ULC S114.
 - .3 Melt temperature: >1175 degrees C.

- .4 Surface burning characteristics: to CAN/ULC S102, maximum flame spread of 0, smoke developed of 0.
 - .5 Moisture Absorption: 0.04 percent when tested to ASTM C1104.
 - .6 Smoulder Resistance: 0.01 percent when tested to CAN/ULC S129.
- .6 Damming, back-up, supports, and anchorage: In accordance with manufacturer's fire rated systems and to acceptance of authorities having jurisdiction.
- .7 Primer: As recommended by firestopping sealant manufacturer.

3 Execution

3.1 **EXAMINATION**

- .1 Verify condition and dimensions of previously installed Work upon which this Section depends. Report defects to Consultant. Commencement of work of this Section means acceptance of existing conditions.
- .2 Verify that substrates and surfaces to receive firestopping and smoke seals are clean, dry, and frost free.

3.2 **PREPARATION**

- .1 Prepare, modify, and adjust void sizes, proportions, and conditions to conform to fire rated and smoke sealed assembly requirements such as assembly opening size and dimensional restrictions.
- .2 Clean surfaces to remove material detrimental to bond including dust, paint, rust, oil, grease, moisture, frost and other foreign matter to manufacturers recommendations.
- .3 Mask adjacent surfaces to avoid spillage and over-coating of adjacent surfaces. Remove stains from adjacent surfaces.

3.3 **INSTALLATION**

- .1 Install firestopping and smoke seal systems in accordance with reviewed Shop Drawings, manufacturer's instructions and fire rated assembly to establish continuity and integrity of fire separations.
- .2 Install firestop insulation in compacted thicknesses required by ULC design. Compress insulation approximately 50 percent.
- .3 Install primers as recommended by firestop and smoke seal Product manufacturers.
- .4 Install temporary forming, damming, back-up as required, remove after materials have achieved initial cure and will resist displacement.
- .5 Install firestop and smoke seal filler in horizontal joints providing 25% compression fit.

- .6 Use resilient, elastomeric firestopping and smoke seal systems in following locations:
 - .1 Openings and sleeves for future use.
 - .2 Penetration systems subject to vibration or thermal movement.
 - .3 Penetration systems in acoustical containment enclosures.
- .7 Trowel and tool exposed firestop and smoke seal. Product surfaces to uniform, smooth finish.
- .8 Seal joints to ensure an air and water resistant seal capable of withstanding compressions and extensions due to thermal wind or seismic joint movement.
- .9 Taped joints will not be acceptable.
- .10 Repair damaged firestopped and smoke sealed surfaces to acceptance of Consultant.
- .11 Identify each firestop and smoke seal penetration assembly with permanent label listing following:
 - .1 Assembly and rating in hours.
 - .2 Date of installation.
 - .3 Installing company's name and telephone number.
- .12 Do not cover materials until full cure has taken place.

3.4 **INSPECTION AND TESTING**

- .1 Inspection of through-penetration firestopping shall be performed in accordance with ASTM E2174 to ensure that firestopping and smoke seals have been installed in accordance with Contract documents and to tested and listed firestop system.

3.5 **CLEAN-UP**

- .1 Clean all surfaces adjacent to sealed holes and joints to be free of excess firestop materials and soiling as work progresses.
- .2 Remove excess materials and debris immediately after application.

3.6 **SCHEDULE OF FIRESTOP AND SMOKE SEAL LOCATIONS**

- .1 Following firestop and smoke seal location schedule is included for convenience and may not be complete. Examine Contract Drawings and other specification sections and determine entire extent of work of this Section. Generally provide systems with required fire and smoke ratings at following locations:
 - .1 Gaps at intersections of fire-resistance rated walls and partitions.
 - .2 Control and sway joints in fire-resistance rated walls and partitions.
 - .3 Gaps at top of fire-resistance rated partitions and walls.
 - .4 Penetrations through fire-resistance rated walls and partitions including but not limited to mechanical and electrical services and openings and sleeves for future use.
 - .5 Penetrations through fire-resistance rated floor slabs, ceilings, and roofs.
 - .6 Gaps at edge of floor slabs at exterior walls.

- .7 Perimeter of retaining angles on rigid ducts greater than 0.012 m², firestopping material between retaining angle and fire separation and between retaining angle and duct, on each side of fire separation.
- .8 Where indicated on drawings.
- .9 At non-rated assemblies that require a smoke seal.
- .10 Where required by Ontario Building Code.

END OF SECTION

1 General

1.1 **SECTION INCLUDES**

- .1 Labour, Products, equipment and services necessary for sealant Work in accordance with the Contract Documents.
- .2 Work of this Section does not include sealants in firestopping and smoke sealed assemblies.
- .3 Work of this Section does not include sealant work identified in individual specification sections.

1.2 **REFERENCES**

- .1 ASTM C834, Specification for Latex Sealants.
- .2 ASTM C920, Specification for Elastomeric Joint Sealants.
- .3 ASTM C1330, Specification for Cylindrical Sealant Backing for Use with Cold Liquid Applied Sealants.

1.3 **SUBMITTALS**

- .1 Product data: Submit copies of Product data in accordance with Section 01 30 00 describing type, composition and recommendations or directions for surface preparation, material preparation and material installation.
- .2 Samples:
 - .1 Submit following samples in accordance with Section 01 30 00.
 - .1 Two samples of sealant/caulking, for colour selection.
 - .2 Two samples of back-up material and primer for physical characteristics.

1.4 **QUALITY ASSURANCE**

- .1 Qualifications: Work of this Section shall be executed by trained applicators approved by sealant manufacturer and having a minimum of 5 years proven experience.

1.5 **SITE CONDITIONS**

- .1 Do not install materials when ambient air temperature is less than 5 °C, when recesses are wet or damp, or to manufacturer's recommendations.

1.6 **DELIVERY, STORAGE AND HANDLING**

- .1 Arrange delivery of materials in original, unopened packages with labels intact, including batch number, and ensure that on-site storage is kept to a minimum. Do not store materials on site where there exists any danger of damage from moisture, direct sunlight, freezing and other contaminants.

1.7 **EXTENDED WARRANTY**

- .1 Submit a extended warranty for Sealant Work in accordance with General Conditions, except that warranty period is extended to 5 years. Warrant against leakage, cracking, crumbling, melting, shrinkage, running, loss of adhesion and staining adjacent surfaces. Warranty shall be for complete replacement including affected adjacent Work.

2 Products

2.1 **MATERIALS**

- .1 General:
 - .1 All materials under work of this Section, including but not limited to, primers and sealants are to have low VOC content limits.
 - .2 Use materials as received from manufacturers, without additives or adulterations. Use one manufacturer's Product for each kind of Product specified.
- .2 Sealant **Type A**: ASTM C920, Type S, Grade NS, Class 35; One-part, non-sag type, silicone sealant, in standard colours selected.
 - .1 'Dowsil CWS' by Dow Consumer Solutions.
 - .2 'Sikasil WS-305 CN' by Sika.
 - .3 'Tremsil 400' by Tremco.
- .3 Sealant **Type B**: ASTM C920, Type S, Grade NS; One-part mildew-resistant silicone, in standard colours selected.
 - .1 'Dowsil 786 Mildew Resistant Silicone Sealant' by Dow Consumer Solutions.
 - .2 'Sikasil GP Mildew Resistant' by Sika.
 - .3 'Tremsil 200 Silicone Sealant' by Tremco Ltd.
- .4 Sealant **Type C**: ASTM C920, Type M, Grade P, Class 25; Multi-component polyurethane-base, elastomeric sealant with self levelling properties, in standard colours selected.
 - .1 'Sikaflex 2c SL ' by Sika, or approved alternative.
- .5 Sealant **Type D**: ASTM C834; Pure acrylic siliconized sealant; in standard white colour (paintable).
 - .1 '950A Siliconized Acrylic Latex Caulk' by Sherwin Williams.
 - .2 'Tremflex 834 Silconized Sealant' by Tremco Ltd.

2.2 **ACCESSORIES**

- .1 Primers: Type recommended by material manufacturers for various substrates, primers to prevent staining of adjacent surfaces encountered on project.
- .2 Joint backing: ASTM C1330; Round, solid section, closed cell, skinned surface, soft polyethylene foam gasket stock, compatible with primer and sealant materials, 30 to 50% oversized, Shore A hardness of 20, tensile strength 140 to 200 kPa. Bond breaker type surface.

- .3 Bond breaker: Type recommended by material manufacturers.
- .4 Void filler around the window frames to be one part expanding polyurethane foam.
- .5 Cleaning agents: As recommended by material manufacturer, non-staining, harmless to substrates and adjacent finished surfaces.

2.3 **MIXING**

- .1 Follow manufacturers instructions on mixing, shelf and pot life.

3 Execution

3.1 **EXAMINATION**

- .1 Verify condition and dimensions of previously installed Work upon which this Section depends. Report defects to Consultant. Commencement of work of this Section means acceptance of existing conditions.

3.2 **INSPECTION**

- .1 Verify that joint sealants, backing, and other materials containing hazardous materials have been removed.
- .2 Verify that joint substrates and adjoining materials are structurally sound.
- .3 Verify that joints to be renovated can be satisfactorily repaired with the specified methods and materials.

3.3 **PREPARATION**

- .1 Protect adjacent exposed surfaces to prevent smearing, staining or other damage, by masking or other means, prior to performing work. Make good any damage caused by sealant application. Remove protection upon completion and clean adjacent, exposed surfaces of any compound deposited upon such surfaces.
- .2 Mildew removal: Scrub with solution of TSP and rinse with water, and allow to dry completely.
- .3 Erect scaffolding and rigging required to perform sealant work in accordance with reviewed Shop Drawings.
- .4 Prepare joints to receive sealants to manufacturer's instructions. Ensure that joints are clean and dry and ferrous surfaces are free from rust and oil.

- .5 Clean recesses to receive sealant, to be free of dirt, dust, loose material, oil, grease, form release agents and other substances detrimental to sealant's performance.
 - .1 Remove lacquer or other protective coatings from metal surfaces, without damaging metal finish, using oil-free solvents. Remove rust, mill scale and coatings from ferrous metals by wire brush, grinding or sand blasting.
 - .2 Ensure recess is dry.
 - .3 Do not apply sealants to joint surfaces treated with sealer, curing compound, water repellent, or other coatings. Remove incompatible coatings as required.
- .6 Ensure that all materials in contact with sealant are compatible. Test substrate for adhesion.
- .7 Depth of recess: Maintain depth to ½ joint width up to a maximum of 13 mm and not less than 6 mm at centre of joint. For greater depth, use joint backing under. Where recess is less than specified depth, cut back surface of recess to specified recess depth.
- .8 Install polyethylene backing rod in joints 6 mm or more in width. Roll backing rod into joint. Do not stretch or bend backing rod. Install bond breaker to back of recess.
- .9 Prime sides of recess, in accordance with sealant manufacturer's instructions.
- .10 Prime all surfaces to ensure proper bond to tile, to eliminate potential staining of porous surfaces, and as required by sealant manufacturer.
- .11 Condition products for use in accordance with manufacturer's recommendations.

3.4 **INSTALLATION**

- .1 Apply sealant immediately after adjoining work is in condition to receive such work. Apply sealant in continuous bead using gun with correctly sized nozzle. Use sufficient pressure to evenly fill joint.
- .2 Ensure sealant has full uniform contact with, and adhesion to, side surfaces of recess. Superficial painting with skin bead is not acceptable. Tool sealant to smooth surface, free from ridges, wrinkles, sags, air pockets, embedded impurities, dirt, stains or other defects.
 - .1 At recesses in angular surfaces, finish sealant with flat profile, flush with face of material at each side.
 - .2 At recesses in flush surfaces, finish compound with concave face, flush with face of material at each side.
- .3 Make sealant bead uniform in colour.
- .4 Cure sealants in accordance with sealant manufacturer's instructions. Do not cover up sealants until proper curing has taken place.
- .5 Immediately remove excess compound or droppings which would set up or become difficult to remove from adjacent finished surfaces, using recommended cleaners, as work progresses. Do not use scrapers, chemicals or other tools which could damage finished surfaces. Remove defective sealant.

- .6 Clean recesses and re-apply sealant.
- .7 Remove masking tape immediately after joints have been sealed and tooled.

3.5 **CLEANING**

- .1 Clean surfaces adjacent to joints, remove sealant smears or other soiling resulting from application of sealants. At metal surfaces, remove residue. Do not mar or damage finishes on materials adjacent to joints. Repair or replace marred or damaged materials.

3.6 **SCHEDULE OF LOCATIONS**

- .1 Following sealant location schedule is included for convenience and may not be complete. Examine Contract Drawings and other specification sections and determine entire extent of work of this Section. Generally seal following locations:
 - .1 Concrete, masonry, wood and stone to metal.
 - .2 Wood to masonry, concrete and stone.
 - .3 Metal to metal.
 - .4 All dissimilar materials.
 - .5 Where 'sealant' or 'caulking' is indicated on drawings.
- .2 Sealant **Type A**:
 - .1 Interior control joints, except in floors .
 - .2 Door frames, interior and exterior side.
 - .3 Protrusions through interior and exterior walls and floors, interior and exterior side, except where fire rated seals are required.
 - .4 Seal thresholds.
- .3 Sealant **Type B**:
 - .1 Control joints in vertical tiled areas.
 - .2 Between vanity and tile.
 - .3 Between vanity and mechanical fixtures/fittings.
 - .4 Between access panels and tile.
 - .5 Between tiles and adjacent materials.
- .4 Sealant **Type C**:
 - .1 Control joints in horizontal tiled areas.
- .5 Sealant **Type D**:
 - .1 Perimeter of counters.
 - .2 Perimeter of interior windows.
 - .3 Perimeter of firehose cabinets.
 - .4 Junction between drywall and masonry.

END OF SECTION

1 General

1.1 **SECTION INCLUDES**

- .1 Labour, Products, equipment and services necessary for metal door and frame work in accordance with the Contract Documents.

1.2 **REFERENCES**

- .1 ASTM A653/A653M, Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvanealed) by the Hot-Dip Process.
- .2 ASTM A924/A924M, Standard Specification for General Requirements for Steel Sheet, Metallic-Coated by the Hot-Dip Process.
- .3 CAN4/ULC-S104M, Standard Method for Fire Test of Door Assemblies.
- .4 CAN4/ULC-S105M, Standard Specification for Fire Door Frames, Meeting the Performance Required by CAN4/ULC-S104M.
- .5 CAN/CGSB-1.198, Cementitious Primer, (for Galvanized Surfaces).
- .6 CGSB 41-GP-19Ma, Rigid Vinyl Extrusions for Windows and Doors.
- .7 CAN/ULC-S702, Thermal Insulation, Mineral Fibre for Buildings.
- .8 CSA W47.1, Certification of Companies for Fusion Welding of Steel Structures.
- .9 CSA W59-M, Welded Steel Construction (Metal Arc Welding).
- .10 CSDMA, Canadian Steel Door Manufacturers Association.
- .11 NFPA 80, Standard for Fire Doors and Other Opening Protectives.

1.3 **SUBMITTALS**

- .1 Product data: Submit manufacturer's Product data in accordance with Section 01 30 00 indicating door and frame construction.
- .2 Shop drawings:
.1 Submit shop drawings in accordance with Section 01 30 00 for each type of door and frame indicating:
.1 Thickness and type of steel.
.2 Thickness and type of core.
.3 Thickness and type of steel stiffeners and location of them within the door.
.4 Thickness and type of metal facing on edges of door and method of fastening.
.5 Location of mortises, reinforcement, anchorages, joining, welding, sleeving, exposed fasteners, openings and arrangement for hardware.

- .2 Include schedule identifying each unit with door marks and numbers relating to numbering on Contract Drawings and in door schedule. Indicate doors and frames to be fire rated.

1.4 **QUALITY ASSURANCE**

- .1 Perform work in accordance with requirements of the Canadian Steel Door Manufacturer's Association (CSDMA).
- .2 Label and list fire rated doors and frames by an organization acceptable to authorities having jurisdiction and accredited by the Standards Council of Canada in conformance with CAN4/ULC-S104M and CAN4/ULC-S105M for ratings indicated, Labelling shall be in accordance with NFPA 80.

2 Products

2.1 **ACCEPTABLE MANUFACTURERS**

- .1 Daybar Industries Limited
- .2 Fleming Doors Products.
- .3 Steelcraft.
- .4 Vision Hollow Metal Limited.
- .5 Approved alternative.

2.2 **MATERIALS**

- .1 General: All materials under work of this Section, including but not limited to, primers are to have low VOC content limits.
- .2 Steel: ASTM A924/A924M, Class 1; Commercial grade steel, hot dip galvanized to ASTM A653/A653M, ZF120 galvanized coating.
- .3 Minimum base steel thickness:
 - .1 Frames 1.6 mm
 - .2 Typical doors 1.6 mm
 - .3 Interior stiffeners 0.9 mm
 - .4 Lock/strike reinforcements 1.6 mm
 - .5 Hinge reinforcements 2.7 mm
 - .6 All other reinforcement 1.6 mm
 - .7 Top and bottom channels 1.2 mm
 - .8 Glazing stops 0.9 mm
 - .9 Guard boxes 0.9 mm
 - .10 Jamb spreaders 0.9 mm
- .4 Top caps and thermal breaks: CGSB 41-GP-19Ma; Rigid PVC extrusions.

- .5 Primer: CAN/CGSB 1.198.
- .6 Core material:
 - .1 Interior doors: Mineral fibre insulation with a minimum face density of 24 kg/m³.
 - .2 Fire rated doors: Mineral fibre insulation to CAN/ULC S702, Type 1A; 24 kg/m³.
- .7 Screws: Stainless steel screws with countersunk flat head.
- .8 Door silencers: Type 6-180, black neoprene.
- .9 Frame anchors:
 - .1 Frames in masonry: 1.2 mm minimum, adjustable T-strap jamb anchors.
 - .2 Frames in steel stud partitions: 0.9 mm minimum steel anchors of suitable design securely welded inside each jamb.
 - .3 Labeled frames: In accordance with ULC requirements.
- .10 Floor anchors: 1.6 mm minimum adjustable floor clip angles with 2 holes for anchorage to floor.
- .11 Labels for fire doors and door frame: Brass plate, riveted to door and door frame.
- .12 Grilles: Corrosion resistant steel with baked enamel finish. Model 61DG Series by Nailor Industries Inc or approved alternative by Hart and Cooley.
- .13 Glass and glazing: In accordance with Section 08 80 00.

2.3 **FABRICATION**

- .1 General
 - .1 Fabricate doors and frames in accordance with reviewed shop drawings.
 - .2 Welding: CSA W59-M to produce a finished unit with no visible seams or joints, square, true and free of distortion.
 - .3 Welding: Continuous unless specified otherwise. Execute welding by a firm fully acceptable to the Canadian Welding Bureau to requirements of CSA W47.1.
 - .4 Form profiles accurately to details shown on Contract Drawings.
 - .5 Ream and remove burrs from drilled and punched holes.
 - .6 Grind welded corners and joints to a flat plane and fill with metallic filler and sand to a uniform smooth finish. Apply one coat of primer.
 - .7 Provide weather strip for exterior doors in accordance with Section 08 70 00 and door manufacturer.
- .2 Frames screens:
 - .1 Fabricate frames of welded construction for typical areas. Cut mitres and joints accurately and weld continuously on inside of frame profile.
 - .2 Construct large frame sections with provision for on Site assembly to suit Site conditions.
 - .3 Blank, reinforce, drill and tap frames for mortised, templated hardware. Protect mortised cut-outs with guard boxes.
 - .4 Reinforce frames where required for surface mounted hardware.

- .5 Reinforce frames over 1200 mm wide with roll formed steel channels or hollow structural sections specified in Section 05 50 00 and as indicated on drawings.
- .6 Furnish exterior door frames with a continuously welded integral steel weather drip at head of frame.
- .7 Prepare each door opening for single stud rubber door silencers, 3 for single door openings located in strike jamb, and 2 for double door openings located in head.
- .8 Install 2 channel or angle spreaders per frame, to ensure correct frame alignment. Install stiffener plates or spreaders between frame trim where required, to prevent bending of trim and to maintain alignment when setting in place.
- .9 Form channel glazing stops minimum 16 mm height, accurately cut, mitred, fitted and fastened to frame sections with stainless steel counter-sunk, flat head screws spaced at maximum 450 mm throughout and 50 mm from each end.
- .10 Provide the following requirements for electrified frame applications:
 - .1 Low voltage wire conduit for required electrified hardware devices.
 - .2 Junction boxes for all frame mounted electrified hardware devices, complete with required connectors to in frame low voltage wire conduit.
- .3 Anchorage:
 - .1 Anchor units to floor and wall construction. Locate each wall anchor immediately above or below each hinge reinforcement on hinge jamb and directly opposite on strike jamb, minimum number of anchors for each jamb:
 - .1 Frames up to 2285 mm 3 anchors.
 - .2 Frames from 2285 mm to 2440 mm 4 anchors.
 - .2 Where frames are to be set in masonry or concrete, supply adjustable anchors to trade installing frame.
 - .3 Fabricate frames for installation in steel stud partitions with steel anchors of suitable design, minimum number of anchors for each jamb :
 - .1 Frames up to 2285 mm height 4 anchors.
 - .2 Frames 2285 mm to 2440 mm 5 anchors.
 - .4 Frames in previously placed concrete, masonry, precast or structural steel: Anchors located at 150 mm maximum from top and bottom of each jamb, and intermediate anchors at maximum 660 mm o.c.
- .4 General Door Requirements:
 - .1 Hollow steel construction, flush swing type, of sizes to conform to details, schedules and reviewed shop drawings with provisions for cut-outs for glass and grilles and reinforced to receive hardware fastenings.
 - .2 Blank, reinforce, drill and tap doors for mortised, templated hardware. Where required, reinforce doors for surface mounted hardware and door closers.
 - .3 Reinforce oversized doors with steel channels and plates specified in Section 05 50 00 and as indicated on drawings.
 - .4 Where openings are required, form integral cut-outs with framing, glass stop moldings and division bars.
 - .5 Install grilles to fit tight and secure into openings.
 - .6 Bevel both stiles of single doors 1 in 16.
 - .7 Reinforce doors with galvanized metal stiffeners at 150 mm o.c.
 - .8 Provide the following requirements for electrified door applications:
 - .1 In door low voltage wire raceways.

- .2 Steel astragals for hollow metal doors.
- .3 Reinforcement for all door mounted electrified hardware devices as required and as indicated on Contract Drawings.

.5 Interior Doors:

- .1 Supply and install inverted, recessed, fully welded channels at top and bottom of doors.
- .2 Fabricate doors with joints between front and back panels meeting on stile edges. Make joints continuously welded for entire height of door. After welding has been completed, grind joints smooth to match metal. Ensure that no filler is used in joints.
- .3 Fill hollow space within door and vertical stiffeners from top to bottom with mineral fibre batt insulation.

.6 Fire Rated Doors:

- .1 Supply and install inverted, recessed, spot welded channels at top and bottom of doors. Supply and install steel flush top caps on exterior doors.
- .2 Fabricate doors with joints between front and back panels meeting on stile edges. Make joints continuously welded for entire height of door. After welding has been completed, grind joints smooth to match metal. Ensure that no filler is used in joints.
- .3 Fabricate doors to achieve fire rating as indicated on drawings and in accordance with ULC. Provide ULC label plate on door at hinged edge midway between top hinge and head of door.

3 Execution

3.1 **EXAMINATION**

- .1 Verify condition and dimensions of previously installed Work upon which this Section depends. Report defects to Consultant. Commencement of work of this Section means acceptance of existing conditions.

3.2 **HOLLOW METAL DOOR, FRAME AND SCREEN INSTALLATION**

- .1 Install hollow metal doors, frames, and screens in accordance with reviewed shop drawings, manufacturer's written instructions and to meet CSDMA requirements.
- .2 Install hollow metal doors, frames, and screens plumb, square, level, secure, and at correct elevation.
- .3 Install doors clear of floor finishes, and with the correct rebate opening for the door installation. Install door silencers.

- .4 Secure anchorages and connections to adjacent construction. Brace frames rigidly in position while building-in. Remove temporary steel shipping jamb spreaders. Install wood spreaders at third points of frame rebate height to maintain frame width. Supply and install vertical supports as indicated on drawings for openings over 1200 mm in width. Remove wood spreaders after frames have been built-in.
- .5 Allow for structural deflection and prevent structural loads from being transmitted to hollow metal frames.
- .6 Touch-up areas where galvanized coating has been removed or damaged with primer.
- .7 Fire rated doors: Install fire rated doors and frames in accordance with requirements of NFPA 80.

3.3 **ADJUSTING AND CLEANING**

- .1 Adjust doors for smooth and balanced door movement.
- .2 Clean doors, frames, windows and screens.

END OF SECTION

1 General

1.1 **SECTION INCLUDES**

- .1 Labour, Products, equipment and services necessary for finish hardware work in accordance with the Contract Documents.
- .2 Supply and installation of door hardware will be handled by a cash allowance specified in Division 1.

1.2 **REFERENCES**

- .1 BHMA, Builders Hardware Manufacturing Association.
- .2 NFPA 80, Standard for Fire Doors and Other Opening Protectives.

1.3 **DESIGN REQUIREMENTS**

- .1 Automatic door equipment:
 - .1 Design handicap door system comprising of low energy power operator with optional push and go door system as defined in ANSI/BHMA A156.19.
 - .2 Design system operator to activate if one push button from either side of door is pushed. Actuated door shall open slowly to back check (80°) in 3 to 6 seconds and to full open position in 4 to 7 seconds. Door shall remain open for period set to suit requirements (period of 5 to 30 seconds). After time delay door shall close by spring in door operator from 90° to 10° in 3 to 6 seconds from 10° to fully closed in 1-1/2 to 2 seconds.

1.4 **SUBMITTALS**

- .1 Product data: Submit manufacturer's Product data in accordance with Section 01 30 00 indicating compliance with reference standards, transportation, storage, handling and installation requirements.
- .2 Shop Drawings:
 - .1 Submit Shop Drawings and 3 complete hardware lists in accordance with Section 01 30 00 indicating:
 - .1 Door locations, sizes, hardware manufacturer's catalogue numbers, finish symbols and quantities required.
 - .2 Locations and mounting heights of each type of hardware.
 - .2 Supply templates and required information to door and frame manufacturer to enable accurate sizes, locations of cut-outs and reinforcement for hardware.
 - .3 Submit templates to required trade to arrange for provisions for accurate setting and fitting of hardware.
 - .4 Automatic door equipment: All connections, attachments, reinforcing, anchorage and location of exposed fastenings.

- .3 Samples:
 - .1 Submit 2 samples in accordance with Section 01 30 00 of each item that is different from hardware specified and include manufacturer's parts lists and installation instructions.
 - .2 Submit hardware component samples illustrating style, colour and finish. Tag samples identifying applicable Specification article number, brand name and number, finish, building location, date and catalogue number.
 - .3 Do not order hardware until samples have been accepted. Submit new samples to replace rejected samples. Supply hardware and finishes identical to each accepted sample.

- .4 Closeout submittals:
 - .1 Submit the following in accordance with Section 01 78 00 for each Product for incorporation into Operation and Maintenance Manual:
 - .1 Maintenance data.
 - .2 Operating instructions and safety precautions.
 - .3 Parts list with name and address of supplier.
 - .4 Lubrication schedule and type of lubricant recommended.
 - .5 Keys, tools and special devices.
 - .6 Inspection procedures related to preventive maintenance.

1.5 **QUALITY ASSURANCE**

- .1 General:
 - .1 Manufacturers: Companies specializing in manufacturing door hardware and registered with BHMA.
 - .2 Hardware supplier: Company specializing in supplying commercial door hardware and acceptable to manufacturer.

- .2 Certifications:
 - .1 Employ an Architectural Hardware Consultant to inspect completed installation and certify that hardware has been installed in accordance with manufacturer's printed instructions, Authorities having Jurisdiction and as specified.
 - .2 Submit manufacturer's certificate that finish hardware and fire rated hardware meets specified requirements.

1.6 **DELIVERY, STORAGE, AND HANDLING**

- .1 Be responsible for packaging of hardware, on a set by set basis. As material is received from various manufacturers identify it to correspond to Hardware List symbols.

- .2 Label packages legibly, indicating manufacturer's number, types, sizes, opening number and Hardware List reference number. Wrap hardware and include in package, screws, bolts and fastening necessary for correct installation. If hardware package is not complete, pay additional charges incurred by installer.

- .3 Deliver hardware to Site packaged, labelled and cross-referenced to hardware list for each item and its scheduled installation location.

- .4 Accept Products of this Section on Site and ensure that each item is undamaged.

.5 Catalogue and store hardware in secure area.

2 Products

2.1 **GENERAL**

.1 Carefully check and verify Hardware List against Contract Drawings to ensure that hardware listed can be used as specified. Inform Consultant of concerns regarding quality, quantity, operation or function of hardware selected:

- .1 Verify hand of doors, examine details on Contract Drawings and at Site to ensure hardware supplied can be correctly installed and is correct for work as constructed.
- .2 Select hardware in accordance with applicable codes and regulations and to approval of local Fire Marshal.
- .3 Replace and pay for defective hardware including hardware which was incorrectly selected, and remedial and installation costs.

.2 Ensure that hardware selected will function correctly, meets Contract requirements and Ontario Building Code and authorities having jurisdiction.

.3 Ensure that each hardware item is of same type, design and by same manufacturer.

.4 Manufacturer's names or trade marks are not permitted on exposed surfaces of hardware.

.5 Include in packing slip a list of parts, name of supplier and door number in which lock is to be installed.

.6 Hardware for fire rated and labelled door and frame assemblies: ULC listed or as accepted by authorities having jurisdiction.

.7 Fire rated assemblies:

- .1 Hardware: Selected and installed in accordance with applicable codes and regulations, NFPA-80 and to approval of Ontario Fire Marshal.
- .2 Fire rated doors: ULC labelled hardware. Submit written certification of conformance to ULC requirements for each type of hardware prior to delivery.
- .3 Locksets and latchsets on fire rated doors: 19 mm throw minimum.

2.2 **ACCESSORIES**

.1 Items to be attached to masonry or concrete with expandable shields, lag screws, bolts or other fastening devices as required. Exposed screws: Stainless steel, Phillips or Robertson heads.

2.3 **FINISHES**

.1 Metal finishes: Free from defects, clean, unstained and of a uniform colour for each type of finish required. Exposed surfaces and anchors: Specified finish symbol of item.

3 Execution

3.1 **EXAMINATION**

- .1 Verify condition and dimensions of previously installed Work upon which this Section depends. Report defects to Consultant. Commencement of work of this Section means acceptance of existing conditions.

3.2 **INSTALLATION**

- .1 Install hardware in accordance with reviewed Shop Drawings, manufacturer's installation instructions, and applicable Codes and regulations.
- .2 Install hardware in accordance with hardware templates.
- .3 Adjust fixed and operable hardware for correct clearances and function.
- .4 Mount hardware measured from finished floor to centre of hardware, unless indicated otherwise or required by Code:
 - .1 Top hinge: 250 mm (10") from head of door to top.
 - .2 Bottom hinge: 265 mm (10-1/2") from finished floor to bottom of hinge.
 - .3 Intermediate hinge: Equal distance between top and bottom hinge.
 - .4 Locksets, latchsets: 1000 mm (3'-3").
 - .5 Panic device crossbar: 1000 mm (3'-3").
 - .6 Push plates: 1100 mm (3'-8") to bottom of plates.
 - .7 Guard bars: 1100 mm (3'-8").
 - .8 Door pulls: 1100 mm (3'-8") to bottom of pulls.
 - .9 Blank strike: 1450 mm (4'-9").
 - .10 Blank fronts: 1450 mm (4'-9").
- .5 Automatic door equipment:
 - .1 Install automatic door operators, controls and accessories for doors indicated in accordance with reviewed shop drawings, manufacturer written instructions and to meet requirements of authorities having jurisdiction.
 - .2 Doors shall operate manually as though equipped with manual door closers, without damage to automatic door components, in event of power failure or in event of power termination.
 - .3 Coordinate this work with applicable Sections as required.
 - .4 Power supply to each door operator and wiring shall be provided by Division 26 - Electrical. Make connections at operators and at control panel and supply and install each electrical work between operators and activating controls. Comply with requirements of Division 26 - Electrical. All wiring shall be concealed and where exposed shall be run in conduit. Location of exposed wiring shall be subject to Consultant's approval.
- .6 Include for supply and installation of wiring for electric strikes from electrical junction box to electric strike hardware.
- .7 Locate door stops to contact doors 75 mm from latch edge.

- .8 Install hardware and trim square and plumb to doors.
- .9 Replace wrappings for hardware provided by manufacturer after installation.
- .10 Safeguard keys to keep them out of unauthorized hands, tag them with door number, and deliver them to person designated by Consultant at building completion.

3.3 **FIELD QUALITY CONTROL**

- .1 Have hardware inspected after installation by hardware supplier's representative, obtain certification in writing that hardware has been supplied and installed in accordance with Specifications and hardware manufacturer's instructions and is functioning correctly.
- .2 Inspect fire rated openings to ensure they are installed in compliance with NFPA 80 requirements and Authorities having Jurisdiction.
- .3 Test access control system and electrified hardware devices for proper operation. Verify electric door release hardware operates properly upon activation of fire alarm system.

3.4 **ADJUSTING**

- .1 Verify under work of this Section, that installed hardware functions properly.
- .2 Adjust hardware so that latches and locks operate smoothly and without binding, and closers act positively with the least possible resistance in use. Lubricate hardware if required by manufacturer's instructions.
- .3 Adjust doors with self closing devices or automatic closing devices for proper operation after the HVAC system is balanced and adjusted. Verify spring power of non sized door closers is properly adjusted.

3.5 **CLEANING**

- .1 Remove wrappings at completion of the Project and clean hardware in accordance with manufacturer's instructions.

3.6 **HARDWARE GROUPS/SCHEDULE**

- .1 Hardware groups/schedule:
 - .1 Provide hardware schedule to Consultant for review indicating products, materials and finishes.
 - .2 Do not order products until schedule has been reviewed by the Consultant.

END OF SECTION





1. GENERAL NOTES:


1. Read Room Finish & Colour Schedule in conjunction with full specifications and drawings.
2. It is the sub trades' responsibility to review the Room Finish & Project Finish Schedule and bring to the attention of the consultant any discrepancies, errors or inconsistencies. Those proceeding with work are responsible to correct mistakes.
3. Where specified products have more than one approved manufacturer, colour selections are indicated for each manufacturer. No alternates will be allowed where finishes are single sourced.
4. Provide paint finish on all exposed interior surfaces and components as described in specification section 09 91 00 Painting. This includes architectural, structural, mechanical and some electrical components.
5. Grout to be Kiesel Royal. **No other grout will be allowed on this project.** Tile pattern as indicated on drawings.
6. All interior Hollow Metal (HM) doors and frames to be painted to match existing.
7. Where flooring has a direction/ pattern the subtrade must confirm Consultants intent prior to installing. Those proceeding without written confirmation will be responsible to correct mistakes. All flooring to be feathered to meet flush with adjacent finishes.

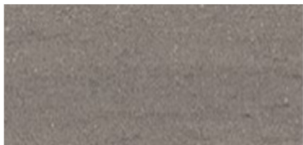
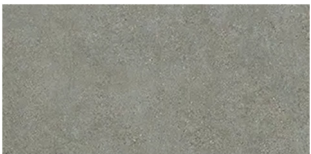

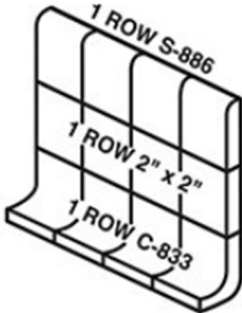
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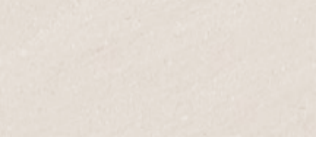

*	REFER TO REMARKS COLUMN
AL or ALUM	ALUMINUM
A.BLK	ARCHITECTURAL BLOCK
ACT	ACOUSTIC CEILING TILE
BFPB	BARRIER FREE PUSH BUTTON
BH	BREAKAWAY HOOKS
BL or BLK	BLOCK
BKHD	BULKHEAD
BN	BULLNOSE
BR	BRICK
CC	COVE CAP
CL or CLR	CLEAR (NO FINISH)
CONC	CONCRETE
CPT	CARPET TILE
CT	CERAMIC TILE
CW	CURTAIN WALL
EP	EPOXY PAINT
EPC	EXPOSED PRECAST CONCRETE
ES	EXPOSED STRUCTURE
EX or EXIST	EXISTING
EXP	EXPOSED
FEC	FIRE EXTINGUISHER CABINET
FF	FACTORY FINISH
GL	GLAZING
GWB	GYPSUM WALL BOARD
HM	HOLLOW METAL
HT	HEIGHT
LVT	LUXURY VINYL TILE
OWSJ	OPEN WEB STEEL JOIST
PT	PAINT
PL or PLAM	PLASTIC LAMINATE
RB	RESILIENT BASE
RSF	RESILIENT SHEET FLOORING
STN	STAIN
W/	WITH
WD	WOOD


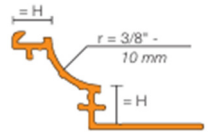
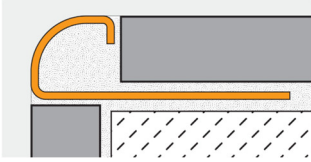
3. FINISHES SELECTION

06 20 00 Finish Carpentry			
Code	Material	Remarks	Image
PL-1 (Countertop)	Supplier: Arborite Product: High Pressure Laminate Colour: Arctic Ice P395 CA Finish: Matte		
	OR		
	Approved Equal		
PL-2 (Control Panel)	Supplier: Formica Product: High Pressure Laminate Colour: Amber Maple 7012-58 Finish: Matte		
	OR		
	Approved Equal		
WD-1 (Millwork)	White Birch Rotary Cut Hardwood veneer c/w 3mm PVC matching Edgeband	1. Post-catalyzed Lacquer Finish	
H-1 (Cabinet Pull)	Supplier: Richelieu Product: Functional Steel Pull 33205195 Finish: Brushed Nickel Dimensions: 96mm Center to Center	1.To be used if existing hardware is not useable.	

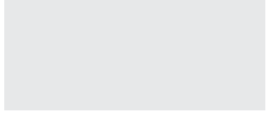
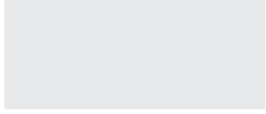
09 30 00 Tiling			
Code	Material	Remarks	Image
T-1 (Floor Tile)	Supplier: Centura Product: Glocal Collection Size: 300mm x 600mm Colour: Ideal Finish: Matte	1. Grout Colour: Kiesel Servoperl Royale Middle Grey 2.Tile to be Installed in a stack pattern 3.Tile and adjacent flooring to be flush.	

	OR		
	Supplier: Stone Tile Product: Kursaal Collection Size: 300mm x 600mm Colour: Rust Finish: Matte	1. Grout Colour: Kiesel Servoperl Royale Basalt 2.Tile to be Installed in a stack pattern 3.Tile and adjacent flooring to be flush.	
	OR		
	Supplier: Revigres Tile Distributed by Holten Impex Product: Cityzen Collection Size: 300mm x 600mm Colour: Cityzen Gris Finish: Matte Rectified	1. Grout Colour: Kiesel Servoperl Royale Stone Grey 2.Tile to be Installed in a stack pattern 3.Tile and adjacent flooring to be flush.	
T-2 (Floor Tile)	Supplier: Daltile Product: Keytones Collection Size: 50mm x 50mm Colour: D617 Arctic White Straight Joint Finish: Matte	1. Grout Colour: Kiesel Servoperl Royale White 2.Tile to be Installed in a stack pattern 3.Tile and adjacent flooring to be flush. 4. Tile to have Build Up Cove Base Shape Number MB5B	 
	OR		
Approved Equal			


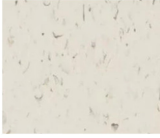
WT-1 (Wall Tile)	Supplier: Centura Product: Glocal Collection Size: 300mm x 600mm Colour: Clear Finish: Matte	1. Grout Colour: Kiesel Servoperl Royale Snow 2.Tile to be Installed in a horizontal stack pattern to align with floor tile pattern. 3.DM-1 used as a cove between floor and wall tile.	
	OR		
	Supplier: Stone Tile Product: Kursaal Collection Size: 300mm x 600mm Colour: Pure Finish: Matte	1.Grout Colour: Kiesel Servoperl Royale Pergamon 2.Tile to be Installed in a horizontal stack pattern to align with floor tile pattern. 3.DM-1 used as a cove between floor and wall tile. 4.DM-2 used at all outside corners	
	OR		
Supplier: Supplier: Revigres Tile Distributed by Holten Impex Product: Cityzen Collection Size: 300mm x 600mm Colour: Cityzen Off White Finish: Matte Rectified	1.Grout Colour: Kiesel Servoperl Royale Snow 2.Tile to be Installed in a horizontal stack pattern to align with floor tile pattern. 3.DM-1 used as a cove between floor and wall tile.		



<p>DM-1 (Cove Between Floor and Wall Tile)</p>	<p>Supplier: Schluter Systems Product: DILEX-AHK Colour: Satin Anodized Aluminum (AE) Size: To Suit Material Finish: Satin Anodized</p>	<p>1.DM-1 cove to be used between floor and wall junctions</p>	 
<p>DM-2 (Finishing/ Edge Protection Wall Tile)</p>	<p>Supplier: Schluter Systems Product: Rondec Colour: Satin Anodized Aluminum (AE) Size: To Suit Material Finish: Satin Anodized</p>	<p>1.DM-2 used at all outside corners of wall tile.</p>	

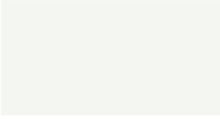

09 51 00 Acoustic Ceiling Panels


Code	Material	Remarks	Image
<p>ACT-1 (Per Reflected Ceiling Plan)</p>	<p>Supplier: CGC Inc. Product: Mars ClimaPlus 88185 Square Lay-In Tile With Compasso Standard *\" Trim Size: 610mm x 1220mm x 16mm Colour: White Panel, White T Grid</p>	<p>1. Suspension Grid System: Donn DX - 23mm wide exposed T- grid - White</p>	
	OR		
	<p>Supplier: Armstrong Product: 1913 Ultima Fine Texture Square Lay-in tile with Axiom 8\" Trim Size: 610mm x 1220mm x 16mm Colour: White Panel, White T Grid</p>	<p>1. Suspension Grid System: Prelude XL – 23mm wide exposed T-grid - White</p>	

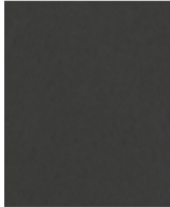
09 65 00/09 65 16/09 65 19 Resilient Flooring, Resilient Base and Accessories and Resilient Tile Flooring

Code	Material	Remarks	Image
<p>VCT-1 (As per Finishes Plan)</p>	<p>Supplier: Armstrong Product: Standard Excelon Imperial Texture Colour: 51839 Fortress White Size: 305mm x 305mm Thickness: 3.2mm</p>	<p>1. Project to be from one Dye Lot. 2. Floor to be feathered up to meet flush with tile</p>	
	OR		
	<p>Supplier: Tarkett Product: VCT II Colour: 556 Sandstone W Size: 305mm x 305mm Thickness: 3.2mm</p>	<p>1. Project to be from one Dye Lot. 2. Floor to be feathered up to meet flush with tile</p>	
OR			

	Approved Equal		
RB-1 (To be used with VCT)	Supplier: Johnsonite Product: Baseworks Thermoset Rubber Wall Base With Toe 4"H x 0.125" Thick Colour: TB1 Peppercorn TBC	1.Colour to match existing	
	OR		
	Supplier: Roppe Product: 700 Series Wall base With Toe 4"H x 0.125" Thick Colour: 194 Burnt Umber TBC	1.Colour to match existing	
	OR		
	Approved Equal		

06 91 00 Painting			
Code	Material	Remarks	Image
PT-1 (Hollow Metal Door & Frame)	Supplier: Benjamin Moore /Sherwin Williams Product: Latex Acrylic Scuff X/Scuff Tuff Colour: Chantilly Lace OC-65 Finish: Semi - Gloss	1.Colour to match existing	
PT-2 (Ceilings & Bulkheads)	Supplier: Benjamin Moore Product: Latex Acrylic Colour: Chantilly Lace OC-65 Gloss Finish: Flat	1.Benjamin Moore Interior Paint Colours Given for Reference Only.	
PT-3 (Walls As Required)	Supplier: Benjamin Moore Product: Latex Acrylic Colour: Chantilly Lace OC-65 Gloss Finish: Eggshell	1.Benjamin Moore Interior Paint Colours Given for Reference Only.	

10 21 13 Phenolic Core Compartments			
Code	Material	Remarks	Image
	Supplier: Hadrian Manufacturing Inc. Product: Floor Mounted Headrail Braced Phenolic Toilet partitions Series: Standard Series 58" Material: Solid phenolic w/black core (polished edge) Panel/door height: 1473mm (58")		

	Panel Colour: 315 Dark Grey Class A Hardware Colour: Brushed Stainless Steel Continuous Hinges and High-Security Screws		
	OR		
	Supplier: ASI Global Partitions Product: Floor Anchored/Overhead Braced Phenolic Toilet partitions Series: Standard Privacy 58" Material: Solid phenolic w/black core (polished edge) Panel/door height: 1473mm (58") Panel Colour: 2150 Graphite Hardware Colour: Brushed Stainless Steel Continuous Hinges and High-Security Screws		
	OR		
	Approved Equal		

4. SCHEDULE:

.1 See schedule on drawing A201.

1 General

1.1 **SECTION INCLUDES**

- .1 Design, labour, Products, equipment and services necessary for gypsum board work.

1.2 **REFERENCES**

- .1 ASTM A653/A653M, Specification for Steel Sheet, Zinc-coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvanealed) by the Hot-Dip Process.
- .2 ASTM C475, Specification for Joint Compound and Joint Tape for Finishing Gypsum Board.
- .3 ASTM C645, Specification for Nonstructural Steel Framing Members.
- .4 ASTM C665, Mineral-Fiber Blanket Thermal Insulation for Light Frame Construction and Manufactured Housing.
- .5 ASTM C754, Specification for Steel Framing Members to Receive Screw-Attached Gypsum Board.
- .6 ASTM C834, Standard Specification for Latex Sealants.
- .7 ASTM C840, Specification for Application and Finishing of Gypsum Board.
- .8 ASTM C1002, Specification for Steel Self-Piercing Tapping Screws for the Application of Gypsum Panel Products or Metal Plaster Bases to Wood Studs or Steel Studs.
- .9 ASTM C1178, Specification for Glass Mat Water-Resistant Gypsum Backing Board.
- .10 ASTM C1278, Specification for Fiber-Reinforced Gypsum Panel.
- .11 ASTM C1396, Specification for Gypsum Board.
- .12 CAN/ULC-S102, Standard Method of Test for Surface Burning Characteristics of Building Materials and Assemblies.
- .13 CAN/ULC-S702, Mineral Fibre Thermal Insulation for Buildings.

1.3 **DESIGN REQUIREMENTS**

- .1 Design gypsum board wall and ceiling systems with a maximum deflection of $l/360$.
- .2 Design ceiling suspension system in accordance with manufacturer's printed directions and ASTM C754.

- .3 Design ceiling system for adequate support of electrical fixtures as required by the current bulletin of the Electrical Safety Authority.
- .4 Design hanger anchor and entire suspension system static loading not to exceed 25% of their ultimate capacity including lighting fixture dead loads.
- .5 Design suspension system to support weight of mechanical and electrical items such as air handling boots and lighting fixtures, and with adequate support to allow rotation/relocation of light fixtures.
- .6 Design subframing as necessary to accommodate, and to circumvent, conflicts and interferences where ducts or other equipment prevent the regular spacing of hangers.
- .7 Design wall framing system and reinforce as necessary to accommodate and support items attached to and supported by wall framing system.
- .8 Design wall framing system for wall assemblies with a height greater than 3000 mm and those assemblies incorporating non-standard gypsum board assemblies including, but not limited to, abuse resistant gypsum board, and large format tile applications.

1.4 **REGULATORY REQUIREMENTS**

- .1 Provide fire separations and fire protection exactly as specified in test design specification that validates the specified rating. Verify that work specified in other Sections, as a part of the entire assembly, meets applicable validating test design specification.

1.5 **SUBMITTALS**

- .1 Product data:
 - .1 Submit copies of manufacturer's Product data in accordance with Section 01 30 00 indicating:
 - .1 Performance criteria, compliance with appropriate reference standard, characteristics, and limitations.
 - .2 Product transportation, storage, handling and installation requirements.
 - .2 Shop Drawings:
 - .1 Submit Shop Drawings in accordance with Section 01 30 00 indicating:
 - .1 Wall assemblies, suspension systems, adjacent construction, elevations, sections and details, dimensions, thickness, finishes and relationship to adjacent construction.
 - .2 Framing and blocking for items being supported of wall systems.
 - .3 Fire rated designs

- .3 Certifications: Submit written certification stating that suspended ceiling system is designed for adequate support of electrical fixtures as required by the current bulletin of the Electrical Safety Authority.

1.6 **QUALITY ASSURANCE**

- .1 Qualifications: Execute the work of this Section by skilled, qualified, and experienced workers trained in the installation of the work of this Section.
- .2 Retain a Professional Engineer, licensed in Province of Ontario, with experience in work of comparable complexity and scope, to perform following services as part of work of this Section:
 - .1 Design of wall systems with height greater than 3000 mm and at non-standard gypsum board assemblies including, but not limited to, assemblies incorporating abuse resistant gypsum board, and large format tile applications.
 - .2 Design of suspended gypsum board assemblies.
 - .3 Review, stamp, and sign Shop Drawings and design calculations.
 - .4 Conduct shop and on-site inspections, prepare and submit written inspection reports verifying that this part of Work is in accordance with Contract Documents and reviewed Shop Drawings.

1.7 **SITE CONDITIONS**

- .1 Do not begin work of this Section until:
 - .1 Mechanical and electrical work above the ceiling is complete.
 - .2 Substrate and ambient temperature is above 15°C.
 - .3 Relative humidity is below 80 %.
 - .4 Ventilation is adequate to remove excess moisture.
- .2 Install temporary protection and facilities to maintain Product manufacturer's, and above specification, environmental requirements 24 h before, during, and 24 h after installation.

2 **Products**

2.1 **MATERIALS**

- .1 General: All materials under work of this Section, including but not limited to, sealants, adhesives, and primers are to have low VOC content limits.
- .2 Steel framing: ASTM C754; ASTM A653/A653-M, Z275; cold rolled, galvanized steel sheet.
 - .1 Bailey Metal Products Limited
 - .2 Corus Metal Profiles
 - .3 Or approved equivalent.

- .3 Steel studs and track runners: ASTM C645; Galvanized steel studs and runners, 32 mm wide x depth as indicated on Contract Drawings. Formed from galvanized steel sheet, thicknesses as follows:
 - .1 Studs less than 3000 mm: Minimum 0.53 mm (25 ga.).
 - .2 Studs greater than 3000 mm and non-standard assemblies: Minimum 0.91 mm (20 ga.), unless stud thickness of greater thickness is required to accommodate intended loading, spans, or conditions.
 - .3 Track runners and ancillary components to match stud thickness.
- .4 Main carrying channels: ASTM C645; Formed from galvanized steel sheet, 38 x 19 mm cold rolled, channels.
- .5 Resilient channel: ASTM C645; 0.5 mm thick galvanized metal, 57 mm wide x 12 mm deep for walls and ceiling to reduce sound transmission.
- .6 Furring channels: ASTM C645; Formed from galvanized steel sheet, 22 mm winged flange type, cold rolled.
- .7 Furring channels (hat type): ASTM C645; 0.5 mm base steel thickness, galvanized. 70 mm wide x 22 mm deep hat shaped channel.
- .8 Heavy duty furring channels: ASTM C645; 0.9 mm steel thickness, galvanized hat shaped channel with a wider and deeper size as required by manufacturers.
- .9 Hanger wires: 4.1 mm minimum diameter galvanized pencil rod.
- .10 Tie wire: 1.6 mm thick minimum diameter, soft annealed, galvanized steel wire.
- .11 Corner bead, casing bead, and special shapes: Formed from 0.6 mm thick minimum, galvanized steel sheet, designed to be concealed by joint compound.
- .12 Deflection track: ASTM C 645 top runner with 50.8-mm- deep flanges, in thickness indicated for studs and in width to accommodate depth of studs.
- .13 Deflection track (fire rated): Provide 25 mm deep leg deflection track where indicated on rated walls. 'Fire Trak Shadowline' by Fire Trak Corporation or approved equivalent.
- .14 Ceiling clips: Hot dip galvanized partition attachment clips, in square and reveal edge; 'PAC 15 Series' to match grid system by CGC Inc. or approved equivalent.
- .15 Gaskets (acoustic partitions): Adhesive-backed, closed-cell vinyl foam strips that allow fastener penetration without foam displacement, 3.2 mm thick, in width to suit steel stud size.
- .16 Control joint strip: Roll formed from galvanized steel sheet, with a tape protected recess, 6 mm wide x 11 mm deep.
- .17 Screw fasteners: ASTM C1002 Type S; Corrosion resistant.

- .18 Concrete anchors: tie wire sleeve anchors, 'Redi-Drive Anchors' by ITW Red Head or approved equivalent.
- 19. Batt insulation:
 - .1 Batt insulation (non-rated): CAN/ULC-S702, Type 1, friction fit; 'Unfaced Thermal and Sound Control Batts' by Johns Manville, 'Pink Next Gen Fiberglas Insulation' by Owens Corning Canada or 'ComfortBatt' by Rockwool.
 - .2 Batt insulation (fire-rated/acoustic): ASTM C665, Paperless, semi-rigid, spun stone wool fibre mats, of thickness as indicated on Contract Drawings, 'MinWool SAFB' by Johns Manville, 'SAFB Thermafiber' by Owens Corning Inc. or 'Rockwool AFB' by Rockwool.
- .20 Standard sealants:
 - .1 Acoustic sealant (non-rated): Non-hardening acoustic sealant for use at non-rated assemblies, ASTM C834; Lightweight, acrylic, mould resistant sealant, paintable. 'Lightweight Smoke and Acoustic Sealant CS-S SA Light' by Hilti or approved equivalent.
 - .2 Fire-rated sealant: Non-hardening sealant for use at fire-rated assemblies: CAN/ULC-S102; Acrylic based firestop sealant, colour: red or white as selected by Consultant. 'Flexible Firestop Sealant CP606' by Hilti or approved equivalent.
 - .3 Fire-rated seal: Non-hardening seal for use at fire-rated assemblies: CAN/ULC-S102; Flexible seal for installation between top track and substrate. 'Firestop Top Track Seal CFS-TTS' by Hilti or approved equivalent.
 - .4 Standard sealants: In accordance with Section 07 92 00.
- .21 Polyethylene vapour retarder: In accordance with Section 07 26 00.
- .22 Gypsum board: ASTM C1396; gypsum board 12.7 mm thick of maximum practical lengths to minimize end joints, unless indicated otherwise. Furnish Board by Certainteed Gypsum Canada, CGC Inc., or Georgia-Pacific Canada LP.
- .23 Fire rated gypsum board: ASTM C1396; gypsum board 15.9 mm thick of maximum practical lengths to minimize end joints, unless indicated otherwise. Furnish Type X Board by Certainteed Gypsum Canada, CGC Inc., or Georgia-Pacific Canada LP or approved equivalent.
- .24 Moisture, mould, and abuse resistant panels: 15.9 mm thick unless indicated otherwise on drawings; 'AirRenew Extreme Impact Resistant with M2Tech' by Certainteed Gypsum Canada, 'Sheetrock Mold Tough AR' by CGC Inc. or 'DensArmor Plus Abuse-Resistant Interior Panel' by Georgia-Pacific Canada LP or approved equivalent.
- .25 Tile Backer: Water resistant tile backer board meeting ASTM C1178 or ASTM C1278, thickness as indicated. 'Diamondback Tile Backer' by Certainteed Gypsum Canada, 'Fiberock Aqua-Tough Underlayment' by CGC Inc. or 'Dens Shield' by Georgia-Pacific Canada LP or approved equivalent.

- .26 Primer: Where indicated by board manufacturer, provide primer as required to achieve finishes as defined in ASTM C840.
- .27 Joint reinforcing tape:
 - .1 Standard gypsum board: ASTM C475; 50 mm wide x 0.25 mm thick, perforated paper, with chamfered edges.
 - .2 Moisture resistant and tile backer boards: ASTM C475; fibreglass mat joint tape as recommended by board manufacturer to suit location.
- .28 Bonding adhesive: Type for purpose intended and as recommended and approved by manufacturer.
- .29 Joint and patching compound: ASTM C475; Asbestos-free, supplied by manufacturer of gypsum board used.
- .30 Fast setting patching compound: ASTM C475; Asbestos-free, Sheetrock or Durabond by CGC Inc., 'Moisture and Mold Resistant Setting Compound with M2Tech' by Certainteed Gypsum Canada or approved equivalent.
- .31 Access doors: Supplied by other Sections for installation as part of the work of this Section.

3 Execution

3.1 **EXAMINATION**

- .1 Verify condition and dimensions of previously installed Work upon which this Section depends. Report defects to Consultant. Commencement of work of this Section means acceptance of existing conditions.

3.2 **SUSPENSION FRAMING**

- .1 Install ceiling systems in accordance with reviewed Shop Drawings and manufacturer's written instructions.
- .2 Install hanger wires plumb and securely anchored to the building structural framing, independent of walls, pipes, ducts, and metal deck; install additional framing and hangers to bridge interference items.
- .3 Install hanger wires at 1200 mm maximum centres along carrying channels, not less than 25 mm, and not more than 150 mm from channel ends.
- .4 Install additional hangers at lighting fixture and ductwork locations. Do not attach hanger wires to mechanical or electrical equipment. Do not support mechanical and electrical fixtures and fitting on ceiling without the ceiling manufacturer's written acceptance.

- .5 Install main carrying channels transverse to structural framing members. Lap main carrying channels 200 mm minimum at splices and wire each end with two loops and prevent clustering or lining-up of splices.
- .6 Install furring channels at 400 mm o.c., not less than 25 mm, and not more than 150 mm from perimeter walls, at openings, at interruptions in ceiling continuity, and at change in plane. Install furring channels to a tolerance of three (3) mm maximum in 3600 mm.
- .7 Install additional main carrying and furring channels to frame and to reinforce openings such as recessed lighting fixtures, access hatches, ceiling grilles, outlet boxes, ventilating outlets and similar items.

3.3 **STEEL STUDS AND FURRING**

- .1 Install steel studs and furring in accordance with reviewed Shop Drawings and manufacturer's written instructions.
- .2 Install steel stud partitions to underside of structure unless indicated otherwise.
- .3 Install track runners at floors, ceilings, and underside of structure; align track runners accurately and secure to structure at 600 mm centres maximum.
- .4 Install double top track runner assembly to prevent the transmission of structural loads to steel studs.
- .5 Install steel studs vertically at 400 mm o.c., unless otherwise indicated, and not more than 50 mm from abutting walls, at openings, and at each side of corners. Install studs securely to track runners.
- .6 Schedule and coordinate steel framing installation with mechanical and electrical services installation.
- .7 Install full height, double studs at door and service openings, fastened together and stiffened back to the structure to prevent vibration when doors close.
- .8 Provide double studs boxed together at all openings, sill, head and jambs and at door jambs, fastened together and stiffened back to the structure to prevent vibration. At each opening exceeding 900 mm in width double studs shall be 20 ga. extending to structure above, and adequately anchored at each end. Provide steel studs above and below openings spaced at 400 mm oc maximum. All metal stud partitions above doors and screens over 1220 mm wide shall be secured to structure over and reinforced with sway bracing to stabilize walls to prevent lateral movement.
- .9 Erect three studs at corner and intermediate intersections of partitions. Space 50 mm apart and brace together with wired 19 mm channels.

- .10 Stiffen partitions over 2440 mm high or 3000 mm long, or both, with horizontal bracing extended for full length of partitions. Provide one line of bracing in partitions. Space lines to provide equal unbraced panels. Provide bracing for portions of partitions over door openings in partitions over 3000 mm high, and bracing both above and below openings in partitions located no greater than 150 mm from top and bottom of opening, and extending two stud spaces beyond each edge of opening for both doors and windows. Wire tie or weld bracing to studs.
- .11 Frame control joints using back to back double studs at abutting structural elements, at dissimilar backup interface, at dissimilar walls and ceilings, at structural expansion and control joints, at door and other openings, and at 9000 mm maximum spacing in continuous runs. Install control joint strips and secure in place.
- .12 Install additional support framing at openings and cutouts for built-in equipment, upper cabinet support, access panels and similar items.
- .13 Attach to framing adequate steel reinforcing members or an 18 ga. steel stud mounted horizontally and notched around furring members to support the load of, and to withstand the withdrawal and shear forces imposed by, items installed upon the work of this Section. Such items include, but are not restricted to, coat hooks, washroom accessories, handrail anchors, rub rails, grab bars, guards, wall-hung cabinets and fitments, shelving, curtain and drape tracks; Owner supplied equipment; and minor mechanical and electrical work. Heavy mechanical and electrical equipment shall be self-supporting in Divisions 21, 22, 23 and 26.
- .14 Provide for support and incorporation of flush-mounted and recessed mechanical and electrical equipment and fixtures only after consultation and verification of methods with those performing the work of Divisions 21, 22, 23 and 26.
- .15 Install cross bracing in accordance with the steel stud manufacturer's recommendations.

3.4 **FIRE RATED ASSEMBLIES**

- .1 Install Products in fire rated assemblies in strict accordance with reviewed Shop Drawings and applicable tested and approved designs required by Authorities Having Jurisdiction.
- .2 Install firestop fill material behind fire rated acoustical sealant and provide firestop identification tag.
- .3 Stiffen fire rated walls over 3.66 m high, where linear length of wall is greater than 2.44 m between perpendicular wall supports, with diagonal bracing above the ceiling extending perpendicular to wall at a 45° angle to structure above. Locate diagonal bracing at maximum 2.44 m o.c.
- .4 Where double layers of gypsum board are shown, and required for fire rating, screw first layer to studs and furring and laminate the second layer to the first using joint filler as an adhesive. Stagger joints between first and second layers.

3.5 **INSTALLATION**

- .1 Install insulation in longest panel sizes possible in accordance with manufacturer's instructions.
- .2 Butt insulation with moderate contact and, cut and fit them tightly around other construction elements. Offset single layer vertical joints and both vertical and horizontal joints in multiple layer applications.
- .3 Make thermal insulation continuous, maintain thermal protection continuity and secure to prevent displacement. Ensure that insulation is tight to substrate without air gaps.
- .4 Cut and fit thermal insulation tightly around electrical boxes, plumbing and heating pipes and ducts, exterior doors and windows, and other protrusions.
- .5 Leave 75 mm separation between thermal insulation and heat emitting devices such as recessed light fixtures.
- .6 Cut and trim thermal insulation neatly to fit spaces; do not compress insulation to fit. Install only thermal insulation boards which are free from chipped or broken edges.
- .7 Fill miscellaneous cavities with insulation to maintain continuity of thermal barrier. Do not compress insulation to fit.
- .8 Arrange for Consultant to review thermal insulation before it is enclosed.
- .9 Install batt insulation in partitions, between studs, and as indicated on Contract Drawings and in accordance with the manufacturer's instructions.
- .10 Fill stud cavities to full height of partitions and carefully cut and fit required batt insulation type around services and protrusions.

3.6 **ACOUSTICAL SEALANT**

- .1 Install acoustical sealant to acoustically insulated partitions in accordance with the manufacturer's instructions and Contract Drawings.
- .2 Install acoustical sealant under floor runner track, at partition perimeter both sides and at openings, cut-outs, and penetrations, concealed from view in the final installation.
- .3 Smooth acoustical sealant with trowel prior to skin forming.

3.7 **GYPSUM BOARD**

- .1 Comply with ASTM C840. Install gypsum board in accordance with reviewed Shop Drawings and manufacturer's written instructions.

- .2 Install gypsum board vertically or horizontally, whichever results in fewer end joints. Locate end joints over supporting members.
- .3 Install gypsum board in lightly butted contact at edges and ends and with 1.6 mm maximum open space between boards; do not force gypsum board into place. Do not install imperfect, damaged or damp boards.
- .4 Install gypsum board butting paired tapered edge joints, and mill-cut or field-cut end joints; do not place tapered edges against cut edges or ends.
- .5 Install vertical joints minimum 300 mm from the jamb lines of openings and stagger vertical joints over different studs on opposite sides of partitions.
- .6 Do not locate joints within 200 mm of corners or openings, except where control joints occur at jamb lines or where openings occur adjacent to corners. Where necessary, place a single vertical joint over the centre of wide openings.
- .7 Install gypsum board over concrete and concrete masonry units with adhesive as recommended by gypsum board manufacturer where indicated on Drawings.
- .8 Cut, drill and patch gypsum board as may be necessary to accommodate the work of other trades.
9. Fire Separations:
 - .1 Construct gypsum board assemblies, where located, in accordance with tested assemblies to obtain required or indicated fire rated assemblies. As a minimum fire separations shall consist of metal framing covered on both sides by fire-rated gypsum board.
 - .2 Install assemblies tightly to enclosing constructions to maintain integrity of the separations. Install casing beads at all perimeter edges.

3.8 **CORNER, CASING BEADS AND TRIM**

- .1 Corner reinforcing bead: Install along all external angles, erect plumb, level and with a minimum of joints. Secure with screws at 225 mm o.c. apply filler over flanges flush with nose of the bead and extending at least 75 mm onto surface of board each side of corner. When filler dries, apply a thin coat of topping cement and blend onto adjoining surfaces.
- .2 Casing bead: Install where wallboard butts against a surface having no trim concealing the juncture and where shown on drawings. Erect casing beads plumb or level, with minimum joints, and secure with screws at 300 mm o.c. apply filler over flange flush with bead and extending at least 75 mm onto surface of board. When dry, apply a thin coat of topping cement and blend onto adjoining surfaces.
- .3 Recess channels and trim: Install recess channels and special metal trim where shown. Secure to substrate. Provide casing beads full height on wallboard edges at recess channels and metal trim.

3.9 **JOINT TAPING AND FINISHING**

- .1 Install reinforcing tape and a minimum of 3 coats of joint compound over gypsum board joints, metal trim and accessories, and screw fasteners in accordance with the gypsum board manufacturer's instructions.
- .2 Fill gaps between ,and any imperfections in, gypsum boards with joint compound, allow to dry, and sand smooth ready for painting.
- .3 Install finished gypsum board work smooth, seamless, plumb, true, flush, and with square, plumb, and neat corners.
- .4 Finish gypsum board in accordance with ASTM C840 to the following grades:
 - .1 Level 0: No taping, finishing, or accessories required. Use above suspended ceilings and within other concealed spaces, unless the assembly is fire rated, sound rated, sound or smoke controlled, or unless the space serves as an air plenum.
 - .2 Level 1: At joints and interior angles embed tape in joint compound. Leave surface free of excess joint compound. Tool marks and ridges are acceptable. Use above suspended ceilings and within other concealed spaces if the gypsum board assembly is fire rated, sound rated, sound or smoke controlled, or the space serves as an air plenum.
 - .3 Level 2: At joints and interior angles embed tape in joint compound with one separate coat of joint compound applied over joints, angles, fastener heads, and accessories. Use for water resistant gypsum board indicated for use as a substrate for ceramic tile.
 - .4 Level 3: At joints and interior angles embed tape in joint compound with two separate coats of joint compound applied over all joints, angles, fastener heads, and accessories. Apply joint compound smooth and free of tool marks and ridges. Use where heavy grade wall coverings are the final decoration.
 - .5 Level 4: At joints and interior angles embed tape in joint compound with three separate coats of joint compound applied over all joints, angles, fastener heads, and accessories. Apply joint compound smooth and free of tool marks and ridges. Use for all locations except those indicated for other finish levels.
 - .6 Level 5: At joints and interior angles embed tape in joint compound with three separate coats of joint compound applied over all joints, angles, fastener heads, and accessories. Apply a thin skim coat of joint compound, or a material manufactured especially for this purpose, to the entire surface. Leave surface smooth and free of tool marks and ridges. Use where semi-gloss or gloss finish coatings are the final decoration.

3.10 **ACCESS DOORS**

- .1 Install access doors, supplied as part of other parts of the work, in accordance with manufacturer's written instructions.

3.11 **SITE TOLERANCES**

- .1 Install metal support systems to ensure that, within a tolerance of +3 mm and -1.5 mm for plaster thickness, finish surfaces will be flat within three (3) mm under a three (3) m straightedge, and with no variation greater than 1.5 mm in any running 300 mm, and that surface planes shall be within three (3) mm of dimensioned location.

3.12 **WORK IN EXISTING AREAS**

- .1 In existing areas, where existing gypsum board work has been demolished and/or damaged and repair work is required, provide new gypsum board finish.
- .2 Thoroughly prepare areas to be repaired. Provide neat, clean and straight cuts.
- .3 Finish all repair work as specified for new work.
- .4 In existing areas where existing openings are to be filled in with gypsum board, provide new gypsum board wall and ceiling construction. Ensure new board faces are flush with faces of abutting existing walls and ceilings.

3.13 **REPAIR**

- .1 Make good cut-outs for services and other work, fill in defective joints, holes and other depressions with joint compound.
- .2 Make good defective work, and ensure that surfaces are smooth, evenly textured and within specified tolerances to receive finish treatments.

END OF SECTION

- 1 General
- 1.1 **SECTION INCLUDES**
 - .1 Labour, Products, equipment and services necessary for tile work in accordance with the Contract Documents.
- 1.2 **REFERENCES**
 - .1 ANSI A108/A118/A136.1, Installation of Ceramic Tile.
 - .2 ANSI A137.1, Specifications for Ceramic Tile.
 - .3 ASTM C144, Specification for Aggregate for Masonry Mortar.
 - .4 ASTM C920, Specification for Elastomeric Joint Sealants.
 - .5 CAN/CSA A3000, Cementitious Materials Compendium.
 - .6 TTMAC Specification Guide 09 30 00 Tile Installation Manual.
 - .7 TTMAC, Maintenance Guide.
- 1.3 **SUBMITTALS**
 - .1 Product data:
 - .1 Submit copies of manufacturer's Product data in accordance with Section 01 30 00 indicating:
 - .1 Performance criteria, compliance with appropriate reference standard, characteristics, limitations and warranties.
 - .2 Product transportation, storage, handling and installation requirements.
 - .2 Shop drawings:
 - .1 Submit shop drawings in accordance with Section 01 30 00 indicating:
 - .1 Tile layout, patterns, and colour arrangement.
 - .2 Perimeter conditions, junctions with dissimilar materials.
 - .3 Setting details.
 - .3 Samples:
 - .1 Submit following sample panels in accordance with Section 01 30 00.
 - .1 Each colour, texture, size, and pattern of tile.
 - .2 Adhere tile samples to 400 x 400 x 12.5 mm thick board complete with selected grout colour in joints.

- .4 Certificates: Submit manufacturer's certificates stating that materials supplied are in accordance with this specification.
- .5 Extended warranty: Submit extended warranty signed and registered by the manufacturer providing the warranty in the name of the Owner for the timeframe and coverage specified in this Section.
- .6 Closeout submittals: Submit recommended maintenance instructions and listing of recommended maintenance Products for incorporation into Operations and Maintenance Manuals in accordance with Section 01 78 00.

1.4 **QUALITY ASSURANCE**

- .1 Perform work of this Section by a company that is a member in good standing of the Terrazzo Tile and Marble Association of Canada with proven, acceptable experience on installations of similar complexity and scope.
- .2 Mock-up:
 - .1 Construct one 3 m² mock-up of tile flooring including one inside corner and one outside corner in location acceptable to Consultant.
 - .2 Arrange for Consultant's review and acceptance, allow 48 hours after acceptance before proceeding with work.
 - .3 Mock-up may remain as part of Work if accepted by Consultant. Remove and dispose of mock-ups which do not form part of Work.

1.5 **DELIVERY, STORAGE AND HANDLING**

- .1 Deliver materials in adequate crates or containers with manufacturer's name and product description clearly marked.
- .2 Handle and store tiles in a manner to avoid chipping, breakage or the instruction of foreign matter. Take precautions to protect the mortar and grout admixtures from freezing or from excessive heat.

1.6 **SITE CONDITIONS**

- .1 Do not install work of this Section outside of the following environmental ranges without the Consultant's and Product manufacturer's written acceptance:
 - .1 Ambient air and surface temperature: 15^oC to 45^oC.
 - .2 Precipitation: None.
- .2 Install temporary protection and facilities to maintain the Product manufacturer's, and specified, environmental requirements for seven (7) Days before, during, and seven (7) Days after installation.

1.7 **MAINTENANCE**

- .1 Submit extra tile amounting to 3% of gross area covered, allowing proportionately for each pattern and type specified and which are part of the same Production run as installed Products. Store maintenance Products as directed by the Consultant.

2 Products

2.1 **MATERIALS**

- .1 General: All materials under work of this Section, including but not limited to, sealants, adhesives, and sealers are to have low VOC content limits.
- .2 Floor and Wall Tiles (T-1, W1):
 - .1 To CAN/CGSB-75.1-M.
 - .2 Supply coves, caps, inside and outside corners and bullnose tile as required.
 - .3 Where unfinished tile edge is exposed, supply cap to Consultant's selection.
 - .4 Floor and Wall Tiles (T-1, W1): Styles, size, colour and location in accordance with Section 09 06 00 Product Finish Schedule.
- .3 Tile Base: Base tile to match floor tile.

2.2 **ACCESSORIES**

- .1 Metal trims and caps (DM-1, DM-2): Refer to Section 09 06 00 Product Finish Schedule for Metal trims by Schluter or approved equivalent. Profiles, materials and finish as indicated on Product Finish Schedule.
- .2 Cement: CAN/CSA A3000, Type GU.
- .3 Sand: ASTM C144.
- .4 Water: Potable and free of minerals and other contaminants which are detrimental to mortar and grout mixes.
- .5 Flexible thin-set mortar: ANSI A108/A118/A136.1; ServoStar 3000 Flex White by Kiesel or approved equivalent.
- .6 Medium bed mortar: to ANSI A118.4; Servoflex-Trio-schnell SuperTec by Kiesel or approved equivalent.
- .7 Thick bed sloped topping: Factory mixed blend of portland cement and aggregates with latex admix. as manufactured by Kiesel or approved equivalent.
- .8 Primer: To meet specified requirements of adhesive manufacturer.
- .9 Cleaner: In accordance with TTMAC's requirements and as recommended by tile manufacturer.
- .10 Grout:
 - .1 Joint widths 1 mm - 10 mm for walls and floors: Fast-setting, flexible, water and dirt repellent grout; Servoperl Royal Schnell by Kiesel or approved equivalent.
 - .2 Joint widths 3 mm - 25 mm for walls and floors: Universal flexible sanded grout; Servoflex F by Kiesel or approved equivalent.

- .3 Grout colour: To be selected by the Consultant from the manufacturer's full colour range.
- .11 Joint backing: Round, closed cell, foam rod, oversized by 30% to 50%, Shore A hardness of 20, tensile strength 140 to 200 kPa.
- .12 Sealer: CAN/CGSB-25.20, penetrating, type as recommended by tile manufacturer.
- .13 Tile sealant: In accordance with Section 07 92 00.

2.3 MIXES

- .1 Levelling bed mix:
 - .1 1 part Portland cement.
 - .2 4 parts sand.
 - .3 1 part water (including polymer additive), adjusted for water content of sand.
 - .4 1/10 part polymer additive.

3 Execution

3.1 SURFACE PREPARATION

- .1 Clean and dry surfaces thoroughly. Remove oil, wax, grease, dust, dirt, paint, tar, primers, form release agents, curing compound, and other foreign material from substrate surfaces which may prevent or reduce adhesion.
- .2 Neutralize any trace of strong acids or alkali from the substrate.

3.2 CONTROL JOINTS

- .1 Provide control, expansion and isolation joints in accordance with TTMAC specification 301MJ and as indicated on drawings. Install in locations indicated on drawings and specified herein.
- .2 Continue control, construction, and cold joints in the structural substrate up through the tile finish, and align with mortar joints where possible. Review joint locations on Site with the Consultant.
- .3 Install joint widths to match grout joint widths, except where a minimum width is indicated.
- .4 Install control joints in the following typical locations:
 - .1 Aligned over changes in type of substrate.
 - .2 At the restraining perimeters such as walls and columns.
 - .3 Interior areas (not subject to sunlight): Six (6) mm minimum width, at 7320 mm o.c. maximum.
 - .4 Interior areas (subject to sunlight): Six (6) mm minimum width, at 3660 mm o.c. maximum.
 - .5 As indicated on the Contract Drawings.

- .5 Seal control joints in accordance with Section 07 92 00.

3.3 **LEVELLING BED**

- .1 Install a levelling bed on uneven substrate surfaces, level and plumb substrates in accordance with the following tolerances:
 - .1 Vertical surfaces: Three (3) mm in 2.4 m maximum .
 - .2 Horizontal surfaces: Six (6) mm in three (3) m from finished levels of the surface, or better.
- .2 Clean structural substrate control joints and blow-clean with compressed air. Grout fill control joints flush to slab with levelling bed.
- .3 Provide slopes to drains in washrooms and as indicated on drawings.

3.4 **GENERAL INSTALLATION REQUIREMENTS**

- .1 Install tiles in accordance with manufacturer's instructions and TTMAC Specification Guide 09300 Tile Installation Manual. Manufacturer's installation instructions govern over TTMAC Installation Manual.
- .2 Lay out Work to produce a symmetrical pattern with minimum amount of cutting. Ensure cut tile at room perimeter and at joints is not less than ½ full size.
- .3 Install trim to be placed under tile in locations indicated on Drawings.
- .4 Set tiles in place and rap or beat with a beating block as necessary to ensure a proper bond and to level surface. Align tile for uniform joints and allow to set until firm. Clean excess mortar from surface of tile with a wet cloth or sponge while mortar is fresh.
- .5 Ensure following minimum mortar contact coverage to back of tiles. Contact must be evenly distributed to give full support of the tile.
 - .1 98% for large format (305 mm x 305 mm or greater) interior applications.
 - .2 90% for non-large format interior applications.
- .6 Adjust joints between units uniform, plumb, straight, even, and true, with adjacent tile flush. Align grout joints in both directions unless indicated otherwise.
- .7 Align floor and base grout joints.
- .8 Install tile accessory fittings for a complete and fully coordinated tile assembly.
- .9 Do not place tile, trim, and accessories over control, expansion, or isolation joints. Stop materials in either side on joints and provide control, expansion and isolation joints as specified.

- .10 Cut and fit tile neatly around piping, fittings, joints, projections and around recesses items e.g. washroom accessories. Where surface mounted equipment and accessories are installed on tile surfaces, extend tile over surfaces. Cut edges smooth, even, and free from chipping; chipped and broken edges are not acceptable.
- .11 Do not proceed with grouting until minimum 48 hours after tile has set, to prevent displacement of tiles.
- .12 Apply grout in accordance with grout manufacturer's directions to produce watertight, filled joints without voids, cracks and excess grout. Thoroughly compact and tool floor grout. Finish grout flush to edge thickness of tile and remove excess grout with soft burlap or sponge moistened with clean water.

3.5 **CLEANING**

- .1 Clean off excess grout with soft burlap or sponge moistened with clean water.
- .2 Polish tile after grout has cured in accordance with TTMAC recommendations in the Maintenance Guide; do not use acid for cleaning.
- .3 Apply 2 coats of sealer to unglazed floor tile in accordance with sealer manufacturer's printed directions.
- .4 Re-point joints after cleaning as required to eliminate imperfections, then re-clean as necessary. Avoid scratching tile surfaces.

3.6 **JOINT BACKING AND TILE SEALANT**

- .1 Install joint backing under sealant as necessary.
- .2 Install tile sealant around piping and fittings extending through tiled surfaces.
- .3 Seal tile control joints.
- .4 Seal internal tile to tile junctions. Tool to a smooth, flush surface, free from air bubbles and contamination.

3.7 **PROTECTION**

- .1 Prevent traffic over tiled areas, and protect tiled assemblies from weather, freezing, and water immersion, for 72 hours minimum, after final installation.
- .2 Prevent direct impact, vibration and heavy hammering on adjacent and opposite walls for 24 hours minimum, after final installation.

- .3 Cover work temporarily with building paper properly lapped and taped at joints until work has been approved by Consultant.

END OF SECTION

1 General

1.1 **SECTION INCLUDES**

- .1 Design, labour, Products, equipment and services necessary for acoustical ceilings work in accordance with the Contract Documents.

1.2 **REFERENCES**

- .1 ASTM A653/A653M, Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvanealed) by the Hot-Dip Process.
- .2 ASTM C635, Specification for the Manufacture, Performance, and Testing of Metal Suspension Systems for Acoustical Tile and Lay-in Panel Ceilings.
- .3 ASTM C636, Practice for Installation of Metal Ceiling Suspension Systems for Acoustical Tile and Lay-in Panels.
- .4 ASTM C645, Specification for Non-Load Bearing (Axial) Steel Studs, Runners (Tracks), and Rigid Furring Channels for Screw Application of Gypsum Board.
- .5 ASTM E1264, Classification for Acoustical Ceiling Products.

1.3 **DESIGN REQUIREMENTS**

- .1 Design ceiling suspension systems in accordance with ASTM C636 and manufacturer's printed directions.
- .2 Design tile ceiling system for adequate support of electrical fixtures as required by the current bulletin of the Electrical Safety Authority. Acoustic panel system is not designed to carry the weight of electrical equipment.
- .3 Design hanger anchor and entire suspension system static loading not to exceed 25% of their ultimate capacity including lighting fixture dead loads.
- .4 Design tile suspension system to support weight of mechanical and electrical items such as air handling boots and lighting fixtures, and with adequate support to allow rotation/relocation of light fixtures. Acoustic panel system is not designed to carry the weight of mechanical and electrical equipment.
- .5 Design subframing as necessary to accommodate, to avoid conflicts and interferences where ducts or equipment prevent regular spacing of hangers.

1.4 **SUBMITTALS**

- .1 Shop drawings:
.1 Submit shop drawings in accordance with Section 01 30 00 indicating:
.1 Suspension system layout including hangers and supports for acoustic tile system.

- .2 Acoustic panel system including suspension system, hangers, supports and panel sizes and locations.
 - .3 Conditions at abutting, intersecting, and penetrating construction.
 - .4 Dimensioned locations of lighting fixtures, diffusers, sprinkler heads and other items that pierce the ceiling plane.
- .2 Samples:
- .1 Submit following samples in accordance with the Conditions of the Contract:
 - .1 One full-size sample of each type of tile panels to be used.
 - .2 One of each type of suspension system members.
 - .3 Certificates: Submit written certification stating that suspended ceiling system is designed for adequate support of electrical fixtures as required by the current bulletin of the Electrical Safety Authority.

1.5 **QUALITY ASSURANCE**

- .1 Mock-up:
- .1 Construct one 3 m² mock-up for each type of ceiling system incorporating typical light fixture and other typical mechanical and electrical fixtures.
 - .2 Test the adequacy of the suspension system to support the fixtures without deflection of ceiling or failure of hanging wire anchorage. Supply copy of Test Results to Consultant.
 - .3 Change materials and installation methods if tests indicate proposed system is inadequate and re-test as necessary until system approved.
 - .4 Give early notice to Consultant and Mechanical and Electrical Trades and cooperate with them in selecting suitable location for sample ceiling and timing of installation and test.
 - .5 Do not commence general installation work until sample ceiling approved, then install ceiling to conform with approved samples.
 - .6 Mock-up may form part of final Work, if acceptable to Consultant. Remove and dispose of mock-ups which do not form part of Work.

1.6 **SITE CONDITIONS**

- .1 Do not install the work of this Section until:
- .1 Mechanical and electrical work above the ceiling is complete.
 - .2 Relative humidity is below 80 %.
 - .3 Ventilation is adequate to remove excess moisture.
 - .4 Areas are closed and protected against weather, and maintained at no less than 10°C.
- .2 Install temporary protection and facilities to maintain Product manufacturer's, and above specification, environmental requirements 24 h before, during, and after installation.

1.7 **MAINTENANCE**

- .1 Submit extra acoustic ceilings amounting to 2% of gross ceiling area, allowing proportionately for each pattern and type specified to nearest full carton. Submit Products which are part of same production run as installed Products. Store maintenance Products as directed by Consultant.

1.8 **DELIVERY, STORAGE AND HANDLING**

- .1 Transport, handle and store material in manner to prevent warp, twist, damage to panel edges and surfaces in accordance with Manufacturer's recommendations.
- .2 Any warped and/or damaged panels and trim shall be rejected and be replaced by new, straight, undamaged and acceptable material at no cost to Owner.
- .3 Bent, twisted or otherwise damaged Tee grid suspension components shall not be used under any circumstances. Replace such damaged items with new undamaged material at no additional cost to Owner.
- .4 Store material in warm, dry place away from water and the elements. Protect against undue loading stresses and shock.
- .5 All packaged material shall be delivered in original manufacturers wrappers and containers with labels and seals intact. All cartons shall bear U.L. label.

2 Products

2.1 **MATERIALS**

- .1 Galvanized steel sheet: ASTM A653/A653-M, Z275; cold rolled, galvanized steel sheet.
- .2 Main carrying channels: ASTM C645; Channels formed from galvanized steel sheet, 38 x 19 mm cold rolled.
- .3 Subframing: ASTM C645; Channels formed from galvanized steel sheet, dimensions and spans as required.
- .4 Hangers: 2.6 mm minimum diameter, galvanized steel wire.
- .5 Tie wire: 1.6 mm minimum diameter, soft annealed galvanized steel wire.
- .6 Concrete anchors: tie wire sleeve anchors, 'Redi-Drive Anchors' by ITW Red Head or approved alternative.
- .7 Wall mouldings and accessories, including but not limited to, corner caps, edge mouldings, panel hold over clip, metal closures, and trim. Finish and colour: same as main tees.

- .8 Exposed main, cross tees, and relocatable cross tees: ASTM C635, 38 mm high steel, bulb tee design double steel web, rectangular single spans without exceeding a deflection of 1/360 of the span. Splices to be integral and reversible; cross tee interlocking into main tee. Colour and finish: Manufacturer's standard white.
 - .1 Suspension system: CGC Inc, or approved alternative.
- .9 Acoustical ceiling (ACT-#): Refer to Section 09 06 00 Product Finish Schedule for all acoustical ceiling types.
- .10 Wall mouldings: To match acoustical ceiling suspension system.

3 Execution

3.1 EXAMINATION

- .1 Verify condition and dimensions of previously installed Work upon which this Section depends. Report defects to Consultant. Commencement of work of this Section means acceptance of existing conditions.

3.2 SUSPENSION SYSTEM

- .1 Coordinate locations and openings of mechanical and electrical services support, and penetration through the acoustical ceilings. Coordinate field conditions, clearances, measurements, and mechanical and electrical services testing and commissioning, above the acoustical ceilings.
- .2 Install hanger wires plumb and securely anchored to the building structural framing, independent of walls, pipes, ducts, and metal deck; install additional framing and hangers to bridge interference items.
- .3 Install acoustical ceiling systems in accordance with manufacturer's written instructions, reviewed shop drawings, and ASTM C636, listed in order of precedence.
- .4 Install hanger wires at 1200 mm maximum centres along carrying channels, not less than 25 mm, and not more than 150 mm from channel ends.
- .5 Install additional hangers at lighting fixture and air distribution ductwork locations. Do not attach hanger wires to mechanical or electrical equipment. Do not support mechanical and electrical fixtures and fitting on ceiling without the ceiling manufacturer's written acceptance.
- .6 Install acoustical ceiling suspension system to a tolerance of 1:1200 of span and 0.4 mm maximum between adjacent metal members. Tolerances are not cumulative. Refer to Electrical Contract Drawings for fixture layout.
- .7 Do not bend or twist hangers as a means of levelling. Form double loops tightly and lock to prevent vertical movement or rotation within the loop.
- .8 Install edge moulding at intersection of ceiling and vertical surfaces.

- .9 Centre acoustical ceiling suspension systems on room axis; install equal border pieces. Install hangers onto the ends of main tee runners at not more than 150 mm from ends of runners, adjacent and perpendicular to walls.
- .10 Support the suspension system independently of walls, columns, ducts, pipes and conduits.
- .11 Install main runners in maximum available lengths. Layout joints in suspension members to avoid the perimeters of recessed fixtures. Lock grid members to form a rigid assembly. Install additional tee, suspension system framing around recessed fixtures, diffusers, grilles and other items for a complete assembly.

3.3 **ACOUSTIC LAY-IN TILES**

- .1 Install acoustic tile in grid system openings supported by bottom flanges of members. Provide special shapes and sizes to provide a complete installation by cutting tile to fit into openings. Fit tile moderately tight between upright legs of members.
- .2 Carefully cut and trim acoustic tiles to accommodate items piercing the finished ceiling plane.
- .3 Remove and replace acoustic tiles with broken edges, or damaged, marked, discoloured, soiled, or stained faces.

3.4 **ADJUSTMENTS AND CLEANING**

- .1 Clean soiled or discoloured surfaces of exposed work on completion of work.
- .2 Replace components which are visibly damaged, marred or uncleanable.

END OF SECTION

-
- 1 General
- 1.1 **SECTION INCLUDES**
- .1 Labour, Products, equipment and services necessary for resilient base work and accessories in accordance with the Contract Documents.
- 1.2 **REFERENCES**
- .1 ASTM F1861, Specification for Resilient Wall Base.
- 1.3 **SUBMITTALS**
- .1 Product data:
- .1.1 Submit copies of manufacturer's Product data in accordance with Section 01 30 00 indicating:
- .1.1 Performance criteria, compliance with appropriate reference standard, characteristics, limitations.
- .1.2 Product transportation, storage, handling and installation requirements.
- .2 Samples: Submit two 250 mm long samples of resilient base in accordance with Section 01 30 00.
- .3 Closeout submittals: Submit maintenance and cleaning data for incorporation into Operations and Maintenance Manuals in accordance with Section 01 78 00.
- 1.4 **SITE CONDITIONS**
- .1 Maintain air temperature and structural base temperature at installation area above 20°C for 48 hr before, during and 48 hr after installation.
- .2 Store materials for 2 days prior to installation in area of work to achieve temperature stability.
- .3 Do not install base in conditions of high humidity or where exposed to cold drafts. In hot weather, protect from direct sunlight.
- .4 Provide adequate ventilation during installation.
- 1.5 **MAINTENANCE**
- .1 Submit extra 5% or to nearest full roll of each colour, pattern and type of base required for maintenance use. Identify each carton. Store where directed.

2 Products

2.1 **MATERIALS**

- .1 All materials under work of this Section, including but not limited to, primers, and adhesives are to have low VOC content limits.
- .2 Rubber base (RB-#): ASTM F1861, Refer to Section 09 06 00 Product Finish Schedule.
- .3 Metal trims and caps (DM-#): Metal trims with trapezoid anchoring leg by Schluter or approved alternative. Profiles, materials and finish in accordance with Section 09 06 00 Product Finish Schedule.
- .4 Reducing edge strips, transition strips, thresholds and accessories: To be selected by Consultant.
- .5 Primers and adhesives: Low VOC, waterproof, recommended by base manufacturer for specific material on applicable substrate, above, at or below grade.

3 Execution

3.1 **EXAMINATION**

- .1 Verify condition and dimensions of previously installed Work upon which this Section depends. Report defects to Consultant. Commencement of work of this Section means acceptance of existing conditions.
- .2 Defective work resulting from application to unsatisfactory surfaces will be considered the responsibility of those performing the work of this Section.

3.2 **RESILIENT BASE APPLICATION**

- .1 Install resilient base in accordance with manufacturer's written instructions.
- .2 Lay out base to keep number of joints at minimum.
- .3 Prior to installing base, fill cracks and irregularities with a filler recommended by base manufacturer.
- .4 Set base in adhesive using a 3 kg hand roller, against wall and floor surfaces.
- .5 Install straight and level to variation of 1:1000.
- .6 Scribe and fit to door frames and other obstructions.
- .7 Cope internal corners.

3.3 **CLEANING**

- .1 Forty-eight hours after installation, clean resilient base surfaces with a mild soap solution approved by finish manufacturer.

END OF SECTION

1 General

1.1 **SECTION INCLUDES**

- .1 Labour, Products, equipment and services necessary for resilient tile flooring Work and accessories in accordance with the Contract Documents.

1.2 **REFERENCES**

- .1 ASTM F710, Standard Practice for Preparing Concrete Floors to Receive Resilient Flooring.
- .2 ASTM F1066, Specification for Vinyl Composition Floor Tile.
- .3 ASTM F1869, Standard Test Method for Measuring Moisture Vapor Emission Rate of Concrete Subfloor Using Anhydrous Calcium Chloride.
- .4 ASTM F 2170, Standard Test Method for Determining Relative Humidity in Concrete Slabs Using in-situ Probes.

1.3 **SUBMITTALS**

- .1 Product data:
 - .1 Submit copies of manufacturer's Product data in accordance with Section 01 30 00 indicating:
 - .1 Performance criteria, compliance with appropriate reference standard, characteristics, limitations.
 - .2 Product transportation, storage, handling and installation requirements.
 - .2 Samples:
 - .1 Submit following samples in accordance with Section 01 30 00:
 - .1 Two 250 x 200 mm samples of each type of tile material and colour.
 - .2 Two 250 mm long samples of each accessory and colour.
- .3 Closeout submittals: Submit maintenance and cleaning data for incorporation into Operations and Maintenance Manuals in accordance with Section 01 78 00.

1.4 **SITE CONDITIONS**

- .1 Maintain air temperature and structural base temperature at flooring installation area above 20°C for 48 hr before, during and 48 hr after installation.
- .2 Store materials for 2 days prior to installation in area of Work to achieve temperature stability.
- .3 Do not lay flooring in conditions of high humidity or where exposed to cold drafts. In hot weather, protect from direct sunlight.
- .4 Provide adequate ventilation during installation.

- .5 Ensure concrete floors meet the minimum requirements of the flooring manufacturer. Do not proceed with placement of the adhesive and resilient flooring until surfaces and conditions comply with the manufacturers requirements indicated in each of the manufacturers' instructions and good work practices. Adhesive and Resilient Flooring Manufacturers to provide their acceptance in writing to Contractor, Consultant, and Owner that the conditions are acceptable for installation.

1.5 MAINTENANCE

- .1 Submit extra 5% or to nearest full carton of each colour, pattern and type of flooring material required for maintenance use. Identify each carton. Store where directed.

2 Products

2.1 MATERIALS

- .1 All materials under Work of this Section, including but not limited to, primers, adhesives, sealers, and waxes are to have low VOC content limits.
- .2 Vinyl Composite Tile (VCT-1): Refer to Section 09 06 00 Product Finish Schedule for types and colours.
- .3 Base: in accordance with Section 09 65 00.
- .4 Accessories and wheel transition strips: PVC, conforming to NFPA 101, colour and accessory type selected by Consultant from manufacturer's full range; 'Specialty Floor Finishing Accessories' by Tarkett. Adhesive recommended by Accessories manufacturer.
- .5 Primers and adhesives: Low VOC, waterproof, recommended by flooring manufacturer for specific material on applicable substrate, above, at or below grade.
- .6 Concrete skim coat compound: High-performance, rapid-setting cement based skim coating compound. 'Ultra SkimCoat' by Mapei or approved alternative for filling minor voids and leveling existing substrate.
- .7 Sealer and wax: Type recommended by flooring manufacturer.

3 Execution

3.1 EXAMINATION

- .1 Verify condition and dimensions of previously installed Work upon which this Section depends. Report defects to Consultant. Commencement of work of this Section means acceptance of existing conditions.

- .2 Ensure concrete floors meet the following minimum requirements and requirements of the flooring manufacturer. If there is a conflict between these requirements and those of the flooring manufacturer, the more stringent shall apply.
 - .1 Internal Relative Humidity Test: Perform internal relative humidity testing in accordance with ASTM F2170. Results shall not exceed 80% RH.
 - .2 Moisture Test: Moisture emissions from concrete subfloors (cured for a minimum of 28 days) must not exceed 3 lbs per 1000sf per 24 hours (1.4 kg H₂O/24 hr/93 m²) for acrylic adhesive and 5lbs for polyurethane adhesive via the Calcium Chloride Test Method (ASTM F1869).
 - .3 The pH level of the subfloor surface shall not be higher than 9.9. If higher, subfloor must be neutralized.
- .3 Ensure that sub-floors have been provided as specified without holes, protrusions, cracks, depressions or other major defects.
- .4 Ensure that control joints have been filled and levelled.
- .5 Defective work resulting from application to unsatisfactory surfaces will be considered the responsibility of those performing the work of this Section.

3.2 **SUBFLOOR TREATMENT**

- .1 Flooring shall be installed over subfloors conforming to ASTM F710 for concrete.
- .2 Remove sub-floor ridges and bumps. Fill low spots, cracks, joints, holes and other defects with sub-floor filler.
- .3 Apply sub-floor filler to low spots and cracks to achieve floor level to a tolerance of 1:1000, allow to cure.
- .4 Meet ASTM F710 Standard for Concrete or other monolithic floors.
- .5 Clean and remove all deleterious materials from surfaces to receive this work in accordance with the adhesive manufacturer's recommendations.
- .6 Prime concrete to flooring manufacturer's printed instructions.

3.3 **RESILIENT TILE FLOORING APPLICATION**

- .1 Install resilient tile flooring in accordance with manufacturer's written instructions.
- .2 Apply adhesive uniformly using recommended trowel in accordance with flooring manufacturer's instructions. Do not spread more adhesive that can be covered by flooring before initial set takes place.
- .3 Lay flooring with joints straight and parallel to building lines to produce symmetrical tile pattern. Install equal size perimeter tile on each side.
- .4 Install flooring to square grid pattern with all joints aligned.

- .5 As installation progresses, and after installation, roll flooring in 2 directions with minimum 45 kg minimum roller to ensure full adhesion.
- .6 Remove adhesive seepage at seams or surface while adhesive is still wet, in accordance with manufacturer's recommendation.
- .7 Cut tile and fit neatly around fixed objects.
- .8 Install feature strips and floor markings where indicated. Fit joints tightly.
- .9 Terminate flooring at centerline of door in openings where adjacent floor finish or colour is dissimilar.
- .10 Install reducing edge strips at unprotected or exposed edges where flooring terminates and at edges where there are two finishes of different thicknesses.

3.4 **RESILIENT BASE APPLICATION**

- .1 Install resilient base in accordance with Section 09 65 00.

3.5 **ACCESSORIES AND WHEELED TRANSITION APPLICATION**

- .1 Install accepted adaptors between different flooring materials in accordance with manufacturer's instructions.
- .2 Ensure that adaptors have been clipped into place properly to provide a smooth, gradual transition between floors of different height.
- .3 Install accessories in accordance with manufacturer's written instructions.

3.6 **CLEANING AND WAXING**

- .1 Forty-eight hours after installation, clean vinyl tile surfaces with a mild soap solution approved by finish manufacturer. Rinse clean, dry and apply 2 coats of wax. Polish thoroughly.

3.7 **PROTECTION OF FINISHED WORK**

- .1 Protect floors from time of final set of adhesive until final waxing.
- .2 Prohibit traffic on floor for 48 hours after installation.
- .3 Cover waxed and polished surfaces with fibre reinforced, clean, non-staining kraft paper. Secure in position with gummed tape to prevent drifting. Remove covering when directed by Consultant.

END OF SECTION

- 1 General
- 1.1 **SECTION INCLUDES**
 - .1 Labour, Products, equipment and services necessary for painting work in accordance with the Contract Documents.
- 1.2 **REFERENCES**
 - .1 Master Painters Institute (MPI), Painting Specification Manual.
 - .2 SSPC Steel Structures Painting Council, Standards.
- 1.3 **SUBMITTALS**
 - .1 Product data:
 - .1 Submit copies of manufacturer's Product data in accordance with Section 1 30 00 indicating:
 - .1 Performance criteria, compliance with appropriate reference standard, characteristics, limitations.
 - .2 Product transportation, storage, handling and installation requirements.
 - .2 Submit listing of manufacturer's Product types, Product codes, and Product names, number of coats, and dry film thicknesses, corresponding to each Painting Schedule code; submit listing minimum of eight (8) weeks before materials are required.
 - .2 Samples:
 - .1 Submit following samples in accordance with Section 1 30 00.
 - .1 Three 300 x 150 mm draw downs of each colour minimum four (4) weeks before paints are required.
 - .2 Identify each sample with Contract number and title, colour reference, sheen, date, and name of applicator.
 - .3 Certificates:
 - .1 Submit certification from paint manufacturer, on company letterhead, indicating each product proposed for use is Manufacture's premium grade, first line Product.
 - .2 Submit certified documentation to confirm each airless spray painter has minimum of 5 years experience on applications of similar complexity and scope.
 - .3 Submit certified documentation to confirm each worker has Provincial Tradesman Qualification certificate of proficiency.
 - .4 Reports:
 - .1 Submit written field inspection and test report results after each inspection.
 - .2 Submit Field Quality Control test result reports for alkali content, substrate moisture, and dry film thickness.
 - .3 Submit electronic moisture meter manufacturer's specifications including tolerances. Submit record of latest meter calibration to meet manufacturer's recommendations.

1.4 QUALITY ASSURANCE

- .1 Finishing work: Perform work to MPI requirements for premium grade.
- .2 Supervision: Have work supervised by a full-time qualified foreperson who has ten (10) years minimum experience on Contracts of similar complexity and scope.
- .3 Mock-up:
 - .1 Construct three (3) m² mock-ups of different Paint Schedule code systems, selected by Consultant, in locations acceptable to Consultant to demonstrate installation workmanship, colour, and hiding power of Products.
 - .2 Obtain Consultant's acceptance in writing before proceeding with the work of this Section.
 - .3 Mock-ups may remain as part of the Work if acceptable to Consultant and will serve as a standard for similar code systems.
 - .4 Repaint over mock-ups which do not form part of the Work.

1.5 DELIVERY, STORAGE, AND HANDLING

- .1 Install correct, safe temporary storage for paint, thinner, solvents, and other volatile, corrosive, hazardous, and explosive materials in accordance with requirements of authorities having jurisdiction.
- .2 Post hazard warning signage in areas of storage and mixing. Install and maintain sufficient CO₂ fire extinguishers of minimum nine (9) kg capacity, accessible in each storage mixing and storage areas.
- .3 Maintain storage enclosures at minimum 10°C ambient temperature and to manufacturer's instructions.

1.6 SITE CONDITIONS

- .1 Apply coatings under the following conditions:
 - .1 Exterior coatings (except Latex): 5° C minimum.
 - .2 Exterior latex coatings: 10°C minimum.
 - .3 24 hours minimum after rain, frost, condensation, or dew.
 - .4 When no condensation is possible (unless specifically formulated against condensation).
 - .5 Interior coatings: 7°C minimum.
 - .6 Relative humidity: 85% maximum.
 - .7 Not in direct exposure to sun light.
- .2 Maintain temperature conditions indicated above for 24 hours before, during and 24 hours after painting.
- .3 Install clean plywood sheets to protect floors and walls in storage and mixing areas, from paint drips, spatters, and spills.

- .4 Apply sufficient masking, clean drop cloths, and protective coverings for full protection of work not being painted including, but not limited to, the following:
 - .1 Light fixtures, fire and smoke detectors.
 - .2 Data cabling and data infrastructure.
 - .3 Sprinkler heads.
 - .4 Prepainted diffusers and registers.
 - .5 Prepainted equipment.
 - .6 Fire rating labels and equipment specification plates.
 - .7 Finished surfaces.

1.7 ENVIRONMENTAL PERFORMANCE REQUIREMENTS

- 1. Provide paint products meeting MPI "Green Performance Standard GPS-1-12.

1.8 MAINTENANCE

- 1. Deliver to Owner's place of storage on completion of work, sealed containers of each finish painting material applied, and in each colour. Label each container as for original, including mixing formula. Provide the following:
 - .1 One (1) L of extra materials when less than 50 L are used for Project;
 - .2 3.78 L of extra stock when 50 to 200 L are used;
 - .3 7.57 L of extra stock when over 200 L are used.

2 Products

2.1 MATERIALS

- .1 (PT-1, PT-2):
 - .1 All materials under work of this Section, including but not limited to, primers, stains, and paints are to have low VOC content limits.
 - .2 Products in accordance with the MPI Painting Specification Manual, Exterior and Interior Systems;
 - .1 For each MPI paint code, manufacture's premium grade, first line Products is to be use.
 - .2 Uniform dispersion of pigment in a homogeneous mixture.
 - .3 Ready-mixed and tinted whenever possible.
 - .3 Products within each MPI paint system code: From single manufacturer.
 - .4 Acceptable manufacturers:
 - .1 AkzoNobel.
 - .2 Benjamin Moore.
 - .3 PPG Industries Inc.
 - .4 Sherwin Williams.
 - .5 Or approved equivalent.

2.2 COLOUR SCHEDULE

- .1 (PT-1, PT-2): Refer to Section 09 06 00 for Colour and Material Schedule for selected colour references.

- .2 Conform to gloss reflectance definitions listed in MPI Specification Manual.

2.3 PAINTING AND FINISHING SCHEDULE

- .1 Refer to Table 1, MPI Painting and Finishing Schedule coded systems, comply with MPI Painting Specification Manual.

Table 1: Painting and Finishing Schedule					
INTERIOR SUBSTRATES	Typical substrates (Including but not limited to)	MPI Manual Ref.	MPI Finish System		Topcoat
Concrete walls and ceilings		INT 3.1	INT 3.1A		Latex
Concrete floors		INT 3.2	INT 3.2C		Epoxy
Concrete block masonry		INT 4.2	INT 4.2A		Latex
Galvanized metal	HM doors & door frames	INT 5.3	INT 5.3B	Semi-Gloss	WB light industrial coating
Gypsum board	Drywall, walls, ceilings	INT 9.2	INT 9.2A	Eggshell	Latex
Gypsum board	Wet areas	INT 9.2	INT 9.2F	Semi-Gloss	Epoxy-modified latex
Gypsum Board	Ceilings	INT 9.2	INT 9.2A	Flat	Latex

3 Execution

3.1 EXAMINATION

- .1 Verify condition of previously installed Work upon which this Section depends. Report defects to Consultant. Commencement of work of this Section means acceptance of existing conditions.

3.2 PREPARATION

- .1 General:
 - .1 Clean substrate surfaces free from, dust, grease, soiling, or extraneous matter, which are detrimental to finish.
 - .2 Patch, repair, and smoothen minor substrate defects and deficiencies e.g. machine, tool and sand paper marks, shallow gouges, marks, and nibs.
 - .3 Clean, sweep, and vacuum floors and surfaces to be painted, debris and dust-free prior to painting.
 - .4 Refer to MPI Painting Specification Manual for surface preparation requirements of substrates not listed here.
- .2 Where finish hardware has been installed remove, store, re-install finish hardware, to accommodate painting. Do not clean hardware with solvent that will remove permanent lacquer finishes.
- .3 Alkali Content tests and neutralization:
 - .1 Test for ph level using litmus paper on dampened substrate.
 - .2 Neutralize surfaces over 8.5 ph with 4% solution of Zinc Sulphate for solvent based systems and tetrapotassium pyrophosphate for latex based systems, to below 8.0 ph, and allow to dry.
 - .3 Brush-off any residual Zinc Sulphate crystals.
 - .4 Coordinate paint system primer / sealer to be alkali-resistant.
- .4 Substrate moisture tests:
 - .1 Test for moisture content over entire surface to be painted, minimum one test/ two (2) m² in field areas and one test/600 mm along inside corners including at ceiling to wall juncture.
 - .2 If any test registers above 10% allow entire substrate surfaces, within the plane, to dry further before paint system application. Install temporary drying fans if necessary.
 - .3 Re-test employing same criteria.
- .5 Mildew removal: Scrub with solution of trisodium phosphate and sodium hypochlorite (Javex) bleach, rinse with water, and allow to dry completely.
- .6 Cementitious and masonry (existing): Clean existing surfaces by pressure washing where indicated on drawings with a TSP solution and pressure range of 1500 - 4000 PSI at 6 - 12". Rinse areas with clean water and allow to thoroughly dry. Provide for collection and disposal of water.
- .7 Masonry (Concrete, block):
 - .1 Allow 28 days cure before painting.
 - .2 Coordinate repair of protrusion-chipping and grinding, and honeycomb filling with responsible trades.
 - .3 Remove dirt, loose mortar, scale, powder, efflorescence, and other foreign matter.
 - .4 Remove form oil and grease with trisodium phosphate, rinse, and allow to dry thoroughly.

- .5 Remove rust stains with solution of sodium metasilicate after thorough wetting; allow to dry thoroughly.
- .8 Concrete floors (existing): Clean existing surfaces by pressure washing where indicated on drawings with a TSP solution and pressure range of 1500 - 4000 PSI at 6 - 12". Rinse areas with clean water and allow to thoroughly dry. Provide for collection and disposal of water.
- .9 Metal Fabrications (existing): Scrape and either hand or power wire brush surfaces to remove mill and scale.
- .10 Gypsum board (existing):
 - .1 Remove dust, dirt, oil, grease, glue and all foreign material. Clean with stiff fibre brush prior to applying primer coat.
 - .2 Coordinate repairs and touch-ups with the responsible trade.
 - .3 Lightly sand surface to smooth out ridges and provide neat smooth surface.
- .11 Gypsum board:
 - .1 Apply primer/sealer paint to reveal defects and deficiencies and to equalize absorption areas.
 - .2 Coordinate repairs and touch-ups with the responsible trade.
 - .3 Re-prime repairs.
- .12 Coordinate with other trades to prevent:
 - .1 Damage, and inadvertent activation of fire and smoke detectors.
 - .2 Odour and dust distribution by permanent HVAC systems including fouling of ducts and filters.
- .13 Field-mix Products in accordance with manufacturer's written instructions.

3.3 **APPLICATION**

- .1 Apply painting systems in accordance with the MPI Painting Specification Manual. Apply each Product to manufacturer's recommended dry film thickness.
- .2 Painting systems listed are required minima, apply additional coats if necessary to obtain substrate hiding acceptable to the Consultant.
- .3 Tint intermediate coats lighter than final top coats for identification of each succeeding coat and to facilitate inspections. Include only manufacturer's recommended reducing and tinting accessories. Do not add adulterants.
- .4 Primer to be specialized primer coating system as required by manufacturer for selected colour. Standard primer being tinted shall be tinted to a maximum of 1.5% by volume.
- .5 Sand lightly between coats to achieve a tooth or anchor for subsequent coats.

- .6 Apply paint uniformly in thickness, colour, texture, and gloss, as determined by the Consultant under adequate illumination and viewed at a distance of 1500 mm. Apply finishes free of defects in materials and application which, in the opinion of the Consultant, affect appearance and performance. Defects include, but are not limited to:
 - .1 Improper cleaning and preparation of surfaces.
 - .2 Entrapped dust, dirt, rust.
 - .3 Alligating, blisters, peeling.
 - .4 Scratches, blemishes.
 - .5 Uneven coverage, misses, drips, runs, and poor cutting in.
- .7 Do not apply coatings on substrates which are not sufficiently dry. Unless indicated otherwise, allow each painting system coat to cure dry and hard before following coats are applied.
- .8 Repaint entire areas of damaged or incompletely covered surfaces, to the nearest inside or outside corner; patching will not be permitted.
- .9 Miscellaneous painting requirements:
 - .1 Paint projecting ledges, and tops, bottoms and sides of doors both above and below sight lines to match adjacent surfaces.
 - .2 Paint door frames, access doors and frames, door grilles, prime coated butts, and prime coated door closers to match surface in which they occur.
 - .3 Finish closets and alcoves as specified for adjoining rooms.
 - .4 Paint light coves white whether a light lense is installed or not, unless otherwise indicated.
 - .5 Paint interior columns to match walls of room.
 - .6 Allow for:
 - .1 2 wall colours per room, one ceiling colour per room.
 - .2 Different door colours in each functionally different area.
 - .3 Different colours on both sides of same door.
- .10 Mechanical, electrical and other painting coordination:
 - .1 Paint following items unless specified or indicated on drawings not to be painted.
 - .2 Paint mechanical services in accordance with Mechanical Identification Division 21, 22 and 23.
 - .3 Coordinate painting of pipes, ducts, and coverings with the work of Division 21, 22 and 23 to precede pipe colour banding, flow arrows, and other pipe identification labeling installation.
 - .4 Paint exposed conduit, pipes, hangers, ductwork, grilles, gratings, louvres, access panels, fire hose cabinets, registers, convector and radiator covers, enclosures, and other mechanical and electrical equipment including services concealed inside cupboard and cabinet work; apply colour and sheen to match adjacent surfaces, except as noted otherwise.
 - .5 Paint portions of surfaces such as duct interiors, piping, ductwork, hangers, insulation, walls, and similar items, visible through grilles, louvres, convector covers etc., matte black in colour.
 - .6 Remove the following to accommodate painting, carefully store, clean, then re-install on completion of each area and when dry:
 - .1 Switch and receptacle plates, fittings and fastenings, grilles, gratings, louvres, access panels, convector covers, and enclosures .

3.4 FIELD QUALITY CONTROL

- .1 Dry film thickness tests:
- .1 Test for film thickness over entire surface to be painted, minimum one test/2 m² in field areas and one test/600 mm along inside corners including at ceiling to wall juncture.
 - .2 If any test registers below specified thickness, re-apply paint to entire surface to nearest inside and outside corners.
 - .3 If test registers more than 50% above specified thickness, consult with paint manufacturer, determine if problem exists, offer solutions to Consultant, and repair as directed.
 - .4 Re-test employing same criteria after repair.

3.5 CLEANING

- .1 Remove spilled, splashed, and spattered paint promptly as work proceeds and on completion of work. Clean surfaces soiled by paint spillage and paint spatters. Repair or replace damaged work, as directed by Consultant.

3.6 PROTECTION

- .1 Post Wet Paint signs during drying and restrict or prevent traffic where necessary.
- .2 Post sign, after Consultant's inspection and acceptance of each room, reading: PAINTING COMPLETE - NO ADMITTANCE WITHOUT CONTRACTOR'S PERMISSION.

END OF SECTION

1 General

1.1 **SECTION INCLUDES**

- .1 Labour, Products, equipment and services necessary for compartments and cubicles Work in accordance with the Contract Documents.

1.2 **REFERENCES**

- .1 ASTM A167, Specification for Stainless Steel and Heat-Resisting Chromium-Nickel Steel Plate, Sheet, and Strip.
- .2 CAN/CSA B651-M, Accessible Design for the Built Environment.

1.3 **SUBMITTALS**

- .1 Shop drawings: Submit shop drawings in accordance with Section 01 30 00 indicating fabrication and erection details, plans, elevations, hardware, and installation details.
- .2 Samples:
 - .1 Submit samples in accordance with Section 01 30 00.
 - .1 Submit 300 x 300 mm samples for each colour.
 - .2 Submit samples of each hardware item, including brackets, fastenings, and trim.

1.4 **MAINTENANCE DATA**

- .1 Provide maintenance data for maintenance of finished work for incorporation into Maintenance Manual specified in Section 01 78 00.

1.5 **PROTECTION**

- .1 Cover finished surfaces with heavy Kraft paper or put in cartons during shipment. Protect installed surfaces by approved means. Do not remove until immediately prior to final inspection.

2 Products

2.1 **ACCEPTABLE MANUFACTURERS**

- .1 Phenolic Floor Mounted Overhead Braced: Refer to Section 09 06 00 Product Finish Schedule.

2.2 **MATERIALS**

- .1 All materials under Work of this Section, including but not limited to, adhesives are to have low VOC content limits.

- .2 Phenolic partitions: 19 mm thick consisting of multiple resin-impregnated kraft paper core with colour and clear melamine surface sheets, fused at high temperature. No brown core permitted. Refer to Room Finish and Colour Schedule for colours.
- .3 Hardware:
 - .1 Hinges: concealed, heavy duty aluminum or stainless steel casting, self-lubricating inward swing.
 - .2 Slide bolt and keeper: Aluminum or stainless steel casting or extrusion, equipped for emergency access.
 - .3 Door stop: Aluminum or stainless steel casting or extrusion with rubber insert.
 - .4 Connecting brackets: channel shaped, stainless steel extrusion or casting, continuous.
 - .5 Coat hook: combination hook and door bumper, aluminum or stainless steel casting.
- .4 Stainless steel sheet metal: ASTM A167, Type 304 with No. 4 satin finish.
- .5 Fasteners: Stainless steel tamperproof type screws and bolts.

2.3 **FABRICATION**

- .1 Toilet partitions shall be floor mounted, overhead braced.
- .2 Fabricate doors and partition panels of laminated plastic facings to finished thickness of 19 mm, nominal 1.47m high.
- .3 Fabricate stiles and doors of 19 mm thick solid phenolic core and panels of 13 mm thick solid phenolic core with decorative plastic laminate facing. Multiple resin-impregnated kraft and surface sheets shall be fused at high temperature and pressure with all edges finished and polished.
- .4 Fabricate and provide non-see-through style doors and pilasters by fabricating doors and pilasters with 45 deg. bevelled edges, with 6 mm gap between door and pilaster.
- .5 Unless otherwise indicated or required, doors shall be nominal 610 mm wide. Doors to meet barrier-free requirements shall be nominal 900 mm wide, with 860 mm clear opening when door is in open position.
- .6 Fabricate headrail of brake formed anti-grip 1.5 mm thick [16 ga.] clear anodized aluminum.
- .7 Fabricate pilaster boot assembly for both top and bottom junctions of 1.5 mm thick die formed stainless steel. Fabricate assembly in size to suit pilaster.
- .8 Fabricate wall hung screen panel same as toilet partitions, except size shall be 19 mm thick, 760 mm deep by 1067 mm high unless indicated otherwise.

3 Execution

3.1 **EXAMINATION**

- .1 Verify condition and dimensions of previously installed Work upon which this Section depends. Report defects to Consultant. Commencement of Work means acceptance of existing conditions.
- .2 Verify there is adequate supports and/or blocking in gypsum board assemblies prior to installation of toilet partitions and urinal screens.

3.2 **INSTALLATION**

- .1 Install compartments and cubicles in accordance with manufacturer's details and reviewed shop drawings, for a secure, plumb, square, and rigid installation.
- .2 Provide connecting brackets and secure to building structure and to pilasters. Insert edge of panels and closure pilasters into brackets and secure with through type sleeve bolt and nut.
- .3 Install doors with 6 mm to 10 mm maximum space between door panel and pilasters.
- .4 Install panels with 6 mm maximum space between panels and walls.
- .5 Install hardware in accordance with manufacturers' instructions and CAN/CSA B651-M.
- .6 Make compartments adjustable with screw jack through steel saddles made integral with pilaster. Conceal fixings with stainless steel shoes.
- .7 Provide for adjustment of floor variations with screw jack through steel saddles made integral with pilaster. Conceal ceiling fixings with stainless steel boot assemblies.
- .8 Install door tops edges aligned parallel with top edges of side partitions; determine alignment when doors are in closed position.
- .9 Brace through top of pilasters with rectangular shaped anti-grip headrail and fasten with stainless steel sheet metal screws.
- .10 Set panels and doors level and in line, raised approximately 300 mm above finished floor.
- .11 Hang doors to remain stationary at open position.
- .12 Equip each door with hardware. Adjust and align hardware for easy, proper function.
- .13 Provide closure pilasters, as required, at end units of compartment bank.
- .14 Remove and replace damaged components not acceptable to Consultant.

3.3 SCREEN ERECTION

- .1 Provide toilet and urinal screens consisting of panel and framing/supports as detailed.
- .2 Anchor screen panels to walls with wall hung urinal screen brackets at height as indicated.

3.4 ADJUSTING

- .1 Adjust operating hardware to work smoothly and without force. Adjust hinges of compartment doors so that all doors remain open to the same degree when unlatched, except doors at handicapped cubicles shall close automatically.

END OF SECTION

1 General

1.1 **SECTION INCLUDES**

- .1 Labour, Products, equipment and services for washroom accessories work in accordance with the Contract Documents.
- .2 Coordinate section with Interior Designer.

1.2 **REFERENCES**

- .1 ASTM A167, Specification for Stainless Steel and Heat-Resisting Chromium-Nickel Steel Plate, Sheet, and Strip.
- .2 ASTM A312, Specification for Seamless and Welded Austenitic Stainless Steel Pipes.
- .3 ASTM A653/A653M, Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvanealed) by the Hot-Dip Process.
- .4 ASTM F2285, Standard Consumer Safety Performance Specification for Diaper Changing Tables for Commercial Use.
- .5 CAN/CSA B651-M, Accessible Design for the Built Environment.

1.3 **SUBMITTALS**

- .1 Product data: Submit Product data to requirements of Section 01 30 00 indicating each washroom accessory describing size, finish, details of function, attachment methods, hardware and locks, description of rough-in frame, and building-in details of anchors for grab bars.
- .2 Closeout submittals:
 - .1 Submit for each Product operation and maintenance instructions for incorporating into the Operations and Maintenance Manuals in accordance with Section 01 78 00.
 - .1 Supply 2 keys for each lockable washroom accessory to Consultant.
 - .2 Master key washroom accessories which are keyed.
 - .3 Extended warranty: Submit extended warranty signed and registered by the manufacturer providing the warranty in the name of the Owner for the timeframe and coverage specified in this Section.

1.4 **DELIVERY, STORAGE AND HANDLING**

- .1 Deliver materials in sealed cartons and containers with manufacturer's name and product description clearly marked.

1.5 **EXTENDED WARRANTY**

- .1 Submit an extended warranty for washroom accessories work in accordance with the General Conditions, except that the warranty period is extended to 10 years.
 - .1 Against cracked or scratched mirrors, spoiling or deterioration of silvering or backing, loosening of fastenings or adhesive
 - .2 Coverage: complete replacement including effected adjacent work.

1.6 **MAINTENANCE**

- 1. Maintenance Tools: Provide special tools necessary for accessing, assembly/disassembly or removal of toilet, bath and cleaning accessories in accordance with Section 01 78 00.

2 Products

2.1 **MATERIALS**

- .1 Stainless steel:
 - .1 Sheet metal: ASTM A167, Type 304.
 - .2 Tubing: ASTM A312, Type 304.
- .2 Sheet steel: ASTM A653M, Z275; Cold rolled, commercial quality, surface preparation and pretreatment as required for applied finish.
- .3 Fasteners, screws and bolts: ASTM A167, Type 304 stainless steel, tamper-proof.

2.2 **ACCESSORIES**

- .1 Refer to drawings for quantity and location of washroom accessories.
- .2 Toilet paper dispenser: To be supplied by the Board and installed by the Contractor.
- .3 Soap dispenser: To be supplied by the Board and installed by the Contractor.
- ~~.4 Paper towel dispenser: To be supplied by the Board and installed by the Contractor.~~
- .4 Hand Dryer: To be supplied by the Board and installed by the Contractor.**
- .5 Sanitary pad holder: To be supplied by the Board and installed by the Contractor.**
- .6 Hand Dryer:**
 - .1 Surface mounted, lightweight automatic impact resistant hand dryer in silver colour with touch-free infra-red activation, 12 second drying time and HEPA filter with anti-microbial coating.**
 - .2 Electrical supply: 120-127 V AC, single phase, 60 Hz.**
 - .3 'Airblade V' by Dyson or approved alternative.**

- ~~5~~.7 Sanitary napkin disposal:
- .1 #B-254 by Bobrick or #0473-1A by ASI Group Canada; Surface mounted, top hung upper door with multi-staked piano hinge, surface mounted stainless steel wall box and waste receptacle, full length stainless steel hinge. Receptacle capacity: 5.7 L.
 - .2 Finish: All exposed edges Type 304 stainless steel with satin finish.
- ~~6~~.8 Grab bar:
- .1 Series B-6806-99 by Bobrick or #3800-P Series by ASI Group Canada; 38 mm diameter, 1.2 mm thick, concealed mounting with snap flange, complete with escutcheons. Lengths and configurations as indicated on drawings.
 - .2 Finish: Type 304 stainless steel with a satin finish and peened grip.
- ~~7~~.9 Grab bar (L-shaped):
- .1 'Series 6898-99 - L30x30' by Bobrick Washroom Equipment or approved alternative; 38 mm diameter, 1.2 mm thick, concealed mounting with snap flange, complete with escutcheons.
 - .2 Length and configuration: 762 x 762 mm, in L-shaped configuration as shown on Contract Drawings.
 - .3 Finish: Type 304 stainless steel with a satin finish and peened grip.
- ~~8~~.10 Mirror: 6 mm thick, mirror quality float glass
- .1 #B-290 Series by Bobrick or #20650 series by ASI Group Canada; mitred corners welded, and polished smooth.
 - .2 Dimensions: Sizes and locations as indicated on the Contract Drawings.
 - .3 Frame finish: Type 304 stainless steel satin finish.
- ~~9~~.11 Mirror (Tilt): 6 mm thick, mirror quality float glass.
- .1 #B-293 Series by Bobrick or #0535 Series by ASI Group Canada; mitred corners welded, and polished smooth.
 - .2 Dimensions: Sizes and locations as indicated on the Contract Drawings.
 - .3 Frame finish: Type 304 stainless steel satin finish.
- ~~10~~.12 Coat hook:
- .1 #B-7671 by Bobrick or approved alternative by ASI Group Canada; single robe hook, hook with flange, support arm and concealed mounting bracket.
 - .2 Finish: Type 304 stainless steel, bright polished finish.
- ~~11~~.13 Stainless steel shelf:
- .1 #0692 Series by ASI Group Canada or approved alternative; shelf fabricated from 1.2 mm thick stainless steel with 13 mm return edge and front edge hemmed for safety.
 - .2 Shelf complete with brackets fabricated from 1.2 mm thick stainless steel.
 - .3 Size: 100 mm wide x 450 mm length.
 - .4 Finish: Type 304 stainless steel, satin finish.

3 Execution

3.1 **EXAMINATION**

- .1 Verify condition and dimensions of previously installed Work upon which this Section depends. Report defects to Consultant. Commencement of work of this Section means acceptance of existing conditions.

3.2 **INSTALLATION**

- .1 Verify and coordinate templates, inserts, and rough-in frames and verify exact location of washroom accessories for installation.
- .2 Verify there is adequate supports and/or blocking in gypsum wall assemblies prior to installation of washroom accessories.
- .3 Provide fastening and mounting kits for washroom accessories.
- .4 Locate washroom accessories where indicated on Drawings and where directed by Consultant.
- .5 Install washroom accessory fixtures, accessories, and items in accordance with manufacturer's instructions and CAN/CSA B651-M. Provide exposed tamper-proof screws of stainless steel to match units.
- .6 Install washroom accessories plumb, level, and securely and rigidly anchored to substrate surfaces and framing. Adjust accessories for proper operation and verify mechanisms function smoothly.
- .7 Install grab bars to withstand minimum load of 1.3 kN applied vertically or horizontally. Provide necessary reinforcements as required.
- .8 Clean and polish exposed surfaces and fill accessories with necessary supplies prior to acceptance by Consultant.

END OF SECTION

1 General

1.1 **SECTION INCLUDES**

- .1 Labour, Products, equipment and services necessary for supplied and installed equipment work in accordance with the Contract Documents.

1.2 **SUBMITTALS**

- .1 Product data:
 - .1 Submit copies of manufacturer's Product data in accordance with Section 01 30 00 indicating:
 - .1 Performance criteria, compliance with appropriate reference standard, characteristics, limitations and warranties.
 - .2 Product transportation, storage, handling and installation requirements.
 - .2 Samples:
 - .1 Submit following sample panels in accordance with Section 01 30 00.
 - .1 Colour and finish of each item.
 - .3 Certificates: Submit manufacturer's certificates stating that products are in accordance with this specification.
 - .4 Closeout submittals: Submit recommended maintenance instructions and listing of recommended maintenance Products for incorporation into Operations and Maintenance Manuals in accordance with Section 01 78 00.

1.3 **QUALITY ASSURANCE**

- 1. Regulatory Requirements: All electrical equipment shall have attached labels attesting to CSA or Electrical Safety Authority approval, and shall have magnetic starters for motors, transformers, and overload protection.

1.4 **DELIVERY, STORAGE AND HANDLING**

- 1. Package or crate, and brace products to prevent damage or distortion of equipment in shipment and handling. Label packages and crates, and protect finish surfaces by sturdy wrappings or equivalent protection. Provide temporary skids under large or heavy units.
- 2. Do not deliver products to site until conditions are such that no damage will occur to them while in storage.
- 3. Store equipment at site in a manner to prevent damage to equipment.
- 4. Uncrate equipment only before installation.

1.5 **SCHEDULING**

1. Provide equipment or its parts ready for installation in accordance with construction schedule. Verify required delivery date sufficiently before delivery to ensure that construction is not delayed.

2 Products

2.1 **EQUIPMENT**

1. Provide reinforcing and anchorage for built-in products.
2. Insulate between dissimilar metals, and metal and masonry, to prevent electrolysis.
3. Equipment shall include all electrical components required by jurisdictional authorities, and to protect the equipment from damage during operation.
4. Equipment shall include all components, connections, devices and controls required to make it fully and safely operable.

2.2 **FABRICATION**

1. Fit joints and junctions between components tightly, in true planes, and to prevent entry of water to collect in component voids. Cap open ends of sections exposed to view.
2. Fabricate work with materials and component sizes, metal gauges, reinforcing anchors, and fastenings of adequate strength to ensure that it will remain free of warping, buckling, opening of joints and seams, and distortion within limits of intended and specified use. Conceal and weld connections wherever possible.
3. Cleanly and smoothly finish exposed edges of materials including holes and cutouts.
4. Provide reinforcing and attached anchorage for built-in products.
5. Provide holes and connections for work installed under other Sections.

3 Execution

3.1 **EXAMINATION**

- .1 Verify condition and dimensions of previously installed Work upon which this Section depends. Report defects to Consultant. Commencement of work of this Section means acceptance of existing conditions.
2. Before installation commences, ensure that mounting devices, members and surfaces are satisfactory for fitting, and adequate for securing of work.

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

3.2 **INSTALLATION**

1. Obtain from manufacturer or supplier, anchorage information, roughing-in dimensions, templates and service requirements for installation of work of this Section. Also obtain assistance from manufacturer or supplier, for the setting of anchorage devices, and construction of other work incorporated with equipment specified in this Section in order that they function as intended.
2. Install work to meet manufacturer's recommended specifications, true, tightly fitted, and level or flush to adjacent surfaces, as suitable for installation.
3. Work shall include rough hardware, fastenings and other items necessary for secure installation.
4. Use only fastenings suitable for materials. Do not use through fastening at floors or walls.
5. Install work straight, plumb, level, and secured to prevent distortion or displacement, or both. Shim as necessary with concealed shims. Where required, use grout on which iron oxide deposits will not form.
6. Secure fixed equipment to building structure or construction as required to maintain it permanently in place, and so that it functions properly with no damaging vibration to the building or itself.
7. Install equipment with connections provided as required for plumbing and electrical services.
8. Provision of mechanical services and connection of equipment to mechanical work is specified in Division 22.
9. Provision of electrical service and connections of equipment to the services is specified in Division 26.

3.3 **REPAIR**

1. Refinish damaged or defective work so that no variation in surface appearance is discernible. Refinish work at site only if approved by Architect.

3.4 **ADJUSTING**

1. Verify under work of this Section that installed products function properly, and adjust them accordingly to ensure satisfactory operation.
2. Lubricate equipment as specified by equipment manufacturer.

3.5 CLEANING

1. Clean and polish all surfaces that are exposed to view from any location on completion of installation.
2. Remove packaging materials and debris from installation from the site.

3.6 DEMONSTRATION

1. After start-up, adjusting and cleaning, demonstrate operation of equipment to Owner and Architect, prior to Substantial Performance of the Work. Demonstrations shall be made:
 - .1 When the Work is certified complete by the Architect.
 - .2 When the Work is turned over to the Owner.
2. Knowledgeable representatives of the manufacturers and installers of the equipment being demonstrated shall be present at time of demonstrations.

3.7 SCHEDULE OF EQUIPMENT

1. Owner supplied and Contractor installed items: Construction and manufacturing tech equipment quantities as indicated on drawings (anchoring, etc. included as part of install by contractor):
 - .1 Toilet paper dispenser.
 - .2 Soap dispenser.
 - .3 Paper towel dispenser.
 - .4 Additional items as indicated by the Consultant.
2. School board supplied items: Construction and manufacturing tech equipment quantities as indicated on drawings (anchoring, etc. included as part of install by contractor):
 - .1 Teaching wall;
 - .1 White boards; Two white boards with 75" TV at the center.
 - .2 Tackboards; to be provide on other side of wall above small storage units.
 - .2 WIFI and apple TV.
 - .3 Teachers desk and chairs
 - .4 Student Desk and chairs.
 - .5 Additional items as indicated by the Consultant.

END OF SECTION