



Specifications

Architectural, Electrical

Specifications for
DOWNSVIEW SECONDARY SCHOOL
Accessibility Upgrades
TR-25-0942

7 Hawksdale Road, North
North York
Ontario
M3K 1W3

for the
Toronto District School Board
5050 Yonge St, North York,
Ontario
M2N 5N8

Prime Consultant:

Kingsland + Architects Inc.
110 Cumberland Street, Suite 262
Toronto, Ontario
M5R 3V5

Issued for Tender
Project No. A25003

April, 2026



This seal does not govern the following materials bound into these Specifications.

- **DIVISION 26, 27 ELECTRICAL**
- **APPENDIX "B" REPORTS**

END OF SECTION

TABLE OF CONTENTS

<u>SECTION NUMBER</u>	<u>TITLE</u>	<u>NO. OF PAGES</u>
<u>DIVISION 0</u>	<u>BIDDING AND CONTRACT DOCUMENTS</u>	
00 00 00	Cover Page	1
00 01 00	Consultant' Professional Seals	1
00 01 10	Table of Contents	2
 <u>DIVISION 1 GENERAL REQUIREMENTS</u>		
01 14 00	Work Restrictions	5
01 19 00	Specifications and Documents	2
01 31 00	Project Managing and Coordination	5
01 32 00	Construction Progress and Documentation	2
01 33 00	Submittal Procedures	5
01 35 00	Fire Safety Procedures	5
01 35 23	Health and Safety Procedures	4
01 35 43	Hazardous Materials	3
01 42 00	References	4
01 45 00	Quality Control	4
01 51 00	Temporary Utilities	4
01 53 00	Temporary Construction Facilities	5
01 61 00	Product Requirements	4
01 70 00	Examination and Preparation	2
01 73 00	Execution and Cutting and Patching	3
01 74 00	Cleaning and Waste Management	3
01 78 00	Closeout Submittals and Requirements	5
01 79 00	Demonstration and Training	3
 <u>DIVISION 2 FACILITY REMEDIATION</u>		
02 41 19	Selective Demolition	5
02 82 00.01	Type 1 Asbestos Abatement (Refer to APPENDIX 'B' REPORTS for DSS survey)	4
 <u>DIVISION 6 WOOD & PLASTICS</u>		
06100	Rough Carpentry	3
 <u>DIVISION 7 THERMAL & MOISTURE PROTECTION</u>		
07 92 00	Joint Sealants	11

TABLE OF CONTENTS

<u>SECTION NUMBER</u>	<u>TITLE</u>	<u>NO. OF PAGES</u>
<u>DIVISION 8 DOORS & WINDOWS</u>		
08710	Finish Hardware Hardware Schedule	3
<u>DIVISION 9 FINISHES</u>		
09 91 16	Interior Painting	9
<u>DIVISION 14 CONVEYING SYSTEMS</u>		
14 42 13	Inclined Platform Lift	7
<u>DIVISION 26 ELECTRICAL</u>		
26 05 00	Common Work Results For Electrical	14
26 05 01	Basic Materials & Methods	14
<u>DIVISION 27 COMMUNICATION</u>		
27 00 00	Communication Requirements – V1.9 (TDSB STANDARD COMMUNICATIONS SPECIFICATIONS)	25
<u>APPENDIX 'A' – SCHEDULES AND DETAILS</u>		
00850	LIST OF DRAWINGS	1
00861	DOOR AND FRAME SCHEDULE	2
<u>APPENDIX 'B' – REPORTS</u>		
Report 1	Hazardous Materials Survey dated June 6, 2024 prepared by T. Harris Environmental Management	32

1.0 GENERAL

1.1. SECTION INCLUDES

- .1 Connecting to existing services
- .2 Special scheduling requirements
- .3 TDSB Specific Requirements

1.2. RELATED SECTIONS

- .1 Section 01 53 00 - Temporary Construction.
- .2 Section 01 33 00 - Submittal Procedures.
- .3 This section describes requirements applicable to all Sections within Divisions 02 to 49.

1.3. EXISTING SERVICES

- .1 Notify Owner and Consultant and utility companies of intended interruption of services and obtain required permission.
- .2 Where Work involves breaking into or connecting to existing services, give Consultant and Owner, forty-eight (48) hours of notice for necessary interruption of mechanical or electrical service throughout course of work.
 - .1 Keep duration of interruptions minimum.
 - .2 Perform interruptions after normal working hours of occupants, preferably on weekends.
- .3 Provide for vehicular, pedestrian and personnel traffic.
- .4 Construct barriers in accordance with Section 01 53 00.

1.4. AFTER HOURS WORK

- .1 Schedule Work with school staff through the Board's contact so as to limit disruption to school operations. Include for any overtime, to ensure orderly and continuous progression of Work and operation of school.
- .2 Direct calls from Contractors to Board staff to adjust alarms and to arrange for access will not be accepted. All correspondence must be through the Project Manager.
- .3 Arrange 48 hours in advance with Board to obtain an access card and adjust security alarms for after hours Work.
- .4 Bidders are cautioned that the Board will be compensated by the Contractor for false alarms. Any costs associated with each false alarm will be levied against the Contractor for false fire alarm activation or security alarm activation. These costs may include, but are not limited to:
 - .1 Fines or penalties imposed by the local Fire Services,
 - .2 Fines or penalties imposed by the local Police Services,
 - .3 Overtime costs borne by the Board.
- .5 Contractors are responsible for ensuring doors and windows are secured prior to leaving school.
- .6 Unless specifically stated otherwise school activities take precedence over Contractor's activities.

1.5. SPECIAL REQUIREMENTS

- .1 Schedule and perform work in occupied areas to Board Representative's approval.
- .2 Schedule and perform noise generating work to Board Representative's approval.
- .3 Submit schedule of special requirements or disruptions in accordance with Section 01 33 00.

- .4 All Contractor personnel are restricted to the job site and necessary access routes. No personnel shall visit other areas or buildings without specific authorization.

1.6. TDSB SPECIFIC SUPPLEMENTARY REQUIREMENTS

Following are TDSB specific SUPPLEMENTARY requirements which are to be read in conjunction with Division 1 in its entirety.

1.1. COMMUNICATION (TDSB SPECIFIC REQUIREMENTS)

- .1 At the outset of the project the Contractor shall provide to the Board Project Manager all relevant contact information for the Site Superintendent and GC Project Manager including names and cell phone numbers.
- .2 The Contractor shall provide at least one “emergency contact” telephone number at which the Contractor’s representative can be reached directly during all work hours.
- .3 The Site Superintendent must have the ability to be reached directly during all times or a contact provided that can be provided during all times.
- .4 In the event of a safety issue requiring contractual clarification or action (i.e. Change Notice, etc.), the contractor shall ensure that, where applicable, the action is followed up with appropriate documentation.

1.2. OPERATION OF MOTOR VEHICLES (TDSB SPECIFIC REQUIREMENTS)

- .1 Vehicles shall not enter, be parked or operate at school sites without first obtaining authorization from the assigned project manager.
- .2 Such vehicles shall be always operated with due caution while on school property on or near school grounds, conforming to all posted traffic controls such as speed limit, stop signs, etc.
- .3 Vehicles or equipment are not permitted on school yards without prior approval from the project manager. Should approval be granted, vehicles and equipment operated in the school yard are not permitted within 30 minutes of school bell times, during recess, lunch hour or other times of outdoor activity.
- .4 Must employ flag person to manage all operations of vehicles and equipment on site at all times they are in operation.
- .5 Vehicles or equipment must never be left unattended with the engine running. Engines must not be left idling unnecessarily.

1.3. SITE SAFETY SIGNAGE (TDSB SPECIFIC REQUIREMENTS)

- .1 Standardized Safety Signage is required at all construction entrances authorization
- .2 If not designated in the Contract Documents, the location of the Safety Signage shall be confirmed with the Board Project Manager and Consultant at the outset of the Project and before the placement of hoarding and fencing.

- .3 Total surface area of signage is to avoid exceeding municipal standards that would require a separate signage permit.

1.4. WORKING HOURS (TDSB SPECIFIC REQUIREMENTS)

- .1 Are to comply with the requirements of the City of Toronto by-law
- .2 From June 26, 2026, to August 28, 2026, Work can be completed anytime, if it complies with the City of Toronto by-law.
- .3 It is the Successful Bidder's responsibility to schedule shift work (as required) to meet Project schedule deadlines; this may mean daytime as well as after-hours Work.
- .4 Prior to June 26, 2026, and after August 28, 2026, all Work must be completed outside of school operational hours of 8:00AM – 6:30PM and on weekends.
- .5 Prior to June 29, 2026, and after August 28, 2026, all Work which would cause a disturbance or safety hazard (including Work that generates odours, any asbestos abatement, any environmental demolition, or cutting/coring) must be completed prior to 8:00 AM or after 6:30 PM Monday to Friday, or anytime on weekends.
- .6 Prior to June 26, 2026, and after August 28, 2026, all tools, equipment, and materials must be brought into or taken out of the construction space(s) prior to 8:00 AM and/or after 6:30 PM.
- .7 A TDSB Caretaker must always be on the premises while construction works are being completed. Caretaking hours are from 6:00am to 11:00pm Monday to Friday, excluding holidays and board closures.

1.5. SIGN-IN REQUIREMENTS (TDSB SPECIFIC REQUIREMENTS)

- .1 The Contractor shall obtain identification badges by filling out the "Request for Issue of Identification Badges for Consultant/Contractor" form and submitting, along with badge deposit (\$75.00 each). **Contact information will be provided during the pre-construction meeting**
- .2 The Contractor is required to sign-in themselves, their subcontractors or any other person associated with the project at school main office to record their arrival time.
- .3 The Contractor will compile a sign-in sheet with for all forces working on the project and submit to the main office at the start of each day.
- .4 ID badges shall be worn at all times while on Board property. It shall be the Bidder's responsibility to assign and track each badge. The wearing of badges by all personnel shall be strictly enforced.
- .5 At the end of each day the Contractor shall obtain the sign-in sheet previously submitted to the main office, record the departure times of themselves, Subcontractors or any other person associated with the project and return the sign-in sheet to the main office.
- .6 The Bidder's inability to access the site due to not having current badges will not absolve the Bidder of not being able to complete the project by the stipulated date.

1.6. USE OF EXISTING FACILITIES (TDSB SPECIFIC REQUIREMENTS)

- .1 Use of school washrooms, both student and staff is strictly prohibited at all times. It is the responsibility of the Contractor to provide appropriate washroom facilities as per the regulations set out by the Authority Having Jurisdiction for all staff, subcontractors and delivery drivers associated with the construction project and coordinate such location with the project supervisor. The contractor is responsible to secure any portable toilet facilities

to mitigate vandalism, security issues, etc. and is responsible for the ongoing maintenance of such facility.

- .2 Use of existing school elevators by the Contractor, Subcontractor, Suppliers or another individual associated with the project is prohibited. The Contractor will not be permitted to utilize the elevator for moving of materials, equipment or personnel while carrying out the works.
- .3 Use of existing school services, including but not necessarily limited too; Water, Hydro, Internet, Phones/Fax and heat are not permitted. The contractor will include in their contract price all temporary services required to carry out the works.

1.7. CONTRACTOR PARKING (TDSB SPECIFIC REQUIREMENTS)

- .1 Contractor parking is not available. The contractor will need to make all arrangements for offsite parking in accordance to all applicable By-law, zoning, etc.

1.8. CONSTRUCTION STAGING (TDSB SPECIFIC REQUIREMENTS)

- .1 No storage is available on site for the contractor. The contractor must make all necessary arrangements for storage containers as needed and ensure security of such.
- .2 Prior to construction start, the contract must provide the Board and Consultant a copy of their construction staging plan. The plan is to include a site plan identifying location of proposed fencing, location of portable toilets, storage containers, etc. The plan is to identify which doors the contractor will be using to enter the school, path of travel for equipment deliveries etc. The Board and consultant reserve the right to request any changes to the plan to ensure the safety of students, staff and maintaining the ongoing operations of the school.

1.9. BOARD HEALTH & SAFETY DEPARTMENT REP (TDSB SPECIFIC REQUIREMENTS)

- .1 A representative of the Board's Health, & Safety Dept. ('Environment, Health and Safety Officer') may visit site at any anytime throughout the duration of the Contract to review the site, as it relates to the safety of the occupied areas of the site. Such site review shall neither constitute an inspection or approval for the Contractor.
- .2 Concerns or issues identified by the representative from the Board's Health, Wellness & Safety Dept. shall be communicated through the Board Project Manager and the school Principal for corrective action.
- .3 Contractor shall ensure full access to all site areas, at all times, for the Board's Health, Wellness & Safety Department Representative.

1.10. INCIDENT REPORTING (TDSB SPECIFIC REQUIREMENTS)

- .1 If at the workplace an accident, explosion, or fire causes a person injured (where they cannot perform their regular duties), a death or a critical injury the Contractor must follow all applicable regulations with respects to reporting. When reporting to the authority having jurisdiction the Board's Project Supervisor and Health & Safety Representative will be copied on the correspondence.

1.11. SITE MEETINGS (TDSB SPECIFIC REQUIREMENTS)

- .1 The Contractors Site Supervisor and Project Manager are required at all site meetings during the course of the project.
- .2 The Contractor shall record minutes of each meeting and promptly distribute copies to be received by all participants not later than three days after meeting has been held. Distribute minutes of meetings to all Consultants, whether in attendance or not.

1.12. DOCUMENTS ON SITE (TDSB SPECIFIC REQUIREMENTS)

- 1 Contractor's field office shall at all times contain a complete set of Contract Documents (Drawings and Specifications) with all addenda, site instructions, change orders, reviewed shop drawings and samples, colour schedule, paint materials schedules, hardware list, progress reports and meeting minutes.

1.13. CASH FLOW CHART (TDSB SPECIFIC REQUIREMENTS)

- 1 Within 7 days after award of Contract, submit, in form approved by Consultant, cash flow chart broken down on a monthly basis in an approved manner. Cash flow chart shall indicate anticipated Contractor's monthly progress billings from commencement of work until completion.
- .2 Update cash flow chart whenever changes occur to scheduling and in manner and at times satisfactory to Consultant.
- .3 The Consultant reserves the right to receive from the Contractor at any time, upon request, copies of actual purchase or work orders of any material or products to be supplied for the work.
- .4 If materials and products have not been placed on order, the Consultant may instruct such items to be placed on order, if direct communication in writing from the manufacturer or prime suppliers is not available indicating that delivery of said material will be made in sufficient time for the orderly completion of the Work.
- .5 The Consultant's review of purchase orders or other related documentation shall in no way release the Contractor, or his subcontractors and suppliers from their responsibility for ensuring the timely ordering of all materials and items required, including the necessary expediting, to complete the work as scheduled in accordance with the Contract Documents.

END OF SECTION

1.0 GENERAL

1.1. RELATED DOCUMENTS

- .1 This section describes requirements applicable to all sections within Divisions 02 to 49.

1.2. WORDS AND TERMS

- .1 Conform to definitions and their defined meanings in the Agreement and Definitions portion of CCDC 2 for Supplementary Words and Terms listed in Section 00 56 13.

1.3. COMPLEMENTARY DOCUMENTS

- .1 Generally, drawings indicate graphically, the dimensions and location of components and equipment. Specifications indicate specific components, assemblies, and identify quality.
- .2 Drawings, specifications, diagrams and schedules are complementary, each to the other, and what is required by one, to be binding as if required by all.
- .3 Should any conflict or discrepancy appear between documents, which leaves doubt as to the intent or meaning, apply the Precedence of Documents article below or obtain guidance or direction from Consultant.
- .4 Examine all discipline drawings, specifications, schedules, diagrams and related Work to ensure that Work can be satisfactorily executed.
- .5 All specification sections of the Project Manual and Drawings are affected by requirements of Division 01 sections.

1.4. PRECEDENCE OF DOCUMENTS

- .1 In the event of conflict within and between the Contract Documents, the order of priority within specifications and drawings for this project are - from highest to lowest:
 - .1 the Agreement and Definitions between the Owner and the Construction
 - .2 the Defined Terms, Definitions;
 - .3 Supplementary Conditions;
 - .4 the General Conditions;
 - .5 Sections of Division 01 of the specifications;
 - .6 Technical specifications Sections of Divisions 02 through 49 of the specifications.
 - .7 Schedules and Keynotes:
 - .1 Material and finishing schedules within the specifications, then;
 - .2 Material and finishing schedules on drawings, then;
 - .3 Keynotes and definitions thereto, then;
 - .8 Drawings:
 - .1 Drawings of larger scale shall govern over those of smaller scale of the same date, then;
 - .2 Dimensions shown on drawings shall govern over dimensions scaled from drawings, then;
 - .3 Location of utility outlets indicated on architectural detail drawings takes precedence over positions or mounting heights located on mechanical or electrical Drawings.
 - .9 Later dated documents shall govern over earlier documents of the same type.

1.5. SPECIFICATION GRAMMAR

- .1 Specifications are written in the imperative command mode, in an abbreviated form.
- .2 Imperative language of the technical sections is always directed to the Contractor identified as a primary constructor, as sole executor of the Contract, unless specifically noted otherwise.
 - .1 This form of imperative command mode statement requires the primary constructor to perform such action or Work.
 - .2 Perform all requirements of the Contract Documents whether stated imperatively or otherwise.
- .3 Division of the Work among subcontractors, suppliers, or others is solely the prime constructor's responsibility. The Consultant(s) and specification authors assume no responsibility to function or act as an arbiter to establish subcontract scope or limits between sections or divisions of Work.

END OF SECTION

1.0 GENERAL

1.1. RELATED SECTIONS

- .1 Section 01 32 00 - Construction Progress Documentation.
- .2 Section 01 33 00 - Submittal Procedures.
- .3 Section 01 53 00 – Temporary Construction Facilities
- .4 Section 01 61 00 – Product Requirements
- .5 Section 01 78 10 – Closeout Submittals and Requirements
- .6 This section describes requirements applicable to all Sections within Divisions 02 to 49.

1.2. PROJECT COORDINATION

- .1 Perform coordination of progress schedules, submittals, use of site, temporary utilities, construction facilities and construction Work, with progress of Work of other contractors, under instructions of the Consultant.
- .2 The Contractor shall have total control of the Work and shall effectively direct and supervise the Work so as to ensure conformity with the Contract Documents and within the Contract Time.
- .3 The Contractor shall be solely responsible for the construction means, methods, sequences, and procedures and for coordinating parts of the Work under the contract.
- .4 Co-ordinate progress of the Work, progress schedules, submittals, use of site, temporary utilities, construction facilities, safety regulations and fire protection, as per authorities having jurisdiction codes.
- .5 The Consultant has the authority to stop the Work:
 - .1 whenever they observe or are made aware of unsafe conditions.
 - .2 whenever it is deemed necessary to protect the interests of the Board,
 - .3 whenever materials or workmanship are in contravention to the Contract Documents

1.3. SITE SUPERVISOR AND PROJECT MANAGER

- .1 If requested, the Contractor shall provide the Consultant, in writing, the name of the Project Manager and Site Supervisor, and proof of competent experience in similar projects.
- .2 Performance of the Contractors Project Manager and Site Supervisor
 - .1 If the Board and or the Consultant become concerned with any of: Site Safety, Project Schedule, or general compliance with the tender documents due to the performance of the Site Supervisor or Project Manager, the Consultant and or the Board will identify the concerns in writing to the Contractor.
 - .2 The Contractor shall respond in writing to the Board and Consultant with a corrective action for each item within 24 hours.
 - .3 If it is found that any of the corrections are not immediately implemented, the Consultant and the Board shall meet with the General Contractor to review the credentials including curriculum vitae and comparable experience of a replacement Site Supervisor and or Project Manager proposed by that Contractor.
 - .4 All outstanding concerns initiating the replacement of the personnel will be immediately addressed to the satisfaction of the Consultant and the Board.
- .3 If the Board and or the Consultant become concerned with site safety, project schedule or general compliance with the tender documents due to the performance of the Site Supervisor or the Project Manager, the Consultant or the Board will issue the concerns in writing to the Contractor. The Contractor shall respond in writing within 24 hours to the

Consultant and the Board. If any of the corrections are not immediately implemented, the Consultant or the Board will schedule a meeting with the Consultant, General Contractor and the Board. At this meeting the Contractor will introduce the new Project Manager, and or Site Supervisor and present the Curriculum Vitae for each showing proof of comparable experience in similar projects. The Contractor will then address the outstanding concerns to the satisfaction of the Consultant and the Board.

- .4 The Project Manager, and/or Site Supervisor shall not be replaced by the Contractor without prior written approval from the Board and the Consultant.

1.4. PERMITS

- .1 **The Board will obtain & pay for all building permits, but the Contractor is responsible for all other permits, including electrical inspection and fire alarm verification.**

1.5. CONSTRUCTION DOCUMENTS

- .1 The Consultant will provide the Contractor with PDF copies of both the drawings and the specification and CAD format files of the drawings at no charge to the Contractor. All printing will be at the cost of the Contractor including the AS-BUILT documents.

1.6. PRECONSTRUCTION MEETING

- .1 Immediately prior to construction and upon notification by the Consultant of a time and date, the Contractor shall attend the preconstruction meeting at a location as determined by the Consultant, along with authoritative representatives of certain key subcontractors as specifically indicated in the conference notice. Agenda to include following:
 - .1 Appointment of official representative of participants in Work.
 - .2 Project communications procedures
 - .3 Schedule of Work, progress scheduling (including long lead items, cash allowance items) as specified in Section 01 32 00.
 - .4 Schedule of submission of shop drawings, samples, colour chips as specified in Section 01 33 00.
 - .5 Requirements for temporary facilities, washrooms, refuse bin, site sign, offices, storage sheds, utilities, fences as specified in Section 01 53 00.
 - .6 Delivery schedule of specified equipment as specified in Section 01 61 00.
 - .7 Proposed changes, change orders, procedures, approvals required, mark-up percentages permitted, time extensions, overtime, and administrative requirements.
 - .8 Owner furnished products.
 - .9 Record drawings as specified in Section 01 78 10.
 - .10 Maintenance material and data as specified in Section 01 78 10.
 - .11 Take-over procedures, acceptance, and warranties as specified in Section 01 78 10.
 - .12 Monthly progress claims, administrative procedures, photographs, and holdbacks.
 - .13 Appointment of inspection and testing agencies
 - .14 Insurances and transcript of policies.
 - .15 Review Vendor Performance Evaluation for the Contractor and Subcontractors
 - .16 Hot Work Permit Process
 - .17 Security Access, Fire Alarm shut down procedures
 - .18 Any other items as required by owner, contractor or Consultant.

1.7. ON-SITE DOCUMENTS

- .1 Maintain at job site at all times, one copy (written or digital) each of the following:
 - .1 Complete set of Contract drawings.
 - .2 Specifications.
 - .3 All Addenda.
 - .4 Site Instructions and Sketches
 - .5 Reviewed shop drawings and samples.
 - .6 Change Orders and Contemplated Change Orders.
 - .7 Other modifications to Contract.
 - .8 Site Instructions
 - .9 Colour schedule
 - .10 Hardware List
 - .11 Field test reports.
 - .12 Copy of approved Work schedule.
 - .13 Manufacturers' installation and application instructions.
 - .14 Progress reports and meeting minutes.
 - .15 Approved building permit documents.
 - .16 Copy of current Ontario Building Code and National Building Code.
 - .17 CSA Standard, CGSB Specifications. ASTM Documents and other standards referenced to in the specifications.
 - .18 Labour conditions and wage schedules.
 - .19 Applicable current editions of municipal regulations and by-laws. Current building codes, complete with addenda bulletins applicable to the Place of the Work.

1.8. SCHEDULES

- .1 Within three weeks following the award of the Contract, submit a detailed, trade by trade progress schedule for the work in a bar chart form acceptable to the Consultant.
- .2 Submit preliminary construction progress schedule as specified in Section 01 32 00 to Consultant coordinated with Consultant's project schedule.
- .3 After review, revise and resubmit schedule to comply with revised project schedule.
- .4 During progress of Work revise and resubmit as directed by Consultant.
- .5 Provide schedule updates every month with request for Payment, for duration of Contract.

1.9. CONSTRUCTION PROGRESS MEETINGS

- .1 Prior to the commencement of the Work, the Contractor together with the Consultant shall mutually agree to a sequence for holding regular "on site meetings".
- .2 The Contractor will organize site meetings. Ensure persons, whose presence is required, are present and relative information is available to allow meetings to be conducted efficiently.
- .3 Contractor, major subcontractors and consultants involved in Work are to be in attendance.
- .4 Post and forward copies of progress schedules for advice of Subcontractors, Owner and Consultant.
- .5 Notify parties minimum five (5) days prior to meetings.
- .6 Record minutes of meetings and circulate to attending parties and affected parties not in attendance within two (2) days after meeting.
- .7 Agenda to include following:
 - .1 Review, approval of minutes of previous meeting.

- .2 Review of Work progress since previous meeting.
- .3 Field observations, problems, conflicts.
- .4 Problems which impede construction schedule.
- .5 Review of off-site fabrication delivery schedules.
- .6 Corrective measures and procedures to regain projected schedule.
- .7 Revision to construction schedule.
- .8 Progress schedule, during succeeding work period.
- .9 Review submittal schedules: expedite as required.
- .10 Maintenance of quality standards.
- .11 Review proposed changes for effect on construction schedule and on completion date.
- .12 Review site security issues.
- .13 Other business.
- .8 Schedule additional meetings, to expedite progress, should work require it.
- .9 Keep Owner and Consultant informed of progress, of delays and potential delays during all stages of Work. Do everything possible to meet progress schedule
- .10 Schedule and administer pre-installation meetings when specified in sections and when required to coordinate related or affected Work.

1.10. SUBMITTALS

- .1 Prepare and issue submittals to Consultant for review.
- .2 Submit preliminary Shop Drawings, product data and samples for review for compliance with Contract Documents; for field dimensions and clearances, for relation to available space, and for relation to Work of other contracts. After review, revise and resubmit for transmittal to Consultant.
- .3 Submit requests for payment for review, and for transmittal to Consultant.
- .4 Submit requests for interpretation of Contract Documents, and obtain instructions through Consultant.
- .5 Process substitutions through Consultant.
- .6 Process change orders through Consultant.
- .7 Deliver closeout submittals for review and preliminary inspections, for transmittal to Consultant.

1.11. RECORD (AS-BUILT) DOCUMENTS AND SAMPLES

- .1 Procedures for record as-built documents and samples as specified in Section 01 78 10.
- .2 Keep as-built documents and samples available for inspection by Consultant.

1.12. CLOSEOUT PROCEDURES

- .1 Take-over procedures, acceptance, and warranties as specified Section 01 78 10
- .2 Notify Consultant and Board when Work is considered ready for Substantial Performance.
- .3 Accompany Consultant and Board on preliminary inspection to determine items listed for completion or correction.
- .4 Comply with Consultant's instructions for correction of items of Work listed in executed certificate of Substantial Performance.
- .5 Notify Consultant of instructions for completion of items of Work determined in Consultant's final inspection.

END OF SECTION

1.0 GENERAL

1.1. RELATED SECTIONS

- .1 Section 01 33 00 - Submittal Procedures.
- .2 This section describes requirements applicable to all Sections within Divisions 02 to 49.

1.2. SCHEDULES

- .1 Within seven 7 days following the award of the Contract, submit a detailed cash flow chart broken down on a monthly basis, in a manner acceptable to the Consultant. Cash flow chart shall indicate anticipated Contractor's monthly progress billings from commencement of work until completion.
- .2 Update cash flow chart whenever changes occur to scheduling and in manner and at times satisfactory to Consultant.
- .3 Submit schedule of values at least fourteen (14) days before the first application
- .4 Submit schedules as follows:
 - .1 Submittal Schedule for Shop Drawings and Product Data.
 - .2 Submittal Schedule for Samples.
 - .3 Submittal Schedule for timeliness of Owner-furnished Products.
 - .4 Product Delivery Schedule.
 - .5 Cash Allowance Schedule for acquiring Products and Installation.
 - .6 Shutdown or closure activity.

1.3. CONSTRUCTION PROGRESS SCHEDULING

- .1 Submit initial schedule to the Consultant and the Board in duplicate within seven (7) days after following the award.
- .2 Schedule Format.
 - .1 Prepare schedule in form of a horizontal bar chart.
 - .2 Split horizontally for projected and actual performance.
 - .3 Provide horizontal time scale identifying each Working Day of each week.
- .3 Schedule Submission.
 - .1 Consultant will review schedule and return reviewed copies within five (5) days after receipt.
 - .2 Submit schedules in electronic format, forward to the Consultant and Owner as a pdf. file.
 - .3 Resubmit finalized schedule within five (5) days after return of review copy.
 - .4 Submit revised progress schedule with each application for payment.
 - .5 Distribute copies of revised schedule to:
 - .1 Job site office.
 - .2 Subcontractors.
 - .3 Other concerned parties.
 - .6 Instruct Consultant to report to Contractor within ten (10) days, any problems anticipated by timetable shown in schedule.
- .4 Submit revised schedules with Application for Payment, identifying changes since previous version.
- .5 Select either of the following paragraphs to identify the type and format of schedule required.

- .6 Show complete sequence of construction by activity, identifying Work of separate stages and other logically grouped activities. Indicate the early and late start, early and late finish, float dates, and duration.
- .7 Indicate estimated percentage of completion for each item of Work at each submission.
- .8 Indicate submittal dates required for shop drawings, product data, samples, and product delivery dates, including those furnished by Owner and required by Allowances.
- .9 Include dates for commencement and completion of each major element of construction:
- .10 Indicate projected percentage of completion of each item as of first day of month.
- .11 Indicate progress of each activity to date of submission schedule.
- .12 Indicate changes occurring since previous submission of schedule:
 - .1 Major changes in scope.
 - .2 Activities modified since previous submission.
 - .3 Revised projections of progress and completion.
 - .4 Other identifiable changes.
- .13 Provide a written report to define:
 - .1 Problem areas, anticipated delays, and impact on schedule.
 - .2 Corrective action recommended and its effect.
 - .3 Effect of changes on schedules of other subcontractors.

1.4. PROGRESS PHOTOGRAPHS

- .1 Digital Photography:
 - .1 Submit electronic copy of progress photographs of project, Digital format, minimum 300 in megapixel resolution.
 - .2 Identification: Name and number of project and date of exposure indicated.
 - .3 Provide both interior and exterior photographs.
 - .4 Number of Viewpoints: Locations of viewpoints determined by Consultant.
 - .5 Frequency: Monthly with progress statement. Provide the required number of pictures to accurately reflect the submitted progress percentage.

1.5. SHOP DRAWING SUBMITTAL SCHEDULE

- .1 Include schedule for submitting shop drawings, product data, samples
- .2 Indicate dates for submitting, review time, resubmission time, and last date for meeting fabrication schedule.
- .3 Include dates when shop drawings and samples will be required for Owner-furnished products.
- .4 Include dates when reviewed submittals will be required from Consultant.
- .5 Provide final signed off copies of the shop drawings in digital format to the Board.

END OF SECTION

1.0 GENERAL

1.1. RELATED SECTIONS

- .1 Section 01 32 00 - Construction Progress Documentation.
- .2 Section 01 78 10 - Closeout Submittals.
- .3 This section describes requirements applicable to all Sections within Divisions 02 to 49.

1.2. ADMINISTRATIVE

- .1 Submit to Consultant submittals listed for review. Submit with reasonable promptness and in orderly sequence so as to not cause delay in 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 Work affected by submittal shall not proceed until review is complete.
- .3 Present Shop Drawings, product data, samples and mock-ups in Metric (SI) units. Shop drawings containing imperial measurements will be rejected.
- .4 Where items or information is not manufactured or produced in SI Metric units, converted values within the metric measurement to the next largest imperial size available. Tolerances of .0625 acceptable.
- .5 Review submittals prior to submission to Consultant. This review represents that necessary requirements have been determined and verified, or will be, and that each submittal has been checked and co-ordinated with requirements of Work and Contract Documents.
- .6 Submittals not stamped, signed, dated, identified as to specific project, and attesting to their being reviewed will be returned without being examined and shall be considered rejected.
- .7 Shop drawings which require the approval of a legally constituted authority having jurisdiction shall be submitted by Contractor to such authority for approval. Such shop drawings shall receive final approval of authority having jurisdiction before Consultant's final review.
- .8 No work, requiring a shop drawing submission, shall be commenced until the submission has received Consultant's final review. Only shop drawings bearing Consultant's review stamp are to be sent and used on the job site.
- .9 Notify Consultant, in writing at time of submission, identifying deviations from requirements of Contract Documents stating reasons for deviations.
- .10 Shop drawings shall not contain substituted materials unless such substitutions have been requested in advance and approved by Consultant.
- .11 Verify field measurements and affected adjacent Work are coordinated.
- .12 Contractor's responsibility for errors and omissions in submission is not relieved by Consultant's review of submittals.
- .13 Contractor's responsibility for deviations in submission from requirements of Contract Documents is not relieved by Consultant review.
- .14 Keep one (1) reviewed copy of each submission on site.

1.3. SHOP DRAWINGS AND PRODUCT DATA

- .1 The term "Shop Drawings" means drawings, diagrams, illustrations, schedules, performance charts, brochures and other data which are to be provided by Contractor to illustrate details of a portion of Work.
- .2 The term "design team" means Consultant and Sub-consultants whether Sub-consultants are employees of Consultant or not, and includes structural, mechanical, electrical, etc.

- .3 Indicate materials, methods of construction and attachment or anchorage, erection diagrams, connections, explanatory notes and other information necessary for completion of Work. Where articles or equipment attach or connect to other articles or equipment, indicate that such items have been coordinated, regardless of Section under which adjacent items will be supplied and installed. Indicate cross references to design drawings and specifications.
- .4 Allow fourteen (14) days for Consultant's review of each submission.
- .5 Adjustments made on Shop Drawings by Consultant are not intended to change Contract Price. If adjustments affect value of Work, state such in writing to Consultant prior to proceeding with Work.
- .6 Make changes in Shop Drawings as Consultant may require, consistent with Contract Documents. When resubmitting, notify Consultant in writing of any revisions other than those requested.
- .7 Accompany submissions with transmittal letter, containing:
 - .1 Date.
 - .2 Project title and number.
 - .3 Contractor's name and address.
 - .4 Identification and quantity of each shop drawing, product data and sample.
 - .5 Other pertinent data.
- .8 Submissions shall include:
 - .1 Date and revision dates.
 - .2 Project title and number.
 - .3 Name and address of:
 - .1 Subcontractor.
 - .2 Supplier.
 - .3 Manufacturer.
 - .4 Contractor's stamp, signed by Contractor's authorized representative certifying approval of submissions, verification of field measurements and compliance with Contract Documents.
 - .5 Details of appropriate portions of Work as applicable:
 - .1 Fabrication.
 - .2 Layout, showing dimensions, including identified field dimensions, and clearances.
 - .3 Setting or erection details.
 - .4 Capacities.
 - .5 Performance characteristics.
 - .6 Standards.
 - .7 Operating weight.
 - .8 Wiring diagrams.
 - .9 Single line and schematic diagrams.
 - .10 Relationship to other parts of the Work.
- .9 After Consultant's review, distribute copies.
- .10 Submit Shop Drawings in Pdf. format for each requirement requested in specification Sections and as consultant may reasonably request.
- .11 Submit product data sheets or brochures in Pdf. format for requirements requested in specification sections and as requested by Consultant where Shop Drawings will not be prepared due to standardized manufacture of product.

- .12 Delete information not applicable to project.
- .13 Supplement standard information to provide details applicable to project.
- .14 If upon review by Consultant, no errors or omissions are discovered or if only minor corrections are made, the drawings will be stamped as reviewed or reviewed as modified and will be returned. At this point fabrication and installation of Work may proceed. If Shop Drawings are rejected, noted copy will be returned and re-submission of corrected Shop Drawings, through same procedure indicated above, must be performed before fabrication and installation of Work may proceed.
- .15 Signed drawings shall be returned to and retained by Contractor who is then responsible for distribution of copies of corrected shop drawing to appropriate Subcontractors for appropriate action and to municipal building department for their records of those subjects required by authorities.
- .16 The Consultant's review is for the sole purpose of ascertaining conformance with the general design concept. This review shall not mean the Consultant approves the detail design inherent in the shop drawings, responsibility for which shall remain with the Contractor submitting same, and this review shall not relieve the Contractor of his responsibility for meeting the requirements of the Contract Documents. The Contractor is responsible for dimensions to be confirmed and correlated at the job site for information that pertains solely to fabrication processes or to techniques of construction and installation and for coordination of the work of all subtrades.

1.4. SAMPLES

- .1 Submit for review to the Consultant three (3) samples as requested in respective specification Sections.
- .2 Submit samples with identifying labels bearing material or component description, manufacturer's name and brand name, Contractor's name, project name, location in which material or component is to be used, and date.
- .3 Deliver samples prepay any shipping charges involved for delivering samples to destination point and returning to point of origin if required.
- .4 Provide samples of special products, assemblies, or components when so specified.
- .5 No work requiring a sample submission shall commence until submission has received Consultant's final review.
- .6 Notify Consultant in writing, at time of submission of deviations in samples from requirements of Contract Documents.
- .7 Where colour, pattern or texture is criterion, submit full range of samples.
- .8 Adjustments made on samples by Consultant are not intended to change Contract Price. If adjustments affect value of Work, state such in writing to Consultant prior to proceeding with Work.
- .9 Make changes in samples which Consultant may require, consistent with Contract Documents.
- .10 Reviewed and accepted samples will become standard of workmanship and material against which installed Work will be verified.

1.5. MOCK-UP

- .1 Erect mock-ups to Section 01 45 00.

1.6. CERTIFICATES AND TRANSCRIPTS

- .1 Immediately after award of Contract, and prior to commencing the work submit the performance bond and the labour and materials payment bond as described in the bid documents.
- .2 Submit transcription of certified true copies of insurance immediately after award of Contract.
- .3 A current WSIB clearance certificate
- .4 The bidder's health and safety policy for the project.
- .5 A copy of the notice of project issued by the ministry of labour for the project
- .6 Building materials, components and elements specified without the use of trade or proprietary names shall meet requirements specified. If requested by Consultant, submit evidence of meeting requirements specified. Evidence shall consist of certification based on tests carried out by an independent testing agency. Certification based on previous tests for same materials, components or elements is acceptable. Certification shall be in form of written test reports prepared by testing agency.

END OF SECTION

1.0 GENERAL

1.1. RELATED SECTIONS

- .1 Section 01 14 00 – Work Restrictions.
- .2 Section 01 31 00 - Project Managing and Coordination.
- .3 Section 01 33 00 - Submittal Procedures.
- .4 Section 01 35 23 – Health and Safety
- .5 This section describes requirements applicable to all Sections within Divisions 02 to 49.

1.2. FIRE SAFETY PLAN

- .1 Contractors and their personnel will be familiar with this section and its requirements.
- .2 The contractor must take all necessary precautions during the carrying out of the work to prevent the possibility of fire occurring.

1.3. FIRE PROTECTION

- .1 Provide and maintain temporary fire protection equipment during performance of Work required by the governing codes, regulations and bylaws.
- .2 The contractor will, at all times, when welding, brazing and performing any operation with an open flame, combustible adhesives or flammable solvents keep a portable, operable fire extinguisher within 3 meters of the operation.

1.4. HOT WORK

- .1 Take all precautions to Work safely and to provide the necessary protection to persons and property from Hot Work. This includes, but is not limited to Brazing, Cutting, Grinding, Soldering, Thawing Pipe, Torch Applied Roofing and Welding. With all such activity these steps are to be followed:
 - .1 Whenever possible, complete Hot Work in a welding shop or out of doors at the school.
 - .2 Flammable liquids, dust lint and oily deposits to be removed from within 50-ft (15m) of Work. Remove other combustibles where possible. Otherwise protect with fire-resistive tarpaulins or metal shields.
 - .3 Explosive atmosphere in area eliminated. Floors swept clean. Combustible floors wet down, covered with damp sand or fire-resistive tarpaulins.
 - .4 All wall and floor openings covered. Fire-resistive tarpaulins suspended beneath Work.
 - .5 For on-site Work (indoor and out of doors), advise the Head Custodian, Principal, Consultant (if assigned) and Project Coordinator prior to Work being performed, and of related dangers.
 - .6 Where the Fire Alarm system is required to be set to stand-by to discourage false alarms from smoke detectors provide a firewatch throughout the building or structure being worked on. NEVER put the fire alarm system in stand-by mode when the building is occupied by staff or students.
 - .7 In the event of a fire as a result of the Hot Work, notify the fire department immediately. Report incident to the head custodian, the Consultant, if assigned, and Project Coordinator immediately, whether extinguished or not. Provide a fire incident report to the Board.

- .8 Barriers must be set up to protect staff and students (i.e. pylons, shields, and caution tape) from exposure to arc flash and smoke migration.
- .9 Have all necessary doors, windows and/or drapes closed. Confer with the Head Custodian to shut down all fan systems in the area to reduce or eliminate smoke distribution.
- .10 Provide and keep fire extinguishers handy and in good Working condition. Temporarily cover all smoke detectors in area during time of Work.
- .11 Provide a fire watch/spot check for several hours after Work is completed. Uncover smoke detectors.
- .12 On new construction, the requirements of the Hot Work permit may be waived, until such time as either Substantial Completion or Occupancy is granted, whichever comes first.
- .13 On additions to existing buildings, the requirements for Hot Work permits shall remain in place.

1.5. HOT WORK PERMIT

- .1 **A sample Hot Work Permit is attached to the specifications –**
- .2 Each permit is valid for seven (7) days only and must be renewed prior to its expiration date
- .3 The contractor must obtain Hot Work Permits from the School Board's representative prior to the start of work.
- .4 The contractor must complete the form as required and must keep the form on site.
- .5 Return each completed form to the School Board's representative on date of expiration.
- .6 The most current version of the Permit and it's requirements shall be used for the purposes of the Work.

1.6. FIRE PROTECTION SYSTEMS

- .1 Any Modifications to Fire Alarm system and it's devices including service, additions and changes in device location must be performed only by a Certified Fire Alarm Technician as per the Ontario Fire Code section 1.1, subsection 1.1.5.
- .2 The Contractor will receive from the Board's contact a contact number for the monitoring service and a school system number.
- .3 Bidders are cautioned that the Board will be reimbursed for the cost of false alarms. Refer to Section 01 14 00 Work Restrictions, Para. 1.4.4.
- .4 An approved inspection firm shall verify all new fire alarm devices, in accordance to CSA regulations. Certificate of Verification is required before occupancy.

1.7. FIRE ALARM SHUT-DOWN PROCEDURE

- .1 Do not shut the system down unless necessary. Plan the operation required to reduce system down time to the least amount possible.
- .2 Wherever possible, shut down only the zone needing Work and schedule this down time in unoccupied school hours. Allow for this in your bid pricing.
- .3 Discuss the possible down time with the head custodian and principal prior to any partial or whole system shut down.
- .4 The school or building administration shall advise all staff of fire alarm system shut down. This will include instructions to call 911 if they see a fire and when system is back on line.
- .5 Prior to alarm system shutdown and upon restoring the fire alarm system individuals supervising the shut down must contact Direct Detect at 519-741-2494 and have on hand

the School System Account Number (this number can be found on the decal on the fire alarm panel). The School System Account Number will start with the prefix 209

- .1 The Contractor shall provide full detail to the monitoring company as requested including building number and name (as identified on the fire alarm monitoring panel), contact name, company name, length of time system is down. Call shall be placed just prior to any shut down.
- .6 A fire patrol will need to be established and will include the following at the Contractor's expense:
 - .1 Patrol all halls and high-risk areas affected.
 - .2 Fire patrol shall have access to a phone and call 911 if they see a fire.
 - .3 Report all other problems they encounter.
 - .4 Remain on patrol until system is back on.
- .7 Contact Direct Detect at 519-741-2494 and inform them when the system is put back on line.
- .8 An activated system must not be reset until authorized by the Fire Department and the cause of the alarm has been investigated.

1.8. FIRE PROTECTION EQUIPMENT IMPAIRMENT

- .1 Fire Protection Equipment referred to in this section includes sprinkler systems, special fire suppression systems, and kitchen hood suppression systems.
- .2 The Contractor will take all precautions including restrict all Hot Work operations and shut down hazardous processes during all Fire protection equipment impairment.
- .3 Do not shut the Fire protection equipment down unless necessary Plan the operation required to reduce system impairment time to the least amount possible.
- .4 Wherever possible, shut down only the Fire protection equipment needing Work and schedule this impairment time for unoccupied school hours. Allow for this in your bid pricing.
- .5 Discuss the possible down time with the head custodian and principal prior to any partial or whole system impairment.
- .6 The school administration shall advise all staff of Fire protection equipment shut down. This will include instructions to call 911 if they see a fire and when system is back on line
- .7 The Contractor will plan to use temporary protection such as extra extinguishers, charged hose lines and temporary sprinkler protection during all Fire protection equipment impairment.
- .8 If the sprinkler system is restorable, either in whole or in part, the Contractor or sub-Contractor shall assign someone to restore the system promptly in the event of a fire.
- .9 A fire patrol may need to be established and will include the following at the Contractor's expense:
 - .1 Patrol all halls and high-risk areas affected.
 - .2 Fire patrol shall have access to a phone and call 911 if they see a fire.
 - .3 Report all other problems they encounter.
 - .4 Remain on patrol until system is back on.
- .10 The Contractor shall inform all sub trades that the Board has a Red Tag Permit System and it shall be used for all Fire protection equipment impairment.
- .11 For ease of use, a Factory Mutual hanging wall kit has been place at all Board Fire protection equipment locations. Supplies of Red Tag Permits are provided there.

1.9. FIRE ALARM MODIFICATIONS AND MAINTENANCE

- .1 Very important changes to Ontario Building Code as they relate to the Standard for the Verification of Fire Alarm Systems CAN/ULC-S537-M have taken effect December 24, 1999. (Minister's Ruling 99-BC-01)
 - .1 Clause 5.1; "Addition of conventional field device(s), or modification(s), to existing input circuit(s) or output circuit(s) shall require re-verification of all devices served by those input circuit(s) or output circuit(s)." If one device is added to a zone, the entire zone or in the case of a single zone panel the entire system is to be verified.
 - .2 Clause 5.2 "Addition of input circuit(s) or output circuit(s) to an existing fire alarm system shall require verification of the new circuit(s) in accordance with this standard, and shall also require all previously existing circuit(s) to be tested as follows:
 - .3 TEST: One conventional field device on each circuit shall be operated to confirm activation of all output circuits in accordance with the systems design." Even though no other zones have been touched, one device per input zone is to be tested when the Fire Alarm system is modified.
 - .4 Clause 5.5 "Where a transponder is added to an existing system, the transponder shall be verified in accordance with subsections 3.2, Wiring; and subsection 3.3 Control Units; and with CAN/ULC-S536, Standard for the Inspection and Testing of Fire Alarm Systems as well as re-verification of existing field devices and verification of new conventional field devices." If a new addressable device is added to a system, the new device is to be tested; as well a test must be conducted on all addressable devices on the loop.
 - .5 Clause 5.6 "Where an existing fire alarm system control unit is replaced with a new control unit, it shall be verified in accordance with CAN/ULC-S536, Standard for the Inspection and Testing of Fire Alarm Systems. Replacement of any control panel will require the testing of all existing fire alarm devices.
- .2 The Contractor and sub-Contractors shall include in the bid price for the above ULC Standards requirements referenced in the Ontario Building Code.

1.10. INSTALLATION AND/OR REPAIR OF ROOFING

- .1 The Contractor will review with the Consultant and the Board's representative of the location of any asphalt kettles and the dates the kettles will be in use. The Contractor, in the course of performing roofing work, will ensure all personnel utilize the following precautions:
 - .1 Use only kettles equipped with thermometers or gauges in good working order.
 - .2 Locate kettles in a safe place outside of building.
 - .3 Maintain continuous supervision while kettles are in operation and provide metal covers for the kettles to smother any flames in case of fire.
 - .4 All roofing materials stored in locations no closer than 15 meters to any structures.

1.11. FIRE DEPARTMENT ACCESS

- .1 Designated fire routes must be maintained. Fire Department must be advised of any work that would impede fire apparatus response.

1.12. SMOKING PRECAUTIONS

- .1 Smoking is not permitted anywhere on Board properties. Workers who wish to smoke must leave the property, and not within sight of students. Any worker found to be in contravention of the Ontario Smoke Free Act will be subject to legislated fines.

1.13. FLAMMABLE LIQUIDS

- .1 The handling and storage on site of flammable liquids are to be governed by the current National Fire Code of Canada.
- .2 Flammable liquids such as gasoline, kerosene and naphtha may be kept for ready use in quantities not exceeding 10 imperial gallons provided they are stored in approved safety cans bearing the Underwriter's Laboratory of Canada or Factory Mutual seal of approval.
- .3 Transfer of flammable liquids is prohibited within buildings.
- .4 Transfer of flammable liquids must not be carried out in the vicinity of open flame or any type of heat producing devices.
- .5 Flammable liquids having a flash point below 100° F (37.7°C) such as naphtha or gasoline must not be used as solvents or cleaning agents.
- .6 Flammable waste liquids, for disposal, must be stored in approved containers located in a safe ventilated area. Quantities are to be kept to a minimum.

END OF SECTION

1.0 GENERAL

1.1. RELATED SECTIONS

- .1 Section 01 31 00 - Project Managing and Coordination.
- .2 Section 01 33 00 - Submittal Procedures.
- .3 Section 01 35 17 – Fire Safety Requirements
- .4 Section 01 41 00 – Regulatory Requirements
- .5 Section 01 53 00 – Temporary Construction Facilities
- .6 This section describes requirements applicable to all Sections within Divisions 02 to 49.

1.2. REFERENCES

- .1 Province of Ontario, including requirements for a "Prime Contractor" as defined by the Act.

1.3. SAFETY PLAN

- .1 Develop written site-specific Health and Safety Plan based on hazard assessment prior to commencing any site Work and continue to implement, maintain, and enforce plan until final demobilization from site. Health and Safety Plan must address project specifications.
- .2 Consultant may respond in writing, where deficiencies or concerns are noted and may request re-submission with correction of deficiencies or concerns.
- .3 Be governed by pertinent safety requirements of Federal or Provincial Governments and of municipal bodies having authority, particularly the Ontario Construction Safety Act, The Occupational Health and Safety Act for Ontario, and regulations of Ontario Ministry of Labour, and work in conjunction with proper safety associations operating under the authority of Ontario Workers' Compensation Act. Protect Owner, Owner's employees, the public and those employed on the Work from bodily injury and to protect adjacent public and private property and Owner's property from damage. Furnish and maintain protection, such as warning signs, tarpaulins, guard rails, barriers, guard lights, night lights, railings around shafts, pits and stairwells, etc. as required. Remove temporary protective measures when no longer required.

1.4. TEMPORARY WORK

- .1 Temporary work requiring engineering proficiency for the design, erection, operation maintenance and removal shall be designed and bear stamp of the registered professional Engineer or Architect. Detail drawings will be submitted to the Consultant for review prior to commencing any work.
- .2 Before a temporary structure is used, person responsible for design, or their representative, shall inspect structure and certify it has been constructed according to their design.

1.5. RESPONSIBILITY

- .1 The "Prime Contractor" according applicable local jurisdiction, is responsible for health and safety of persons on site, safety of property on site and for protection of persons adjacent to site and environment to extent that they may be affected by conduct of Work.
- .2 Comply with and enforce compliance by employees with safety requirements of Contract Documents, applicable federal, provincial, territorial and local statutes, regulations, and ordinances, and with site-specific Health and Safety Plan.
- .3 Should any unforeseen or peculiar safety-related factor, hazard, or condition become evident during performance of Work, and follow procedures in place for Employee's Right to

Refuse Work in accordance with Acts and Regulations of Health and Safety Act having jurisdiction. Advise the Board and the Consultant verbally and in writing.

- .4 The Contractor shall make their own arrangements for emergency treatment of accidents. Any accidents shall be reported immediately to the Board contact.
- .5 The Contractor agrees to hold the Board harmless of any and all liability of every nature and description, which may be suffered through bodily injuries, involving deaths of any persons, by reasons of negligence of the Contractor, his agents, employees, or his sub-Contractors.

1.6. SUBMITTALS

- .1 Make submittals in accordance with Section 01 33 00.
- .2 Submit site-specific Health and Safety Plan: Within ten (10) days after date of Notice to Proceed and prior to commencement of Work. Health and Safety Plan must include:
 - .1 Results of site specific safety hazard assessment.
 - .2 Results of safety and health risk or hazard analysis for site tasks and operation
- .3 Submit one (1) copy of Contractor's authorized representative's work site health and safety inspection reports to Consultant and Owner.
- .4 Submit copies of reports or directions issued by Federal, Provincial and Territorial health and safety inspectors.
- .5 Submit copies of incident and accident reports.
- .6 Submit Material Safety Data Sheets (MSDS) to Consultant.
- .7 Consultant's review of Contractor's final Health and Safety plan should not be construed as approval and does not reduce the Contractor's overall responsibility for construction Health and Safety.
- .8 Medical Surveillance: Where prescribed by legislation, regulation or safety program, submit certification of medical surveillance for site personnel prior to commencement of Work, and submit additional certifications for any new site personnel to Consultant.
- .9 On-site Contingency and Emergency Response Plan: Address standard operating procedures to be implemented during emergency situations.
- .10 File Notice of Project with the Ministry of Labour prior to commencement of Work.

1.7. SAFETY ACTIVITIES

- .1 Perform site specific safety hazard assessment related to project.
- .2 Schedule and administer Health and Safety meeting with Consultant prior to commencement of Work.
- .3 Perform Work in accordance with Section 01 41 00 - Regulatory Requirements and this section.

1.8. HEALTH AND SAFETY COORDINATOR

- .1 Employ and assign to Work, competent and authorized representative as Health and Safety Coordinator. Health and Safety Coordinator must:
 - .1 have previous experience as a Health & Safety coordinator,
 - .2 have working knowledge of occupational safety and health regulations,
 - .3 be responsible for completing Contractor's Health and Safety Training Sessions and ensuring that personnel not successfully completing required training are not permitted to enter site to perform Work,
 - .4 be responsible for implementing, enforcing daily and monitoring site-specific Contractor's Health and Safety Plan, and

.5 be on site during execution of Work.

1.9. POSTING OF DOCUMENTS

- .1 Ensure applicable items, articles, notices and orders are posted in conspicuous location on site in accordance with Acts and Regulations of Health and Safety Act having jurisdiction, and in consultation with Consultant.

1.10. CORRECTION OF NON-COMPLIANCE

- .1 Immediately address health and safety non-compliance issues identified by authority having jurisdiction or by Consultant or by the Board.
- .2 Provide Consultant and/or Board with written report of action taken to correct non-compliance of health and safety issues identified.
- .3 Consultant and or the Board may stop Work if non-compliance of health and safety regulations is not corrected.

1.11. PROJECT/SITE CONDITIONS

- .1 Work at site will involve contact with:
 - .1 Refer to Section 01 35 43 Hazardous Materials

1.12. HAZARDOUS WORK

- .1 Blasting or other use of explosives is not permitted at the place of work.

1.13. WORK STOPPAGE

- .1 Give precedence to safety and health of public and site personnel and protection of environment over cost and schedule considerations for Work.

1.14. LOCKOUT PROCEDURES

- .1 All Work to be done on electrical systems or machinery, where the unexpected switching on of the system or machinery could result in personal injury to a student, staff, employee, or the Contractor's employee, must be done in accordance with the Contractor's standard lockout procedure.
- .2 The Contractor shall provide his/her own locks for the above procedure.
- .3 The lock shall include contact information for the person(s) locking out such device.

1.15. OVERHEAD LIFTING

- .1 Under no circumstances will a crane or lifting device be used over a occupied space.
- .2 When working adjacent to occupied spaces, ensure a clearance of one (empty) classroom, or a minimum of 10m between any occupied space and the furthest possible reach of the crane.

1.16. WARNING SIGNS AND NOTICES

- .1 Notices shall be posted advising of the hazard but will not be considered a substitute for providing approved protection, separation, and space from the hazard.

1.17. FIRE PROTECTION

- .1 Provide and maintain temporary fire protection equipment during performance of Work required by the governing codes, regulations and bylaws.

- .2 Burning rubbish and construction waste materials is not permitted on site.
- .3 Maintain placed or installed Fire Protection to protect the portions of the Work during construction.

1.18. SCENT-FREE ENVIRONMENT

- .1 The Board requires that, where advised, a building may be deemed scent-free and as such, the wearing of scented products is prohibited.
- .2 Any methods or materials that are found to create negative responses in staff or students shall cease and be removed under advisement of the Consultant and or the Board, until alternate methods can be determined.

END OF SECTION

1.0 GENERAL

1.1. SECTION INCLUDES

- .1 References and standards.
- .2 Standards producing industry organizations and their addresses.

1.2. RELATED SECTIONS

- .1 Section 01 61 00 – Product Requirements.
- .2 This section describes requirements applicable to all Sections within Divisions 02 to 49.

1.3. REFERENCES

- .1 For Products or quality specified by association, trade, or other references or consensus standards, comply with requirements of the standard, except when more rigid requirements are specified or are required by applicable codes.
- .2 Conform to reference standard by Ontario Building Code except where a specific date is established or required by code.
- .3 Obtain copies of standards where required by product specification sections.
- .4 Neither the contractual relationships, duties, or responsibilities of the parties in Contract nor those of the Consultant shall be altered from the Contract Documents by mention or inference otherwise, in any reference document.

1.4. STANDARDS

- .1 The following associations and organizations are cited in specification sections. Acronym, name, address, and Internet URL addresses are as follows:
- .2 **Canadian Organizations:**
 - .1 **ACEC** - Association of Consulting Engineers of Canada, 130 Albert Street, Suite 616, Ottawa, ON K1P 5G4; URL: <http://www.acec.ca>.
 - .2 **AWMAC** - Architectural Woodwork Manufacturers Association of Canada, 516-4 Street West, High River, AB T1V 1B6; URL: <http://www.awmac.com>.
 - .3 **Canada Green Building Council**, 330 - 55 rue Murray Street, Ottawa, ON. K1N5M3; Tel: 613-241-1184, Fax: 613-241-5750; URL: <http://www.cagbc.org>.
 - .4 **CCA** - Canadian Construction Association, 75 Albert St., Suite 400, Ottawa, ON K1P 5E7; URL: <http://www.cca-acc.com>.
 - .5 **CCDC** – Canadian Construction Documents Committee, Refer to ACEC, CCA, CSC or RAIC; URL: <http://www.CCDC.org>.
 - .6 **CGA** - Canadian Gas Association, 20 Eglinton Avenue West, Suite 1305, Toronto, ON M4R 1K8; URL: <http://www.cga.ca..>
 - .7 **CGSB** - Canadian General Standards Board, Place du Portage, Phase III, 6B1, 11 Laurier Street, Hull, QC K1A 0S5; URL: <http://w3.pwgsc.gc.ca/cgsb>.
 - .8 **CISC** - Canadian Institute of Steel Construction, 201 Consumers Road, Suite 300, Willowdale, ON M2J 4G8; URL: <http://www.cisc-icca.ca>.
 - .9 **CLA** - Canadian Lumbermen's Association, 27 Goulburn Avenue, Ottawa, ON K1N 8C7; URL: <http://www.cla-ca.ca>.
 - .10 **CNLA** - Canadian Nursery Landscape Association, RR #4, Stn. Main, 7856 Fifth Street, Milton, ON L9T 2X8; URL: <http://www.canadanursery.com>.
 - .11 **CRCA** - Canadian Roofing Contractors Association, 155 Queen Street, Suite 1300, Ottawa, ON K1P 6L1; URL: <http://www.roofingcanada.com>.
 - .12 **CSA** - Canadian Standards Association International, 178 Rexdale Blvd., Toronto, ON M9W 1R3; URL: <http://www.csa-international.org>.

- .13 **CSC** - Construction Specifications Canada, 120 Carlton Street, Suite 312, Toronto, ON M5A 4K2; URL: <http://www.csc-dcc.ca>.
- .14 **CSDMA** - Canadian Steel Door Manufacturers Association, One Yonge Street, Suite 1801, Toronto, ON M5E 1W7; URL: <http://www.csdma.org>.
- .15 **CSPI** - Corrugated Steel Pipe Institute, 652 Bishop Street N, Unit 2A, Cambridge, ON N3H 4V6; URL: <http://www.cspi.ca>.
- .16 **CSSBI** - Canadian Sheet Steel Building Institute, 652 Bishop St. N., Unit 2A, Cambridge, ON N3H 4V6; URL: <http://www.cssbi.ca>.
- .17 **CUFCA** - Canadian Urethane Foam Contractor's Association, Box 3214, Winnipeg, MB R3C 4E7; URL: <http://www.cufca.ca>.
- .18 **CWC** - Canadian Wood Council, 1400 Blair Place, Suite 210, Ottawa, ON. K1J 9B8; URL: <http://www.cwc.ca>.
- .19 **EC** - Environment Canada, Conservation and Protection, Inquiry Centre, 351 St. Joseph Blvd, Hull, QC K1A 0H3; URL: <http://www.ec.gc.ca>.
- .20 **EFC** - Electro Federation of Canada, 5800 Explorer Drive, Suite 200, Mississauga, ON L4W 5K9; URL: <http://www.electrofed.com>.
- .21 **MPI** - The Master Painters Institute, 4090 Graveley Street, Burnaby, BC V5C 3T6; URL: <http://www.paintinfo.com>.
- .22 **NABA** - National Air Barrier Association, PO Box 2747, Winnipeg, MB R3C 4E7; URL: <http://www.naba.ca>.
- .23 **NLGA** - National Lumber Grades Authority, 406-First Capital Place, 960 Quayside Drive, New Westminster, BC V3M 6G2; URL: <http://www.nlga.org>.
- .24 **NRC** - National Research Council, Building M-58, 1200 Montreal Road, Ottawa, ON K1A 0R6; URL: <http://www.nrc.gc.ca>.
- .25 **QPL** - Qualification Program List, c/o Canadian General Standards Board, Place du Portage, Phase III, 6B1, 11 Laurier Street, Hull, QC K1A 1G6; URL: <http://www.pwgsc.gc.ca/cgsb>.
- .26 **RAIC** - Royal Architectural Institute of Canada, 55 Murray Street, Suite 330, Ottawa, ON K1N 5M3; URL: <http://www.raic.org>.
- .27 **SCC** - Standards Council of Canada, 270 Albert Street, Suite 2000, Ottawa, ON K1P 6N7; URL: <http://www.scc.ca>.
- .28 **TTMAC** - Terrazzo, Tile and Marble Association of Canada, 30 Capston Gate, Unit 5 Concord, ON L4K 3E8; URL: <http://www.ttmac.com>.
- .29 **ULC** - Underwriters' Laboratories of Canada, 7 Crouse Road, Toronto, ON M1R 3A9; URL: <http://www.ulc.ca>.
- .3 **USA Organizations:**
 - .1 **AA** - Aluminum Association, 900 19th Street N.W., Washington, DC 20006; URL: <http://www.aluminum.org>.
 - .2 **AASHTO** - American Association of State Highway and Transportation Officials, 444 N Capitol Street N.W., Suite 249, Washington, DC 20001; URL: <http://www.aashto.org>.
 - .3 **AHA** - American Hardboard Association, 1210W Northwest Hwy, Palatine, IL 60067; URL: <http://www.hardboard.org>.
 - .4 **AITC** - American Institute of Timber Construction, 7012 S. Revere Parkway, Suite 140, Englewood, CO 80112; URL: <http://www.aitc-glulam.org>.
 - .5 **AMCA** - Air Movement and Control Association Inc., 30 West University Drive, Arlington Heights, IL 60004-1893; URL: <http://www.amca.org>.

- .6 **ANSI** - American National Standards Institute, 25 West 43rd Street, 4th Floor, New York, NY 10036; URL: <http://www.ansi.org>.
- .7 **APA** - The Engineered Wood Association, P.O. Box 11700, Tacoma, WA 98411-0700; URL: <http://www.apawood.org>.
- .8 **API** - American Petroleum Institute, 1220 L St. Northwest, Washington, DC 20005-4070; URL: <http://www.api.org>.
- .9 **ARI** - Air Conditioning and Refrigeration Institute, 4100 N Fairfax Drive, Suite 200, Arlington, VA 22203; URL: <http://www.ari.org>.
- .10 **ASHRAE** - American Society of Heating, Refrigeration and Air-Conditioning Engineers, 1791 Tullie Circle NE, Atlanta, GA 30329; URL: <http://www.ashrae.org>.
- .11 **ASME** - American Society of Mechanical Engineers, ASME Headquarters, 3 Park Avenue, New York, NY 10016-5990; URL: <http://www.asme.org>.
- .12 **ASTM International**, 100 Barr Harbor Drive West, Conshohocken, PA 19428-2959; URL: <http://www.astm.org>.
- .13 **AWCI** - Association of the Wall and Ceiling Industries International, 803 West Broad Street, Suite 600, Falls Church, VA 22046; URL: <http://www.awci.org>.
- .14 **AWPA** - American Wire Producer's Association, 801 N Fairfax Street, Suite 211, Alexandria, VA 22314-1757; URL: <http://www.awpa.org>.
- .15 **AWPA** - American Wood Preservers' Association, P.O. Box 5690, Granbury TX 76049-0690; URL: <http://www.awpa.com>
- .16 **AWS** - American Welding Society, 550 N.W. LeJeune Road, Miami, FL 33126; URL: <http://www.amweld.org>.
- .17 **AWWA** - American Water Works Association, 6666 W. Quincy Avenue, Denver, CO 80235; URL: <http://www.awwa.org>.
- .18 **EIMA** - EIFS Industry Manufacturer's Association, 3000 Corporate Center Drive, Suite 270, Morrow, GA 30260; URL: <http://www.eima.com>.
- .19 **ISAP** - International Society for Asphalt Paving, 400 Selby Avenue, Suite 1, St. Paul, MN 55102; URL: <http://www.asphalt.org>.
- .20 **IEEE** - Institute of Electrical and Electronics Engineers, IEE Corporate Office, 3 Park Avenue, 17th Floor, New York, NY 10016-5997; URL: <http://www.ieee.org>
- .21 **MSS** - Manufacturers Standardization Society of the Valve and Fittings Industry, 127 Park Street, N.E., Vienna, VA 22180-4602; URL: <http://www.mss-hq.com>.
- .22 **NAAMM** - National Association of Architectural Metal Manufacturers, 8 South Michigan Avenue, Suite 1000, Chicago, IL 60603; URL: <http://www.naamm.org>.
- .23 **NEMA** - National Electrical Manufacturers Association, 1300 N 17th Street, Suite 1847, Rosslyn, VA 22209; URL: <http://www.nema.org>.
- .24 **NFPA** - National Fire Protection Association, 1 Batterymarch Park, P.O. Box 9101 Quincy, MA 02269-9101; URL: <http://www.nfpa.org>.
- .25 **NFSA** - National Fire Sprinkler Association, P.O. Box 1000, Patterson, NY 12563; URL: <http://www.nfsa.org>.
- .26 **NHLA** - National Hardwood Lumber Association, 6830 Raleigh-La Grange Road, Memphis, TN 38184-0518; URL: <http://www.natlhardwood.org>.
- .27 **NSPE** - National Society of Professional Engineers, 1420 King Street, Alexandria, VA 22314-2794; URL: <http://www.nspe.org>.
- .28 **PCI** - Prestressed Concrete Institute, 209 W. Jackson Blvd., Suite 500, Chicago, IL 60606-6938; URL: <http://www.pci.org>.

- .29 **PEI** - Porcelain Enamel Institute, PO Box 920220, Norcross, GA 30010; URL: <http://www.porecelainenamel.com>.
- .30 **SSPC** - The Society for Protective Coatings, 40 24th Street, 6th Floor, Pittsburgh, PA 15222-4656; URL: <http://www.sspc.org>.
- .31 **TPI** - Truss Plate Institute, 583 D'Onofrio Drive, Suite 200, Madison, WI 53719; URL: <http://www.tpinst.org>.
- .32 **UL** - Underwriters' Laboratories, 333 Pfingsten Road, Northbrook, IL60062-2096; URL: <http://www.ul.com>.

END OF SECTION

1.0 GENERAL

1.1. RELATED SECTIONS

- .1 Section 01 21 00 - Allowances.
- .2 Section 01 78 10 – Closeout Submittals and Requirements
- .3 Section 01 79 00 – Demonstration and Training
- .4 This section describes requirements applicable to all Sections within Divisions 02 to 49.

1.2. REFERENCES

- .1 **ISO/IEC 17025-2005** - General Requirements for the Competence of Testing and Calibration Laboratories.
- .2 **SCC** (Standards Council of Canada).

1.3. INSPECTION BY AUTHORITY

- .1 Allow Authorities Having Jurisdiction access to Work. If part of Work is in preparation at locations other than Place of Work, allow access to such Work whenever it is in progress.
- .2 Give timely notice requesting inspection whenever portions of the Work are designated for special tests, inspections or approvals, either when described in the Contract Documents or when required by law in the Place of the Work.
- .3 If Contractor covers or permits to be covered Work that has been designated for special tests, inspections or approvals before such is made, uncover such Work, have inspections or tests satisfactorily completed and make good such Work.

1.4. REVIEW BY CONSULTANT

- .1 Consultant may order any part of the Work to be reviewed or inspected if Work is suspected to be not in accordance with Contract Documents.
- .2 If, upon review such work is found not in accordance with Contract Documents, correct such Work and pay cost of additional review and correction.
- .3 If such Work is found in accordance with Contract Documents, The owner will pay cost of review and replacement.

1.5. INDEPENDENT INSPECTION AGENCIES

- .1 Independent Inspection and Testing Agencies will be engaged by Contractor for purpose of inspecting and testing portions of Work.
- .2 The Board may, at their discretion, request that the Consultant direct the Contractor to engage independent inspecting and or testing agencies to review or test the Work.
- .3 Allocate Costs for inspections and testing to Section 01 21 00.
- .4 Provide equipment required for executing inspection and testing by appointed agencies.
- .5 Employment of inspection and testing agencies does not relax responsibility to perform Work in accordance with Contract Documents.
- .6 If defects are revealed during inspection and/or testing, the appointed agency will request additional inspection and testing to ascertain full degree of defect. Correct defect and irregularities as advised by Consultant at no cost to Owner. Contractor shall pay costs directly to the inspection agency for retesting and re-inspection.

1.6. ACCESS TO WORK

- .1 Allow inspection and testing agencies access to Work, off site manufacturing and fabrication plants.
- .2 Cooperate to provide reasonable access and facilities for such access.

1.7. CONTRACTOR RESPONSIBILITIES

- .1 Notify appropriate agency minimum 48 hours in advance of requirement for tests, in order that attendance arrangements can be made.
- .2 Submit samples and 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 Work.
- .3 Provide labour and facilities to obtain and handle samples and materials on site. Provide sufficient space to store and cure test samples.

1.8. DUTIES & AUTHORITY OF TESTING AGENCY

- .1 Testing agency is expected to do the following:
 - .1 Act in a professional and unprejudiced basis and carry out inspection and testing functions to establish compliance with requirements of Contract Documents.
 - .2 Check work as it progresses and prepare reports stating results of tests and conditions of work and state in each report whether specimens tested conform to requirements of Contract Documents, specifically noting deviations.
 - .3 Distribute reports as follows
 - .1 Consultant
 - .2 Owner
 - .3 Contractor
- .2 Testing agency is not authorized to amend or release any requirements of Contract Documents, nor to approve or accept any portion of work.

1.9. REJECTED WORK

- .1 The Contractor shall remove defective Work, whether result of poor workmanship, use of defective products or damage and whether incorporated in Work or not, which has been rejected by Consultant as failing to conform to Contract Documents. Replace or re-execute in accordance with Contract Documents.
- .2 Make good other Contractor's work damaged by such removals or replacements promptly.
- .3 If, it is not expedient to correct defective Work or Work not performed in accordance with Contract Documents, the Owner may choose to accept the condition. The difference in value between Work performed and that called for by Contract Documents shall be deducted from the Contract value via Change Order. The amount of this change shall be determined by Consultant. The Contractor shall warrant the work performed for the time period specified as if it were performed in accordance with the Contract Documents.

1.10. TESTING OF EXCAVATION & BACK FILL

- .1 Not Applicable

1.11. CONCRETE STRENGTH TESTS

- .1 Not Applicable

1.12. INSPECTION OF STRUCTURAL STEEL

- .1 Ensure all steel has mill test reports that comply with the Specification prior to purchase.
- .2 Inspect fabrication of steel in plant.
- .3 Inspect erection work at site including fit-up, placing, plumbing, levelling, temporary bracing, field cutting and alterations.
- .4 Shop and field inspect welded and bolted connections and painting.
- .5 High strength bolts - the installation and testing of bolts shall conform to the requirements of CSA S16-1969. Check one representative connection in ten by torque testing every bolt, and check each bolt in every connection with a tap of hammer for soundness. Enforce requirements of connection type.
- .6 Examine visually all welded joints for inclusions, porosity, lack of fusion penetration or even contour, undercuts and cracks. Root passes shall be checked for penetration and cracks from the back of the joint. Any suspect welds shall be checked ultrasonically.

1.13. INSPECTION OF METAL DECK

- .1 Not Applicable

1.14. INSPECTION AND TESTING OF PAVING

- .1 Not Applicable

1.15. BUILDING THERMOGRAPHIC SCAN

- .1 Upon completion of the Work, the Consultant and/or Owner may arrange for an independent agency to carry out a thermographic scan of the building to determine acceptability of thermal performance of the building envelope.
- .2 Contractor shall carry out remedial work as required to bring quality of any rejected portion of the building envelope to that of the sample area. Contractor shall pay for costs of any follow-up thermographic scans required to determine acceptability of remedial work. This procedure shall be repeated until all parts of the building envelope have been accepted.

1.16. TESTS AND MIX DESIGNS

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

1.17. MOCK-UP

- .1 Prepare mock-up for Work specifically requested in specifications. Include for Work of all Sections required to provide mock-ups.
- .2 Prepare mock-ups for Consultants review with reasonable promptness and in an orderly sequence, so as not to cause any delay in Work.
- .3 Failure to prepare mock-ups 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.
- .4 If requested, Consultant will assist in preparing a schedule fixing dates for preparation.

- .5 Remove mock-up at conclusion of Work or when acceptable to Consultant. Repair any damage and clean-up at place of mock-up.
- .6 Approved mock-up may remain as part of Work.

1.18. EQUIPMENT AND SYSTEMS

- .1 Submit adjustment and balancing reports for mechanical and electrical systems to the consultant.
- .2 Refer to Sections 01.78.10 and 01.79.00 for definitive requirements.

END OF SECTION

1.0 GENERAL

1.1. RELATED SECTIONS

- .1 Section 01 52 00 - Construction Facilities.
- .2 Section 01 53 00 - Temporary Construction.
- .3 This section describes requirements applicable to all Sections within Divisions 02 to 49.

1.2. INSTALLATION AND REMOVAL

- .1 Provide temporary utilities controls in order to execute work expeditiously.
- .2 Location of temporary facilities shall be subject to Consultant's approval.
- .3 Salvage and assist in recycling products for potential reuse wherever possible.
- .4 Remove temporary facilities from site when directed by consultant.

1.3. DEWATERING

- .1 Provide temporary drainage and pumping facilities to keep excavations and site free from standing water. Provide necessary pumps (including spare pumps) and temporary drainage for keeping the Work free of water throughout construction period. Locate sumps away from foundation elements. Control grading around excavation to prevent surface water from draining into excavation and from damaging adjoining property.
- .2 Provide dry mix low slump concrete mud slabs as required to provide suitable barrier for installation of concrete footings and to maintain construction schedule. Consult with Geotechnical Engineer prior to installation.

1.4. WATER SUPPLY

- .1 Provide continuous supply of potable water for construction use until such time as permanent municipal water supply is available.
- .2 Hose extensions to be provided by subcontractors requiring them.
- .3 Arrange for connection with appropriate utility company and pay all costs for installation, maintenance, removal and usage costs until occupancy has been achieved.

1.5. TEMPORARY HEATING AND VENTILATION

- .1 Provide temporary heating, including all unit rental costs and maintenance required during construction period including for winter protection.
- .2 Provide temporary heating fuel until such time as a permanent natural gas line is installed. The Contractor shall provide all connections and piping between the permanent fuel source and the heating appliance(s).
- .3 Provide temporary heat and ventilation in enclosed areas as required to:
 - .1 Facilitate progress of Work.
 - .2 Protect Work and products against dampness and cold including winter protection.
 - .3 Prevent moisture condensation on surfaces.
 - .4 Provide ambient temperatures and humidity levels for storage, installation and curing of materials.
 - .5 Provide adequate ventilation to meet health regulations for safe working environment.
- .4 Maintain temperatures of minimum:
 - .1 10 degrees C in areas where construction is in progress, until takeover by Board. Contractor to ensure temporary enclosures remain sealed and penetrations are repaired or closed in a timely fashion.

- .2 16 degrees C in areas where finishes are in progress.
- .3 16 degrees C in building once it is enclosed.
- .4 Refer to other Sections for intermittent heating requirements up to 21 degrees C. Provide insulated tarp enclosures for openings as required to enclose the building after completion of main building shell components and roof.
- .5 If the Contractor fails to ensure the temporary enclosures remained sealed (including temp doors when not in use) the Consultant and or the Board shall require the contractor to pay 40% of that months usage charge
- .5 Use forced hot air heaters. Open-flame type heaters or salamanders are not permitted. Ventilate direct fired heating units to the outside.
- .6 Uniformly distribute heat to avoid hot and cold areas and to prevent excessive drying.
- .7 Early heating of the building shell will be required to expedite interior finishing to meet the project schedule.
- .8 Ventilating:
 - .1 Prevent accumulations of dust, fumes, mists, vapours or gases in areas occupied during construction.
 - .2 Provide local exhaust ventilation to prevent harmful accumulation of hazardous substances into atmosphere of occupied areas.
 - .3 Dispose of exhaust materials in manner that will not result in harmful exposure to persons.
 - .4 Ventilate storage spaces containing hazardous or volatile materials.
 - .5 Ventilate temporary sanitary facilities.
 - .6 Continue operation of ventilation and exhaust system for time after cessation of work process to assure removal of harmful contaminants.
 - .7 Provide minimum 1 air change per hour for enclosed areas receiving architectural finishes.
 - .8 Do not allow excessive build-up of moisture inside building.
- .9 The permanent mechanical systems for the new building, when installed in safe operating conditions, may be used for temporary heating or cooling if approved in writing by the Consultant, without penalty to the warranty.
- .10 Follow the requirements of "Temporary Use of New Permanent Services and Equipment" if the permanent heating system installed under the contract is intended to be used for temporary heating during the construction.
- .11 Provide competent persons to operate and maintain permanent systems for duration of temporary use period.
- .12 Perform required repairs and maintenance immediately after each inspection. Pay for operating costs. Upon termination of temporary use period, services and equipment shall be inspected, tested, adjusted, fitters replaced, balanced, cleaned and lubricated.
- .13 Permanent services and equipment shall be turned over to Owner in new and perfect operating condition.
- .14 Use of permanent systems and equipment as temporary facilities shall not affect the guarantee conditions and guarantee period for such systems and equipment. Make due allowance to ensure Owner will receive full benefits of equipment manufacturer's warranty from the date of Substantial Performance.
- .15 Ensure date of Substantial Performance of the Work and Warranties for heating system do not commence until entire system is in as near original condition as possible and is certified by Consultant.

- .16 Maintain strict supervision of operation of temporary heating and ventilating equipment to:
 - .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.
- .17 Be responsible for damage to Work due to failure in providing adequate heat and protection during construction.

1.6. TEMPORARY POWER AND LIGHT

- .1 Provide temporary electrical service and system including lighting and power system for use by all Sections.
- .2 Contractor will provide a source for, and pay the costs of temporary power during construction for temporary lighting and operating of power tools until such time as permanent source is available.
- .3 Contractor to ensure that the use of power from a source provided by the Board shall not exceed the capacity of the current use required for the operation of any existing facility.
- .4 Install and maintain temporary electrical service and systems in accordance with Construction Safety Association's "Temporary Wiring Standards on Construction Sites", the Ontario Electrical Code and other authorities having jurisdiction.
- .5 Provide at least one temporary panel on each floor with service capacity suitable for construction requirements and to authorities and utilities approval.
- .6 Provide temporary wiring with lighting to all areas of each floor to provide adequate lighting.
 - .1 Lighting levels must be maintained at a minimum of 10 foot candles, or to suit the particular location or operation, whichever is greater.
 - .2 Do not use materials of the temporary service in permanent installation.
 - .3 Increase lighting levels equivalent to the final requirements when finishing operations are underway.
- .7 Extension cords, lights, etc., required by various subcontractors and run from above outlet positions will be supplied and maintained by the party or parties requiring same.
- .8 Follow requirements of "Temporary Use of New Permanent Services and Equipment" if electrical power and lighting systems installed under the contract are intended to be used for temporary electricity and lighting during the construction.
- .9 Electrical power and lighting systems installed under this contract can be used for construction provided damages are made good and all lamps that have been used for more than two months are replaced with new lamps.
- .10 For New Builds arrange for connection with appropriate utility company and pay all costs for installation, maintenance, removal and usage costs until occupancy has been achieved.
- .11 For Additions and renovations the contractor can use existing Board service unless noted otherwise.
- .12 Provide and pay for temporary power for electric cranes and other equipment requiring temporary power in excess of above noted requirements.
- .13 Provide and pay for temporary power for electric cranes and other equipment requiring temporary power in excess of above noted requirements.
- .14 Where Contractor elects to use diesel or gas fueled generators to provide temporary power, Contractor will be responsible for all costs incurred including but not limited to temporary

pad, fuel, unit rental costs, and provision of robust soundproof enclosures or barriers to minimize noise transfer to immediate neighbors.

1.7. TEMPORARY COMMUNICATION FACILITIES

- .1 Contractor to provide and pay for temporary Phone, e-mail and printer hook up, for the duration of contract until completion for use by the contractor.
- .2 The site superintendent is to have e-mail access and a printer on site.

END OF SECTION

1.0 GENERAL

1.1. RELATED SECTIONS

- .1 Section 01 51 00 - Temporary Utilities.
- .2 Section 01 35 23 – Health and Safety
- .3 This section describes requirements applicable to all Sections within Divisions 02 to 49.

1.2. INSTALLATION AND REMOVAL

- .1 Provide temporary construction facilities in order to execute work expeditiously.
- .2 Remove temporary facilities from site when directed by Consultant.

1.3. PROTECTION FOR OFF-SITE AND PUBLIC PROPERTY

- .1 Protect surrounding private and public property from damage during performance of Work.
- .2 Be responsible for damage incurred.

1.4. PROTECTION OF SURROUNDING WORK

- .1 Provide protection for finished and partially finished Work from damage.
- .2 Provide necessary cover and protection.
- .3 Be responsible for damage incurred due to lack of or improper or inappropriate protection.

1.5. ROOF AND STRUCTURE PROTECTION

- .1 Ensure no part of Work or existing structures are subjected to a load, which will endanger its safety or will cause permanent deformation.
- .2 The Contractor when indicated by the Board Contact or Consultant shall provide roof protection. Ensure all precautions are taken to avoid liability for roof damage.
- .3 Typical roof protection shall consist of a layer of 1inch rigid foam insulation set directly on the roof surface and a layer of 19 mm (3/4 inch) plywood in all places under scaffold legs, ladder legs and in areas of foot traffic or falling debris.

1.6. WORK SITE ENCLOSURE & SAFETY BARRIERS

- .1 Erect and maintain for the duration of the work:
 - .1 a minimum 1800 mm high chain link fence or self-supporting, heavy duty, interconnected fence panels (commonly referred to as Insta-fence) for a temporary site enclosure (hoarding) completely around perimeter of work site,
 - .2 any temporary posts shall be completely removed by the contractor prior to occupancy,
 - .3 under no circumstance shall t-bar posts be used on board property
 - .4 any additional safety devices including full hoarding as required and noted on the drawings, to protect the students, staff, public and private property from injury and damage,
 - .5 any additional requirements as regulated by authorities having jurisdiction, local by-laws and zoning.
- .2 The Contractor is to assume full responsibility for any injury or damage caused due to failure to comply with Paragraph 1 above.
- .3 Any hazardous conditions identified outside of the main fenced area will be barricaded with a fence complying to the above.

- .4 Provide lockable truck entrance gate/gates and at least one (1) pedestrian door as directed and conforming to applicable traffic restrictions on adjacent streets. Equip gates with locks and keys with restricted availability, in the project office.
- .5 Erect and maintain pedestrian walkways including roof and side covers, complete with signs and electrical lighting as required by law.
- .6 Provide barriers around trees and plants designated to remain.
- .7 Protect from damage by equipment and construction procedures.

1.7. TREE PROTECTION

- .1 Protect all existing trees to remain from damage during construction period. Make good, at Contractor's expense, trees damaged during construction.
- .2 Confine movement of heavy equipment, storage of same, and storage of materials to a predetermined area. Do not store materials or place equipment over root systems of any existing trees to remain.
- .3 Install fencing or approved equal at limits of drip line of existing trees to remain unless directed otherwise. Where this case is not practical, and only if approved by the Consultant, the trunks shall be protected with an approved tree guard.
- .4 No rigging cables shall be wrapped around or installed in trees. Do not flush concrete trucks or cement mixing machines over root systems or near trees. Flush concrete trucks or cement mixing machines in areas approved by Consultant.
- .5 Areas where root systems of trees are exposed directly adjacent to a structure will be backfilled with good loam only.
- .6 Whenever excavating is required within branch spread of trees that are to remain, the contractor shall contact the consultant for direction prior to the start of work.
- .7 If any existing tree to remain is injured and does not survive the following year, it will, as determined by the Board, be removed in its entirety and be replaced with a tree of similar size and value, as directed by the Consultant.
- .8 Should the destroyed tree be of such a size or shape that it cannot be feasibly replaced, the Contractor shall compensate the Owner for the minimum sum of five thousand dollars (\$5,000.00) per destroyed tree.

1.8. GUARD RAILS AND BARRIERS

- .1 Provide secure, rigid guard rails and barricades around deep excavations, open shafts, open stair wells, open edges of floors and roofs.
- .2 Erect and maintain for the duration of the Work, safety devices and barricades including hoarding, as required, to protect the staff, students, public and private property, from injury and damage.
- .3 The Contractor is to ensure that all requirements from authorities having jurisdiction and all requirements from the Owner are met.
- .4 The Contractor is to assume full responsibility for any damage caused due to his failure to comply with paragraph 2 above.
- .5 Hazardous conditions on the exterior shall be fenced.

1.9. WEATHER ENCLOSURES

- .1 Provide weather tight closures to unfinished door and window openings, tops of shafts and other openings in floors and roofs.

- .2 Close off floor areas where walls are not finished; seal off other openings; enclose building interior work for temporary heat.
- .3 Provide heated enclosures required for winter protection of all work already completed or underway.
- .4 Design enclosures to withstand wind pressure.

1.10. DUST TIGHT BARRIERS

- .1 Provide dust tight barriers and screens or partitions to localize dust generating activities, and for protection of workers, finished areas of Work and public.
- .2 Maintain and relocate protection until such work is complete.
- .3 Where required adjust air handling units to eliminate migration of dust.

1.11. SCAFFOLDING

- .1 Erect scaffolding independent of walls and use in such a manner limiting interference with other work. When not in use, move scaffolding as necessary to permit installation of other work. Construct and maintain scaffolding in a rigid, secure and safe manner. Remove it promptly when no longer required. Protect surface on which scaffolding is bearing.

1.12. SHORING, BRACING, PILING

- .1 Provide shoring, bracing, piling, sheeting and sheet piling and underpinning required to support soil banks, existing work and property in accordance with Construction Safety Act and other applicable regulations. Maintain shoring until building is strong enough and sufficiently braced to withstand pressure of backfilling. Make construction aids free of permanent work so they may be removed entirely when no longer required, without damaging the Work. Locate construction aids so adequate room is left for damp-proofing foundation walls, laying substructure drainage and other work.
- .2 Shoring and false work over one tier in height shall be designed and shall bear the stamp of a registered professional engineer, having experience in this field.

1.13. HOISTING

- .1 Provide, operate and maintain services required for moving of workers, materials and equipment. Make financial arrangements with Subcontractors for use thereof.
- .2 Machinery shall be operated by qualified operator.

1.14. OVERHEAD LIFTING

- .1 Any condition requiring the use of a crane or lifting device over a Board structure must follow the requirements of Health and Safety Section 01 35 23, Paragraph 1.15 Overhead Lifting.

1.15. ELEVATORS/LIFTS - Reserved

1.16. USE OF THE WORK

- .1 Confine work and operations of employees by Contract Documents. Do not unreasonably encumber premises with Products.
- .2 Do not load or permit to load any part of Work with a weight or force that will endanger the Work.

1.17. CONSTRUCTION PARKING

- .1 Construction personnel vehicle parking, to be confined to the work site enclosure, or.
- .2 Permission to park vehicles on site does not imply any liability or responsibility for safe keeping of vehicles and contents thereof by the School Board.

1.18. ACCESS TO SITE

- .1 Provide and maintain adequate access to project site.
- .2 Build and maintain temporary roads where necessary and provide snow removal within the area of work, and access to the work, during period of Work. The area shall be restored to the satisfaction of the Board at the completion of the project.
- .3 If authorized to use existing roads for access to project site, maintain such roads for duration of Contract and make good damage resulting from Contractors' use of roads.
- .4 Clean roadways and taxi areas where used by Contractor's equipment.

1.19. SECURITY

- .1 The Contractor shall ensure the security of the work site, contents, and built structures for the duration of the project.
- .2 The Contractor shall be responsible to provide and pay for security personnel to guard site and contents of site after working hours and during holidays as required.
- .3 Notify the Board of the use of security guards or systems.
- .4 The Board shall not be responsible for the loss, theft, or vandalism.

1.20. OFFICES

- .1 Provide and maintain, until completion of Contract, for Contractor's use, a temporary office, large enough to accommodate site administrative activities and site meetings, complete with light, heat, air conditioning, ventilation, table and chairs. Do not store materials in office area; keep clean and tidy.
- .2 Provide a clearly marked and fully stocked first-aid case in a readily available location.
- .3 Subcontractors may provide their own offices as necessary. Direct location of these offices.

1.21. EQUIPMENT, TOOL AND MATERIALS STORAGE

- .1 Provide and maintain, in a clean and orderly condition, lockable weatherproof sheds and platforms for storage of tools, equipment and materials.
- .2 Review storage areas on site with the Consultant. Store materials and equipment to ensure preservation of quality of product and fitness for the Work. Store materials and equipment on wooden platforms or other hard, clean surfaces, raised above the ground or in water tight storage sheds of sufficient size for storage of materials and equipment which might be damaged by storage in open. Locate stored materials and equipment to facilitate prompt inspection.
- .3 Store packaged materials and equipment undamaged, in their original wrappings or containers, with manufacture's labels and seals intact.
- .4 Locate materials not required to be stored in weatherproof sheds on site in a manner to cause least interference with work activities.
- .5 Storage sheds required by subcontractors shall be provided by them.

1.22. SANITARY FACILITIES

- .1 Provide weatherproof temporary toilet/sanitary facilities for work force in accordance with governing regulations and ordinances.
- .2 Service temporary toilet/sanitary facilities as required by authorities but not less than weekly.
- .3 Post notices and take such precautions as required by local health authorities.
- .4 Except where connected to municipal sewer system, periodically remove wastes from Site.
- .5 Keep toilet/sanitary facilities clean and sanitary and protect from freezing.
- .6 Keep sanitary facilities clean and fully stocked with the necessary supplies at all times.

END OF SECTION

1.0 GENERAL

1.1. RELATED SECTIONS

- .1 This section describes requirements applicable to all Sections within Divisions 02 to 49.
- .2 Section 01 31 00 – Project Managing and Coordination

1.2. TERMINOLOGY

- .1 New: Produced from new materials.
- .2 Renewed: Produced or rejuvenated from an existing material to like-new condition to serve a new or existing service.
- .3 Defective: A condition determined exclusively by the Consultant.

1.3. PRODUCT QUALITY

- .1 The term 'new' in the following paragraph does not exclude re-manufactured products that have some or all of the materials recycled from other sources. Preference in recycling is for post-consumer recycled materials.
- .2 Products, materials, equipment, parts or assemblies (referred to as Products) incorporated in Work:
- .3 New Product, not damaged or defective, of best quality (compatible with specification requirements) for purpose intended. If requested, provide evidence as to type, source and quality of Products provided.
- .4 Defective Products, whenever identified prior to completion of Work, will be rejected, regardless of previous inspections. Inspection does not relieve responsibility, but is precaution against oversight or error. Remove and replace defective Products at own expense and be responsible for delays and expenses caused by rejection.
- .5 Should any dispute arise as to quality or fitness of Products, decision rests strictly with Consultant.
- .6 Unless otherwise indicated in specifications, maintain uniformity of manufacture for any particular or like item throughout building.

1.4. AVAILABILITY

- .1 Immediately upon receipt of Boards Purchase Order, review Product delivery requirements and anticipate foreseeable supply delays for any items.
- .2 Immediately upon receipt of Boards Purchase Order the Contractor shall issue Purchase Orders and or Contracts to all Sub-trades. Provide proof to the Consultant and the Board within 3 days. The Sub-Contractors shall identify in writing any delivery issues within 14 days of receiving the Contractors purchase order or contract. The Schedule noted in 01-31 00 1.7.1 shall incorporate all deliveries and installation.
- .3 If delays in supply of Products are foreseeable, notify Consultant of such, in order that substitutions or other remedial action may be authorized in ample time to prevent delay in performance of Work.
- .4 In event of failure to notify Consultant at commencement of Work and should it subsequently appear that Work may be delayed for such reason, Consultant reserves right to substitute more readily available Products of similar character, at no increase in Contract Price or Contract Time.

1.5. STORAGE AND PROTECTION

- .1 Store and protect Products in accordance with manufacturers' written instructions.
- .2 Store with seals and labels intact and legible.
- .3 Store sensitive Products in weather tight, climate controlled, enclosures in an environment favourable to Product.
- .4 For exterior storage of fabricated Products, place on sloped supports above ground.
- .5 Cover Products subject to deterioration with impervious sheet covering. Provide ventilation to prevent condensation and degradation of Products.
- .6 Store loose granular materials on solid flat surfaces in a well-drained area. Prevent mixing with foreign matter.
- .7 Provide equipment and personnel to store Products by methods to prevent soiling, disfigurement, or damage.
- .8 Arrange storage of Products to permit access for inspection. Periodically inspect to verify Products are undamaged and are maintained in acceptable condition.

1.6. TRANSPORTATION AND HANDLING

- .1 Transport and handle Products in accordance with manufacturer's written instructions.
- .2 Promptly inspect shipments to ensure that Products comply with requirements, quantities are correct, and Products are undamaged.
- .3 Provide equipment and personnel to handle Products by methods to prevent soiling, disfigurement, or damage.
- .4 Suitably pack, crate and protect products during transportation to site to preserve their quality and fitness for the purpose intended.
- .5 Store products in original, undamaged condition with manufacturer's labels and seals intact until they are being incorporated into completed work.
- .6 Protect materials from damage by extreme temperatures or exposure to the weather.

1.7. EXISTING UTILITIES

- .1 When breaking into or connecting to existing services or utilities, execute Work at times directed by local governing authorities, with minimum of disturbance to the owner.
- .2 Protect, relocate or maintain existing active services. When services are encountered, cap off in manner approved by authority having jurisdiction. Stake and record location of capped service.

1.8. MANUFACTURER'S WRITTEN INSTRUCTIONS

- .1 Unless otherwise indicated in specifications, install or erect Products to manufacturer's written instructions. Do not rely on labels or enclosures provided with Products. Obtain written instructions directly from manufacturers.
- .2 Notify Consultant in writing, of conflicts between specifications and manufacturer's instructions, so that Consultant may establish course of action.
- .3 Improper installation or erection of Products, due to failure in complying with these requirements, authorizes Consultant to require removal and re-installation at no increase in Contract Price or Contract Time.

1.9. QUALITY OF WORK

- .1 Ensure Quality of Work is of highest standard, executed by workers experienced and skilled in respective duties for which they are employed. Immediately notify Consultant if required Work is such as to make it impractical to produce required results.
- .2 Do not employ anyone unskilled in their required duties. Consultant and or Board reserves right to require dismissal from site any workers deemed incompetent or careless.
- .3 Decisions as to standard or fitness of Quality of Work in cases of dispute rest solely with Consultant, whose decision is final.
- .4 Products, materials, systems and equipment shall be applied, installed, connected, erected, used, cleaned and conditioned in accordance with the applicable manufacturer's printed directions.
- .5 Where specified requirements are in conflict with manufacturer's written directions, follow manufacturer's directions. Where specified requirements are more stringent than manufacturer's directions, comply with specified requirements.

1.10. COORDINATION

- .1 Ensure cooperation of workers in laying out Work. Maintain efficient and continuous supervision.
- .2 Be responsible for coordination and placement of openings, sleeves and accessories.
- .3 Contractor is responsible to ensure suppliers or distributors of materials specified or alternatives accepted, which he intends to use, have materials with original schedule, and similarly it shall be the responsibility of all subcontractors and suppliers to so inform the Contractor.
- .4 Contractor shall contact Consultant immediately upon receipt of information indicating materials or items, will not be available on time, in accordance with the latest approved schedule, and similarly it shall be the responsibility of all subcontractors and suppliers to so inform the Contractor.
- .5 The above, in no way releases the Contractor, or their subcontractors and suppliers of their responsibility for ensuring timely ordering of materials and items required, including the necessary expediting, to complete the Work as scheduled in accordance with the Contract Documents including temp accommodations and or materials to ensure occupancy date is achieved.

1.11. CONCEALMENT

- .1 In finished areas, conceal pipes, ducts and wiring in floors, walls and ceilings, except where indicated otherwise.
- .2 Before installation, inform Consultant if there is interference. Install as directed by Consultant at no additional cost to the Board.

1.12. REMEDIAL WORK

- .1 Perform remedial work required to repair or replace parts or portions of Work identified as defective or unacceptable. Coordinate adjacent affected Work as required.
- .2 Perform remedial work by specialists familiar with materials affected. Perform in a manner to neither damage nor put at risk any portion of Work.

1.13. LOCATION OF FIXTURES

- .1 Inform Consultant of conflicting installation. Install as directed.

1.14. FASTENINGS - EQUIPMENT

- .1 Use fastenings of standard commercial sizes and patterns with material and finish suitable for service.
- .2 Use heavy hexagon heads, semi-finished unless otherwise specified. Use Type 304 or 316 stainless steel for exterior areas.
- .3 Bolts may not project more than one diameter beyond nuts.
- .4 Use plain type washers on equipment, sheet metal and soft gasket lock type washers where vibrations occur. Use resilient washers with stainless steel.

1.15. PROTECTION OF WORK IN PROGRESS

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

END OF SECTION

1.0 GENERAL

1.1. RELATED SECTIONS

- .1 This section describes requirements applicable to all Sections within Divisions 02 to 49.

1.2. REFERENCES

- .1 Owner's identification of existing survey control points and property limits.

1.3. SUBMITTALS

- .1 Submit name and address of Surveyor to Consultant.
- .2 On request of Consultant, submit documentation to verify accuracy of field engineering work.
- .3 Submit certificate signed by surveyor certifying that elevations and locations of completed Work conforms with Contract Documents.

1.4. QUALIFICATIONS OF SURVEYOR

- .1 Qualified registered land surveyor, licensed to practise in the Place of the Work.

1.5. SURVEY REFERENCE POINTS

- .1 Existing base horizontal and vertical control points are designated on Drawings.
- .2 Locate, confirm and protect control points prior to starting site Work. Preserve permanent reference points during construction.
- .3 Make no changes or relocations without prior written notice to Consultant.
- .4 Report to Consultant when reference point is lost or destroyed, or requires relocation because of necessary changes in grades or locations.
- .5 Require surveyor to replace control points in accordance with original survey control.

1.6. SURVEY REQUIREMENTS

- .1 Establish existing and new permanent bench marks on site, referenced to established bench marks by survey control points.
- .2 Record locations, with horizontal and vertical data in Project Record Documents.
- .3 Establish lines and levels, locate and lay out, by instrumentation.
- .4 Establish pipe invert elevations.
- .5 Stake batter boards
- .6 Establish foundation and floor elevations.
- .7 Establish lines and levels for mechanical and electrical work.

1.7. SUBSURFACE CONDITIONS

- .1 Promptly notify Consultant in writing if discovered surface or subsurface conditions at Place of Work differ materially from those indicated in Contract Documents.
- .2 Advise the Consultant of a reasonable assumption of probable conditions when determined.
- .3 After prompt investigation, should Consultant determine that conditions do differ materially, instructions will be issued for changes in Work.

1.8. EXAMINATION

- .1 The Contractor is expected to be totally familiar with site conditions and shall assume full responsibility for the cost involved in repairing any damage to the building, site and

services, city property, adjacent buildings, etc., during general construction, regardless of the extent of the damage.

- .2 Inspect existing conditions, including elements or adjacent Work subject to irregularities, damage, movement, including Work during cutting and patching.
- .3 The Contractor shall provide all equipment necessary to make a full and detailed site evaluation. This shall include but not be limited to ladders, flashlights and hand tools.
- .4 The Contractor expressly agrees that conditions above existing suspended acoustic ceilings, but below fixed structure, unless obscured by an additional ceiling above, shall be considered exposed conditions for the purposes of making findings under the provisions of the Contract. There shall be no claims for extra costs for extra Work in these areas.
- .5 After uncovering, inspect conditions affecting performance of the Work.
- .6 Beginning of cutting or patching means acceptance of existing conditions.

1.9. PREPARATION

- .1 Provide supports to assure structural integrity of surroundings; provide devices and methods to protect other portions of project from damage.
- .2 Provide protection from elements for areas which may be exposed by uncovering work; maintain excavations free of water.

1.10. EXISTING SERVICES

- .1 Before commencing work, establish location and extent of service lines in area of Work and notify Consultant of findings.
- .2 Remove abandoned service lines running through within existing and new structures. Cap or seal lines at cut-off points as directed by Consultant.

1.11. LOCATION OF EQUIPMENT AND FIXTURES

- .1 Inform Consultant of conflicting installations, install as directed.
- .2 Locate equipment, fixtures and distribution systems to provide minimum interference and maximum usable space and in accordance with manufacturer's recommendations for safety, access and maintenance.
- .3 Inform Consultant of impending installation and obtain approval for actual location.
- .4 Submit field drawings to indicate relative position of various services and equipment when required by Consultant.

1.12. SURVEY RECORD

- .1 Maintain a complete, accurate log of control and survey work as it progresses.
- .2 On completion of foundations and major site improvements, prepare a certified survey showing dimensions, locations, angles and elevations of Work.
- .3 Record locations of maintained, re-routed and abandoned service lines.

END OF SECTION

1.0 GENERAL

1.1. RELATED SECTIONS

- .1 This section describes requirements applicable to all Sections within Divisions 02 to 49.

1.2. REFERENCES

- .1 Owner's identification of existing survey control points and property limits.

1.3. SUBMITTALS

- .1 Submit name and address of Surveyor to Consultant.
- .2 On request of Consultant, submit documentation to verify accuracy of field engineering work.
- .3 Submit certificate signed by surveyor certifying that elevations and locations of completed Work conforms with Contract Documents.

1.4. QUALIFICATIONS OF SURVEYOR

- .1 Qualified registered land surveyor, licensed to practise in the Place of the Work.

1.5. SURVEY REFERENCE POINTS

- .1 Existing base horizontal and vertical control points are designated on Drawings.
- .2 Locate, confirm and protect control points prior to starting site Work. Preserve permanent reference points during construction.
- .3 Make no changes or relocations without prior written notice to Consultant.
- .4 Report to Consultant when reference point is lost or destroyed, or requires relocation because of necessary changes in grades or locations.
- .5 Require surveyor to replace control points in accordance with original survey control.

1.6. SURVEY REQUIREMENTS

- .1 Establish existing and new permanent bench marks on site, referenced to established bench marks by survey control points.
- .2 Record locations, with horizontal and vertical data in Project Record Documents.
- .3 Establish lines and levels, locate and lay out, by instrumentation.
- .4 Establish pipe invert elevations.
- .5 Stake batter boards
- .6 Establish foundation and floor elevations.
- .7 Establish lines and levels for mechanical and electrical work.

1.7. SUBSURFACE CONDITIONS

- .1 Promptly notify Consultant in writing if discovered surface or subsurface conditions at Place of Work differ materially from those indicated in Contract Documents.
- .2 Advise the Consultant of a reasonable assumption of probable conditions when determined.
- .3 After prompt investigation, should Consultant determine that conditions do differ materially, instructions will be issued for changes in Work.

1.8. EXAMINATION

- .1 The Contractor is expected to be totally familiar with site conditions and shall assume full responsibility for the cost involved in repairing any damage to the building, site and

services, city property, adjacent buildings, etc., during general construction, regardless of the extent of the damage.

- .2 Inspect existing conditions, including elements or adjacent Work subject to irregularities, damage, movement, including Work during cutting and patching.
- .3 The Contractor shall provide all equipment necessary to make a full and detailed site evaluation. This shall include but not be limited to ladders, flashlights and hand tools.
- .4 The Contractor expressly agrees that conditions above existing suspended acoustic ceilings, but below fixed structure, unless obscured by an additional ceiling above, shall be considered exposed conditions for the purposes of making findings under the provisions of the Contract. There shall be no claims for extra costs for extra Work in these areas.
- .5 After uncovering, inspect conditions affecting performance of the Work.
- .6 Beginning of cutting or patching means acceptance of existing conditions.

1.9. PREPARATION

- .1 Provide supports to assure structural integrity of surroundings; provide devices and methods to protect other portions of project from damage.
- .2 Provide protection from elements for areas which may be exposed by uncovering work; maintain excavations free of water.

1.10. EXISTING SERVICES

- .1 Before commencing work, establish location and extent of service lines in area of Work and notify Consultant of findings.
- .2 Remove abandoned service lines running through within existing and new structures. Cap or seal lines at cut-off points as directed by Consultant.

1.11. LOCATION OF EQUIPMENT AND FIXTURES

- .1 Inform Consultant of conflicting installations, install as directed.
- .2 Locate equipment, fixtures and distribution systems to provide minimum interference and maximum usable space and in accordance with manufacturer's recommendations for safety, access and maintenance.
- .3 Inform Consultant of impending installation and obtain approval for actual location.
- .4 Submit field drawings to indicate relative position of various services and equipment when required by Consultant.

1.12. SURVEY RECORD

- .1 Maintain a complete, accurate log of control and survey work as it progresses.
- .2 On completion of foundations and major site improvements, prepare a certified survey showing dimensions, locations, angles and elevations of Work.
- .3 Record locations of maintained, re-routed and abandoned service lines.

END OF SECTION

1.0 GENERAL

1.1. RELATED SECTIONS

- .1 Section 01 32 00 - Construction Progress Documentation: Submittals and scheduling.
- .2 Section 01 61 00 - Product Requirements.
- .3 Section 01 70 00 – Examination and Preparation
- .4 Individual Product Specification Sections:
 - .1 Cutting and patching incidental to work of the section.
 - .2 Advance notification to other sections of openings required in Work of those sections.

1.2. SUBMITTALS

- .1 Submit written request in advance of cutting or alteration which affects:
 - .1 Structural integrity of any element of Project.
 - .2 Integrity of weather exposed or moisture resistant element.
 - .3 Efficiency, maintenance, or safety of any operational element.
 - .4 Visual qualities of sight exposed elements.
 - .5 Work of Owner or separate contractor.
- .2 Include in request:
 - .1 Identification of Project.
 - .2 Location and description of affected Work.
 - .3 Necessity for cutting or alteration.
 - .4 Description of proposed Work and Products to be used.
 - .5 Alternatives to cutting and patching.
 - .6 Effect on work of Owner or separate contractor.
 - .7 Written permission of affected separate contractor.
 - .8 Date and time work will be executed.

1.3. TOLERANCES

- .1 Monitor fabrication and installation tolerance control of Products to produce acceptable Work.
- .2 Do not permit tolerances to accumulate beyond effective or practical limits.
- .3 Comply with manufacturers' tolerances. In case of conflict between manufacturers' tolerances and Contract Documents, request clarification from Consultant before proceeding.
- .4 Adjust Products to appropriate dimensions; position and confirm tolerance acceptability, before permanently securing Products in place.

2.0 PRODUCTS

2.1. MATERIALS

- .1 Primary Products: Those required for original installation.
- .2 Product Substitution: For any proposed change in materials, submit request for substitution described in Section 01 33 00.

3.0 EXECUTION

3.1. EXAMINATION

- .1 Examine existing conditions prior to commencing Work, including elements subject to damage or movement during cutting and patching.
- .2 After uncovering existing Work, assess conditions affecting performance of work.
- .3 Beginning of cutting or patching means acceptance of existing conditions.

3.2. PREPARATION

- .1 Provide temporary supports to ensure structural integrity of the Work. Provide devices and methods to protect other portions of Project from damage.
- .2 Provide protection from elements for areas which may be exposed by uncovering work.
- .3 Maintain excavations free of water.

3.3. CUTTING

- .1 Execute cutting and fitting as needed to complete the Work. Prior to any cutting and or coring of concrete floors the contractor shall confirm the area is free of services or rebar. Notify the Consultant of any interferences.
- .2 Uncover work to install improperly sequenced work.
- .3 Remove and replace defective or non-conforming work.
- .4 Remove samples of installed work for testing for Hazardous materials.
- .5 Provide openings in the Work for penetration of mechanical and electrical work.
- .6 Employ experienced installer to perform cutting for weather exposed and moisture resistant elements, and sight exposed surfaces.
- .7 Cut rigid materials using masonry saw or core drill. Pneumatic tools not allowed without prior approval.
- .8 Do all cutting, patching and making good, to leave a finished condition and to make the several parts of the work come together properly. Coordinate work to keep cutting and patching to a minimum.
- .9 Make cuts with clean, true, smooth edges. Fit unit to tolerance established by test standard practice for applicable work. Make patches invisible in final assembly.
- .10 Cutting shall be done in a manner to keep patching to minimum. Obtain Consultant's approval of method to be used to conceal new mechanical and electrical services before beginning cutting. Chasing of concrete surfaces is not permitted.
- .11 Cutting or coring of any structural concrete is to be reviewed and approved by the Consultant.
- .12 Do not endanger any work by cutting, digging or otherwise altering, and do not cut nor alter any load bearing element without written authorization by Consultant. Provide bracing, shoring and temporary supports as required to keep construction safely supported at all times
- .13 Any cost caused by omission or ill-timed work shall be borne by party responsible therefore.
- .14 Regardless of which Section of work is responsible for any portion of cutting and patching, in each case tradesmen qualified in work being cut and patched shall be employed to ensure it is correctly done.

3.4. PATCHING

- .1 Execute patching to complement adjacent Work.
- .2 Fit Products together to integrate with other Work.
- .3 Execute work by methods to avoid damage to other Work, and which will provide appropriate surfaces to receive patching and finishing.
- .4 Employ original installer to perform patching for weather exposed and moisture resistant elements, and sight-exposed surfaces.
- .5 Restore work with new Products in accordance with requirements of Contract Documents.
- .6 Fit work with adequate support to pipes, sleeves, ducts, conduit, and other penetrations through surfaces.
- .7 At penetrations of fire rated walls, partitions, ceiling, or floor construction, completely seal voids with firestop material.
- .8 Refinish surfaces to match adjacent finish. For continuous surfaces, refinish to nearest intersection or natural break. For an assembly, refinish entire unit.
- .9 Complete and tightly fit all construction to pipes, ducts and conduits which pass through construction to completely prevent the passage of air.
- .10 Patching and making good shall be done by trade specialists in material to be treated, and shall be made undetectable in finished work when viewed from distance of 1.5m under normal lighting.

END OF SECTION

1.0 GENERAL

1.1. RELATED SECTIONS

- .1 Common Work by All Trades
- .2 This section describes requirements applicable to all Sections within Divisions 02 to 49.
- .3 Conduct cleaning and disposal operations to comply with local ordinances and environmental protection legislation.
- .4 Store volatile wastes in covered metal containers, and remove from premises at end of each working day.
- .5 Provide adequate ventilation during use of volatile or noxious substances. Use of building ventilation systems is not permitted for this purpose.

2.0 PRODUCTS

2.1. CLEANING PRODUCTS

- .1 Cleaning Agents and Materials: Low VOC content wherever possible. The Consultant and the Board shall be notified prior to use of any exception.

3.0 EXECUTION

3.1. CLEANING DURING CONSTRUCTION

- .1 Maintain the Work in tidy condition, free from accumulation of waste products and debris, other than that caused by the Owner or other Contractors.
- .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.
- .5 The Contractor shall be responsible for snow removal within the construction area.
- .6 Make arrangements with and obtain permits from authorities having jurisdiction for disposal of waste and debris.
- .7 Wherever possible recycle materials
- .8 Containers:
 - .1 Provide adequate number and sizes of on-site garbage and recycling containers within designated work site as required for collection of waste materials and debris on a daily basis.
 - .2 Provide additional waste containers when extent of work warrants.
 - .3 Provide and use clearly marked, separate bins for recycling.
- .9 Dispose of waste materials and debris at registered waste disposal and recycling facility.
- .10 Remove oily rags, waste and other hazardous substances from premises at close of each day, or more often when required.
- .11 Schedule cleaning operations so that resulting dust, debris and other contaminants will not fall on wet, newly painted surfaces nor contaminate building systems.

3.2. 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 Containers:
 - .1 Provide adequate number and sizes of on-site garbage and recycling containers within designated work site as required for collection of waste materials and debris on a daily basis.
 - .2 Provide additional waste containers when extent of work warrants.
 - .3 Provide and use clearly marked, separate bins for recycling.
- .3 Fires, and burning of rubbish or waste on site is strictly prohibited.
- .4 Burying of rubbish or waste materials on site is strictly prohibited.
- .5 Disposal of waste or volatile materials such as mineral spirits, oil, gasoline or paint thinner into ground, waterways, or sewer systems is prohibited.
- .6 Empty waste containers on a regular basis to prevent contamination of site and adjacent properties by wind-blown dust or debris

3.3. PREPARATION FOR FINAL CLEANING

- .1 Prior to final cleaning the General Contractor shall:
 - .1 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,
 - .2 replace all filters installed on any equipment in operation in the area of work,
 - .3 remove all paint spots or overspray from all affected surfaces, and

3.4. FINAL CLEANING PRIOR TO ACCEPTANCE: INTERIOR

- .1 Prior to applying for Substantial Performance of the Work, or, prior to Owner occupancy of the building or portion of the building affected by the Work, whichever comes first, conduct full and complete final cleaning operations for the areas to be occupied.
- .2 Final cleaning operations shall be performed by an experienced professional cleaning company, possessing equipment and personnel sufficient to perform full building cleaning operations. Contractors "broom cleaning" is not acceptable as a "Final Clean". The cleaning contractor shall:
 - .1 clean interiors of all millwork and surfaces of any furniture and equipment present,
 - .2 use only cleaning materials recommended by the manufacturer of the surface to be cleaned,
 - .3 remove all stains, spots, scuff marks, dirt, dust, remaining labels, adhesives or other surface imperfections,
 - .4 clean and polish all glass and mirrors and remove remaining manufacturer's and safety "X" labels,
 - .5 clean and polish all finished metal surfaces such as enamelled or stainless steel, chrome, aluminum, brass, and bronze,
 - .6 clean and polish all vitreous surfaces such as plumbing fixtures, ceramic tile, porcelain enamel, or other such materials,
 - .7 clean all ceramic tile surfaces in accordance with the manufacturer's instructions,
 - .8 vacuum, clean and dust behind grilles, louvres and screens,

- .9 steam clean all unprotected carpets immediately prior occupancy by Owner, and
- .10 clean all equipment and fixtures to a sanitary condition.
- .3 For any areas to be occupied after the owner's initial occupancy, provide full cleaning operations as outlined above prior to turning over to owner,
- .4 The Board's supplies and equipment must not be used for any cleaning operations including, but not limited to: garbage cans, mops, brooms, rags, ladders, chemicals etc.

3.5. FINAL CLEANING PRIOR TO ACCEPTANCE: EXTERIOR

- .1 For areas effected by construction final exterior cleaning operations shall be performed by the General Contractor or competent sub-contractor. Contractor's "broom cleaning" only is not acceptable.
- .2 Final exterior cleaning shall include:
 - .1 broom clean and wash exterior walks, steps and surfaces; rake clean other surfaces of grounds,
 - .2 remove dirt and other disfiguration from exterior surfaces,
 - .3 sweep and wash clean paved areas,
 - .4 replace filters of mechanical equipment for all equipment that was in use during construction,
 - .5 clean all roofs, gutters, downspouts, areaways, drywells, and drainage systems,
 - .6 remove debris and surplus materials from crawl areas and other accessible concealed spaces.
 - .7 remove overspray

END OF SECTION

1.0 GENERAL

1.1. RELATED SECTIONS

- .1 Section 01 78 10 – Appendix 1 and 2 – Warranty Card

1.2. TAKE-OVER PROCEDURES

- .1 Take over procedures will be in strict accordance with the requirements as set out in this Section.

1.3. SUBSTANTIAL PERFORMANCE

- .1 Prior to requesting a Substantial Performance deficiency inspection submit 2 hard copies, 1 digital copy of the Operating and Maintenance Manuals for Consultants approval.
- .2 Application for Substantial Performance must include.
 - .1 One (1) electronic copy of inspection and acceptance certificates required from regulatory agencies, including but not limited to.
 - .1 Certificates of Approval of the Work by the local Building Department.
 - .2 Electrical Inspection Certificate of Inspection.
 - .3 Fire Alarm Verification Certificate.
- .3 Advise Consultant in writing, when project has been substantially completed. If Consultant agrees this stage has been reached, the Consultant shall prepare a complete list of deficiencies and submit copies of this list to Contractor and the Board.

1.4. COMMENCEMENT OF LIEN PERIODS

- .1 The date of publication of the Certificate of Substantial Performance of the Work, provided to the contractor by the Consultant, shall be the date for commencement of the lien period.

1.5. TOTAL PERFORMANCE

- .1 Prior to requesting a final inspection submit written certificate that the following have been performed:
 - .1 Work has been completed and inspected for compliance with Contract Documents and is ready for final inspection
 - .2 Defects have been corrected and deficiencies have been completed.
 - .3 Equipment and systems have been tested and are fully operational. Submit two copies of the balancing reports
 - .4 Certificates required by the contractor have been submitted.
 - .5 Operation of systems have been demonstrated to Owner's personnel.
 - .6 Submit Record drawings.
 - .7 Submit maintenance materials.
 - .8 Provide certified site survey
- .2 When items noted above are completed, request final inspection of Work by consultant, and building inspector. If Work is deemed incomplete by Consultant, complete outstanding items and request re-inspection.

1.6. PAYMENT OF SUBSTANTIAL PERFORMANCE HOLDBACK

- .1 Prior to the release of lien holdback provide one copy of the following by the Contractor and each subcontractor:
 - .1 Statutory Declaration or Declaration of Last supply

- .2 Workplace Safety and Insurance Board "Certificate of Clearance".
- .2 The Contractor shall submit an application for payment of the holdback amount.
- .3 After the receipt of an application for payment which will include a Statutory Declaration and WSIB Clearance from the, the Consultant will issue a certificate for payment of the holdback amount.

1.7. FINAL PAYMENT

- .1 When the Contractor considers final deficiencies and defects have been corrected and it appears requirements of Contract have been completed, make application for final payment.
- .2 When the Consultant finds the Contractor's application for final payment valid, the Consultant will issue a final certificate of payment
- .3 The Board reserves the right to charge the Contractor for school access card(s) that have not been returned.
- .4 The cost to reprogram or replace the card(s) access system is estimated at \$50.00 (fifty dollars) for each card issued, \$30.00 (thirty dollars) for each keybox key, plus \$35.00 (thirty five dollars) administration fee.

1.8. CLOSEOUT SUBMITTALS

- .1 Prepare instructions and data using personnel experienced in maintenance and operation of described products and submit to Consultant for review.
- .2 Copy will be returned to contractor with Consultant's comments.
- .3 Revise content of documents as required prior to final submittal.
- .4 Two (2) weeks prior to Substantial Performance of the Work, submit to the Consultant, the final copies of operating and maintenance manuals.
- .5 Ensure spare parts, maintenance materials and special tools provided are new, undamaged or defective, and of same quality and manufacture as products provided in Work.
- .6 If requested, furnish evidence as to type, source and quality of products provided.
- .7 Defective products will be rejected, regardless of previous inspections. Replace products at own expense.
- .8 Pay costs of transportation.

1.9. OPERATION AND MAINTENANCE MANUAL FORMAT

- .1 Provide two copies of operating and maintenance data, prepared on 215 X 280mm sheets in printed or typewritten form, contained in 3-ring binders with soft vinyl covers for materials and equipment which require special maintenance or operating procedures.
- .2 When multiple binders are used, correlate data into related consistent groupings. Identify contents of each binder at the front of each volume.
- .3 Cover: Identify each binder with type or printed title 'Project Record Documents'; list title of project and identify subject matter of contents.
- .4 Arrange content by the divisions of the specifications under Section numbers and sequence of Table of Contents.
- .5 Provide tabbed fly leaf for each separate product and system, with typed description of product and major component parts of equipment.
- .6 Include the following in each manual:

- .1 Complete list of subcontractors and suppliers, their addresses and telephone numbers. Provide 24 hour emergency telephone number for such subcontractors as Plumbing, Electrical, Sprinklers, Fire System, Heating, etc.
- .2 Specified warranties for contractor, each subcontractor and supplier.
- .3 Boards Warranty Card
- .4 Copy of finish hardware list, complete with all amendments and revisions and lock manufacturer's descriptive and service literature.
- .5 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.
- .6 Maintenance instructions for finished surfaces.
- .7 Brochures, cuts of equipment and fixtures.
- .8 Operating and maintenance instructions for equipment.
- .9 Submit copies of letters from manufacturers of equipment and systems indicating their technical representatives have inspected and tested systems and are satisfied with methods of installation, connection and operations. These letters shall state names of persons present at testing, methods used and list of functions performed.
- .10 Submit one complete set of reviewed shop drawings of architectural, structural, mechanical and electrical items, folded to 215 x 280mm size, contained in heavy duty manila envelopes, numbered and labelled. Follow specification format with no more than one Section per envelope, hard copy and PDF.
- .11 Relevant certificates issued by authorities having jurisdiction
- .12 Computer disc or flash drive with all the above documentation in PDF format

1.10. RECORDING ACTUAL SITE CONDITIONS

- .1 Record information on set of black line opaque drawings, and within the Project Manual.
- .2 Annotate with coloured felt tip marking pens, maintaining separate colours for each major system, for recording changed information.
- .3 Record information concurrently with construction progress. Do not conceal Work of the Project until required information is accurately 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.
- .5 Specifications: legibly mark each item to record actual construction, including:
 - .1 Manufacturer, trade name, and catalogue number of each product actually installed, particularly optional items and substitute items.
 - .2 Changes made by Addenda and change orders.
- .6 Other Documents: Maintain warranties, test reports and samples required by individual specifications sections.

1.11. RECORD (AS-BUILT) DOCUMENTS AND SAMPLES

- .1 Store AS-BUILT documents and samples in field office apart from documents used for construction. Provide files, racks, and secure storage.
- .2 Label AS-BUILT documents and file in accordance with section number listings in List of Contents of the Project Manual. Label each document AS-BUILT DOCUMENTS in neat, large, printed letters.
- .3 Maintain AS-BUILT documents in clean, dry and legible condition. Do not use as-built documents for construction purposes.
- .4 Keep as-built documents and samples available for inspection by Consultant.

1.12. RECORD DRAWINGS

- .1 Prior to Substantial Performance of the Work, update the marked up information from the AS-BUILT documents to a master set of drawing.
- .2 Submit one set of completed AS-BUILT documents to the Consultant for review.
- .3 Documents will be returned to contractor with Consultant's comments.
- .4 Revise content of documents as required prior to final submittal.
- .5 After the review is completed resubmit to the Consultant for Consultant to produce electronic record drawings for the owner to use.

1.13. SPARE PARTS

- .1 Provide spare parts, in quantities specified in individual specification sections.
- .2 Provide items of same manufacture and quality as items in Work.
- .3 Receive and catalogue all items. Submit inventory listing to Consultant. Include approved listings in Maintenance Manual.
- .4 Obtain receipt for delivered products and submit prior to final payment.

1.14. REPLACEMENT (MAINTENANCE) MATERIALS

- .1 Deliver to site, unload and store where directed, replacement (maintenance) materials as required elsewhere in these Specifications. Obtain signed receipt from Owner's Representative for delivered materials and include copy of receipt in Operation and Maintenance manuals.
- .2 Package materials so they are protected from damage and loss of essential properties.
- .3 Label packaged materials for proper identification of contents.

1.15. SPECIAL TOOLS

- .1 Provide special tools, in quantities specified in individual specification section.
- .2 Provide items with tags identifying their associated function and equipment.
- .3 Receive and catalogue all items. Submit inventory listing to Consultant. Include approved listings in Maintenance Manual

1.16. FINAL SITE SURVEY

- .1 Submit final site survey certificate in accordance with Section 01 70 00, certifying that elevations and locations of completed Work are in conformance Contract Documents.

1.17. 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 Except for items put into use with Owner's permission, leave date of beginning of time of warranty until the Date of Substantial Performance is determined. The date of Substantial Performance of the Work shall be the date for commencement of the warranty period.
- .4 Verify that documents are in proper form, contain full information, and are notarized.
- .5 Co-execute submittals when required.
- .6 Retain warranties and bonds until time specified for submittals.

END OF SECTION

1.0 GENERAL

1.1. SECTION INCLUDES

- .1 Procedures for demonstration and instruction of Products, equipment and systems to Owner's personnel.
- .2 Seminars and demonstrations.

1.2. RELATED SECTIONS

- .1 This section describes requirements applicable to all Sections within Divisions 02 to 49.

1.3. DESCRIPTION

- .1 At Substantial Performance, at a time acceptable to Owner and Consultant, but not before operations and maintenance manual have been reviewed and accepted by the consultant; contractor shall give a complete demonstration in the presence of consultant; Sub-consultants, Owner and Owner's personnel of operation and maintenance of systems and equipment once they are 100% complete.
- .2 Owner will provide list of personnel to receive instructions and will coordinate their attendance at agreed-upon times.

1.4. COMPONENT DEMONSTRATION

- .1 Manufacturer to provide authorized representative to demonstrate operation of equipment and systems.
- .2 Instruct Owner's personnel, and provide written report that demonstration and instructions have been completed.

1.5. SUBMITTALS

- .1 Submit schedule of time and date for demonstration of each item of equipment and each system one (1) week prior to designated dates, for Consultant's approval.
- .2 Submit reports within forty eight (48) after completion of demonstration, that demonstration and instructions have been satisfactorily completed.
- .3 Give time and date of each demonstration, with list of persons present.

1.6. CONDITIONS FOR DEMONSTRATIONS

- .1 Equipment has been inspected and put into operation in accordance with manufacturer's instructions and contract requirements.
- .2 Testing, adjusting, and balancing have been performed in accordance with manufacturer's instructions and contract requirements, and equipment and systems are fully operational.
- .3 Provide information packages as required for use in demonstrations and instructions.

2.0 PRODUCTS

2.1. NOT USED

- .1 Not used.

3.0 EXECUTION

3.1. PREPARATION

- .1 Verify that suitable conditions for demonstration and instructions are available.
- .2 Verify that designated personnel are present.
- .3 Prepare agendas and outlines.
- .4 Establish seminar organization.
- .5 Explain component design and operational philosophy and strategy.
- .6 Develop equipment presentations.
- .7 Present system demonstrations.
- .8 Accept and respond to seminar and demonstration questions with appropriate answers.

3.2. PREPARATION OF AGENDAS AND OUTLINES

- .1 Prepare agendas and outlines including the following:
 - .1 Equipment and systems to be included in seminar presentations.
 - .2 Name of companies and representatives presenting at seminars.
 - .3 Outline of each seminar's content.
 - .4 Time and date allocated to each system and item of equipment.
 - .5 Provide separate agenda for each system.

3.3. SEMINAR ORGANIZATION

- .1 Coordinate content and presentations for seminars.
- .2 Coordinate individual presentations and ensure representatives scheduled to present at seminars are in attendance.
- .3 Arrange for presentation leaders familiar with the design, operation, maintenance and troubleshooting of the equipment and systems. Where a single person is not familiar with all aspects of the equipment or system, arrange for specialists familiar with each aspect.
- .4 Coordinate proposed dates for seminars with Owner and select mutually agreeable dates.

3.4. EXPLANATION OF DESIGN STRATEGY

- .1 Explain design philosophy of each system. Include following information:
 - .1 An overview of how system is intended to operate.
 - .2 Description of design parameters, constraints and operational requirements.
 - .3 Description of system operation strategies.
 - .4 Information to help in identifying and troubleshooting system problems.

3.5. DEMONSTRATION AND INSTRUCTIONS

- .1 Demonstrate start-up, operation, control, adjustment, trouble-shooting, servicing, and maintenance of each item of equipment.
- .2 Instruct personnel in all phases of operation and maintenance using operation and maintenance manuals as the basis of instruction.
- .3 Instruct personnel on control and maintenance of sensory equipment and operational equipment associated with maintaining energy efficiency and longevity of service.
- .4 Review contents of manual in detail to explain all aspects of operation and maintenance. Prepare and insert additional data in operations and maintenance manuals when the need for additional data becomes apparent during instructions.

END OF SECTION

1.0 GENERAL

1.1 SECTION INCLUDES

- .1 Alteration project procedures.
- .2 Removal of designated building equipment and fixtures.
- .3 Removal of designated construction.
- .4 Disposal of materials, Storage of removed materials.
- .5 Identification of utilities.
- .6 Refer to items scheduled at end of section, as indicated.

1.2 RELATED SECTIONS

- .1 Section 02 41 16 - Structure Demolition.
- .2 Section 01 74 00 – Cleaning and Waste Management

1.3 ALTERATION PROJECT PROCEDURES

- .1 Materials: As specified in Product sections; match existing Products and work for patching and extending work.
- .2 Employ skilled and experienced personnel to perform alteration work.
- .3 Provide materials, equipment and all shoring required to perform work of this section.
- .4 Close openings in exterior surfaces to protect existing work from weather and extremes of temperature and humidity.
- .5 Remove, cut, and patch Work in a manner to minimize damage and to provide means of restoring Products and finishes to specified original condition.
- .6 Refinish existing visible surfaces to remain in renovated rooms and spaces, to renewed specified condition for each material, with a neat transition to adjacent finishes.
- .7 Where new Work abuts or aligns with existing, provide a smooth and even transition. Patch Work to match existing adjacent Work in texture and appearance.
- .8 When finished surfaces are cut so that a smooth transition with new Work is not possible, terminate existing surface along a straight line at a natural line of division and submit recommendation to Consultant for review.
- .9 Where a change of plane of 6 mm or 1/4 inch or more occurs, request instructions from Consultant, submit recommendation for providing a smooth transition; to Consultant for review.
- .10 Patch or replace portions of existing surfaces which are damaged, lifted, discoloured, or showing other imperfections.
- .11 Finish surfaces as specified in individual Product sections.

1.4 ADMINISTRATIVE REQUIREMENTS

- .1 Scheduling: Schedule work to requirements of Section 01 31 00.
 - .1 Schedule Work to coincide with site excavation work, coincide with new construction, precede new construction, precede site excavation work.
 - .2 Describe demolition removal procedures and schedule.
- .2 Perform dusty, noisy, malodorous work:
 - .1 Between the hours of 7 A.M. and 4.PM
 - .2 On the following days: Monday to Friday.

1.5 SUBMITTALS FOR REVIEW

- .1 Section 01 33 00: Submission procedures.
- .2 Shop Drawings: Indicate removal sequence and location of salvageable items, demolition; location and construction of temporary work.
- .3 As required by authorities having jurisdiction and by other sections of this specification, submit for approval, drawings, diagrams, details and supporting data clearly showing sequence of demolition and removal work of building and shoring designed by a registered professional structural engineer licensed to practice in Ontario.

1.6 SUBMITTALS FOR INFORMATION

- .1 Section 01 33 00: Submission procedures.
- .2 Sustainable Design: **NOT APPLICABLE**
 - .1 Section 01 35 18: LEED documentation procedures. **If applicable**
 - .2 Provide required LEED documentation for Product regional materials, recycled content. **If applicable**
 - .3 Manufacturer's Certificate: Certify that Products meet or exceed, specified requirements.

1.7 CLOSEOUT SUBMITTALS

- .1 Section 01 78 10: Submission procedures.
- .2 Record Documentation: Accurately record actual locations of capped utilities, subsurface obstructions, and other significant details.
- .3 Sustainable Design Closeout Documentation: If applicable

1.8 REGULATORY REQUIREMENTS

- .1 Conform to applicable code for demolition work, dust control, products requiring electrical disconnection, reconnection.
- .2 Obtain required permits from authorities.
- .3 Do not close or obstruct egress width to any building or site exit.

- .4 Do not disable or disrupt building fire or life safety systems without three (3) days prior written notice to Owner.
- .5 Conform to applicable regulatory procedures when discovering hazardous or contaminated materials.

1.9 PROJECT CONDITIONS

- .1 Conduct demolition to minimize interference with adjacent and occupied building areas.
- .2 Cease operations immediately if structure appears to be in danger and notify Consultant. Do not resume operations until directed.
- .3 Visit the site and the existing building so as to fully understand all existing conditions and extent of work required. No increase in cost or extension of performance time will be considered for failure to know conditions.

1.10 PROTECTION

- .1 Prevent movement or settlement of adjacent work. Provide and place bracing or shoring and be responsible for safety and support of such work. Be liable for any such movement or settlement, and any damage or injury caused.
- .2 Cease operations and notify Project Manager if safety of any adjacent work or structure appears to be endangered. Take all precautions to support the structure. Do not resume operations until reviewed with Project manager.
- .3 Cease operations and notify the Minister immediately for special protective and disposal instructions when asbestos materials or other hazardous materials [, other than those identified,] are uncovered during the work of this project.
- .4 Prevailing weather conditions and weather forecasts shall be considered. Demolition work shall not proceed when weather conditions constitute a hazard to the workers and site.
- .5 Prevent debris from blocking surface drainage inlets and mechanical and electrical systems which remain in operation.
- .6 Temporarily suspended work that is without continuous supervision, shall be closed to prevent entrance of unauthorized persons.

2.0 EXECUTION

2.1 PREPARATION

- .1 Ensure that affected building areas are unoccupied and discontinued in use prior to start of demolition work.
- .2 Verify that existing services in areas affected by demolition work are disconnected, capped or removed, prior to start of work.
- .3 Provide, erect, and maintain temporary partitions, insulated partitions, barriers at locations indicated.
- .4 Erect and maintain weatherproof closures for exterior openings.
- .5 Erect and maintain temporary partitions to prevent spread of dust, odours, and noise to permit continued Owner occupancy.
- .6 Protect existing materials and structure which are not to be demolished.

- .7 Prevent movement of structure; provide bracing and shoring.
- .8 Notify affected utility companies before starting work and comply with their requirements.
- .9 Disconnect all electrical and telephone service lines in the areas to be demolished in accordance with rules and regulations of authorities having jurisdiction. Post warning signs on all electrical lines and equipment that must remain energized to serve other areas during period of demolition.
- .10 Disconnect and cap mechanical services in accordance with requirements of local authority having jurisdiction.
 - .1 Natural gas supply lines to be removed by qualified tradesman in accordance with gas company instructions.
 - .2 Remove sewer and water lines and cap to prevent leakage.
 - .3 Remove and cap other underground services.
 - .4 In each case notify the affected utility company in advance and obtain approval where required, before commencing with the work on main services.
- .11 Mark location and termination of utilities.
- .12 Do not disrupt active or energized utilities designated to remain undisturbed.
- .13 Provide appropriate temporary signage including signage for exit or building egress.

2.2 DEMOLITION

- .1 Carry out demolition work in accordance with CSA S350, unless otherwise specified.
- .2 Disconnect remove, cap, identify, designated utilities within demolition areas.
- .3 Demolish in an orderly and careful manner. Protect existing supporting structural members.
- .4 Remove from site all materials indicated to be demolished except where specifically noted otherwise. Do not burn or bury materials on site.
- .5 Remove materials as Work progresses. Upon completion of Work, leave areas in clean condition.
- .6 Carry out demolition in a manner to minimize inconvenience to adjacent occupied space.
- .7 Demolish work in a safe and systematic manner, from top to bottom.
- .8 Sprinkle exterior debris with water to prevent dust. Do not cause flooding, contaminated runoff or icing. Do not allow waste material, rubbish, and windblown debris to reach and contaminate adjacent properties.
- .9 Lower waste materials in a controlled manner; do not drop or throw materials from heights. Use chutes, conveyors, or hoisting equipment to lower materials.
- .10 Demolish masonry and concrete elements in small sections. Carefully remove and lower structural framing and other heavy and large objects.
- .11 At end of each work period, leave work in a safe condition, so that no part is in danger of toppling or falling.
- .12 Remove temporary Work.

2.3 SCHEDULES

- .1 Remove the equipment and materials for the Owner's retention. Refer to demolition drawings
- .2 Owner will remove and keep material and equipment noted on demolition drawings
- .3 Protect the materials and equipment remaining: Refer to demolition drawings

2.4 CLEAN UP

- .1 For clean up during demolition and for final cleaning , comply with requirements of Section 01 74 00.

END OF SECTION



Section 02 82 00.01

**TYPE I ASBESTOS ABATEMENT SPECIFICATION
TDSB – DOWNSVIEW SS
7 HAWKSDALE ROAD
TORONTO, ONTARIO**

Issued:
March 2025

Prepared For:
Reem Mokhoul
Toronto District School Board
15 Oakburn Cres,
Toronto, Ontario

Prepared By:
T. Harris Environmental Management Inc.
93 Skyway Avenue, Suite 101
Toronto, Ontario
M9W 6N6

THEM Project Number: T26-52809



CONTENTS

1.0	<u>GENERAL</u>	1
1.1	General Requirements	1
1.2	Related Work	1
1.2	Description of Work	1
1.3	Definitions	1
1.4	Regulations	1
1.5	Quality Assurance	2
1.6	Submittals Before Commencing Work	2
1.7	Worker Protection	3
2.0	PRODUCTS	3
2.1	Materials	3
3.0	EXECUTION	4
3.1	Preparation	4
3.2	Removal	4
3.3	Waste Transport and Disposal	4

1.0 GENERAL

1.1 General Requirements

- 1.1.1 Conform to tender documents and all related specifications documents as applicable.

1.2 Related Work

- 1.1.1 This abatement work may be conducted in conjunction with other asbestos abatement and/or repair activities being conducted within the specified areas, including but not limited to the following: Type 2 abatement operations, and Type 3 Full Enclosure asbestos abatement operations.

1.2 Description of Work

- 1.2.1 Remove asbestos-containing vinyl floor tiles, as necessary, using non-powered hand tools.
- 1.2.2 Maintain electrical and mechanical services passing through asbestos work area.
- 1.2.3 All work may be subject to inspection and/or air monitoring inside and outside asbestos work area by Client's Consultant. Any contamination of surrounding areas, indicated by visual inspection or air monitoring, shall necessitate complete clean-up of affected areas.

1.3 Definitions

- 1.3.1 **HEPA Filter:** High Efficiency Particulate Aerosol filter at least 99.97 percent efficient in collecting 0.3 micrometer aerosol.
- 1.3.2 **Non-Friable Material:** Material that when dry can not be crumbled, pulverized or powdered by hand pressure. Includes, but not limited to, following asbestos containing products: vinyl asbestos floor tiles, resilient sheet flooring, acoustic ceiling and wall tiles, gaskets, seals, packings, friction products and asbestos cement panels, shingles and piping.
- 1.3.3 **Polyethylene Sheeting:** Polyethylene sheeting of 0.15 mm (6 mil) minimum thickness with tape seals along edges, around penetrating objects, over cuts and tears, and elsewhere as required to provide continuous membrane protection.
- 1.3.4 **Authorized Visitor(s):** Client's Consultant or person(s) representing regulatory agencies, and person(s) authorized by them.
- 1.3.5 **Asbestos Work Area(s):** Area(s) where work takes place which will, or may, disturb asbestos-containing material.

1.4 Regulations

- 1.4.1 Comply with Regulation respecting Asbestos on Construction Projects and in Buildings and Repair Operations made under The Occupational Health and Safety Act, Ontario Regulation 278/05 and local requirements pertaining to asbestos, provided that in case of conflict with these Specifications. Most stringent requirements shall apply.
- 1.4.2 Handle and dispose of contaminated waste as required under Ontario Regulation 347/90 as amended made under The Environmental Protection Act.

-
- 1.4.3 Not later than ten days before commencing asbestos work on this project, notify in writing Ontario Ministry of Labour, Construction Health and Safety Branch located nearest to the area the abatement is being conducted. The information provided to the Ontario Ministry of Labour must comply with the requirements outlined in Section 11, subsection 3 of Ontario Regulation 278/05. Orally notify them before commencing work.
 - 1.4.4 Notify sanitary landfill site in accordance with requirements of Ontario Regulation 347/90 as amended.
 - 1.4.5 Contractor shall ensure that:
 - 1.4.5.1 Measures and procedures prescribed under the Occupational Health & Safety Act and regulations are carried out.
 - 1.4.5.2 Every employee and every worker on project complies with applicable act and regulations.
 - 1.4.5.3 Health and safety of workers and public is protected
 - 1.4.5.4 Internal policies and procedures of the clients are complied with.
 - 1.4.5.5 All material handling, and associated equipment conform to and are operated in accordance with "Workplace Hazardous Materials Information System" (WHMIS).
 - 1.4.5.6 Advise client whenever work is expected to be potentially hazardous to employees and/or public.
 - 1.4.5.7 Contractor may be requested to provide information on their health and safety record.

1.5 Quality Assurance

- 1.5.1 Ensure work proceeds to schedule, and meets all requirements of this Section. Perform work so airborne asbestos, asbestos waste, or water runoff do not contaminate areas outside asbestos work enclosure.
- 1.5.2 Pay cost to Client of inspection and air monitoring performed as result of failure to perform work satisfactorily regarding quality, safety, or schedule.
- 1.5.3 Use only skilled and qualified workers for all trades required for this work.

1.6 Submittals Before Commencing Work

- 1.6.1 Before commencing work:
 - 1.6.1.1 Obtain and submit all necessary permits for transporting and disposal of asbestos waste.
 - 1.6.1.2 Submit names of supervisory personnel who will be responsible for asbestos work area(s). One supervisor must remain on Site at all times asbestos removal or clean-up is occurring. Submit proof that supervisory personnel have attended training course on asbestos control (2 day minimum duration) and have performed supervisory function on at least 2 other asbestos control projects.
 - 1.6.1.3 Submit list of existing damage for acceptance.
 - 1.6.1.4 Laws of province of Ontario shall govern this work. Contractor shall observe all such laws and shall obtain and/or pay all permits, notices, fees, taxes, duties as may be required. Likewise, it is responsibility of contractor to comply with Workers Compensation and Occupational Health and Safety

Act.

- 1.6.1.5 Before commencing any work, Contractor shall submit, in writing, confirmation of good standing with Workplace Safety and Insurance Board.

1.7 Worker Protection

- 1.7.1 Respirators: An air purifying half mask respirator with N-100, R-100 or P-100 particulate filter should be worn by personnel conducting Type 1 asbestos abatement activities. Maintenance and care for respirators should be conducted as per Canadian Standards Association Z94.4-02 Selection, Use, and Care of Respirators Guideline. The contractor may be required to provide a copy of their respiratory protection program
- 1.7.2 Protective Clothing: Protective clothing (full body coveralls with integral hoods) should be worn for Type 1 asbestos abatement activities. Once coveralls are worn in asbestos work area, dispose of as asbestos contaminated waste. Workers and visitors shall wear other protective apparel required by Ministry of Labour construction regulations. Coveralls can be reused, to maximum of 8 hours wear, if coveralls remain inside work area.
- 1.7.3 Provide, and insist on using, facilities for washing of hands and face by every worker when leaving asbestos work area.
- 1.7.4 Prohibit smoking, eating and drinking in asbestos work area.

2.0 PRODUCTS

2.1 Materials

- 2.1.1 Asbestos Waste Receptors: 2 separate containers of which 1 shall consist of 0.15 mm (6 mil) minimum thickness sealable polyethylene bag. Other container may be 0.15 mm (6 mil) minimum thickness polyethylene bag or rigid sealable container such as cardboard or metal or fibre drum or wood box. Other container shall be adequate to prevent perforating rips or tears in first container during filling, transport or disposal. Containers must be acceptable to disposal site selected and Ministry of Environment. Containers shall be labelled in accordance with Ministry of Environment regulations.
- 2.1.2 HEPA Vacuum: Vacuum with all necessary fittings, tools and attachments. Air must pass HEPA filter before discharge.
- 2.1.3 Sprayer: Garden-type portable manual sprayer, low velocity, capable of producing mist or fine spray.
- 2.1.4 Polyethylene Sheeting: 0.15 mm (6 mil) minimum thickness unless otherwise specified; in sheet size to minimize joints.
- 2.1.5 Tape: Tape suitable for sealing polyethylene to surface encountered under wet conditions using amended water and under dry conditions.
- 2.1.6 Amended Water: Water with non-ionic water wetting agent added.

3.0 EXECUTION

3.1 Preparation

- 3.1.1 Before disturbing non-friable asbestos materials except those used as flooring, cover floor and furnishings below work with polyethylene sheeting.
- 3.1.2 Before beginning work, visible dust shall be removed with a damp cloth or a vacuum equipped with a HEPA filter from any surface in the work area, including the thing to be worked on, if the dust on that surface is likely to be disturbed.

3.2 Removal

- 3.2.1.1 Where possible wet material to be disturbed. All materials being removed can only be done so using non-powered hand held tools.
- 3.2.1.2 Undo fasteners (where applicable) if necessary to remove material. Whenever possible remove materials intact. Break only if unavoidable. If broken, wet freshly exposed edges.
- 3.2.1.3 Wet material and use hand scraping to remove material adhering to substrate.
- 3.2.1.4 Immediately place removed material in asbestos waste receptor, except gypsum board debris is not subject to Ministry of Environment waste packaging and disposal requirements. Clean surrounding surfaces and asbestos work area frequently with HEPA vacuum or with wet methods.
- 3.2.1.5 Dispose of drop sheets as asbestos waste. Do not reuse.

3.3 Waste Transport and Disposal

- 3.3.1 Conform to requirements of Regulation 347/90 as amended under Environmental Protection Act for Waste Management, transporting and disposal of hazardous waste.
- 3.3.2 Check with dump operator to determine type of waste containers acceptable.
- 3.3.3 Ensure shipment of containers to dump is taken by waste hauler licensed to transport asbestos waste.
- 3.3.4 Each load requires completion of bill of lading showing type and weight of hazardous waste being transported.
- 3.3.5 Co-operate with Ministry of Environment inspectors and immediately carry out instructions for remedial work at dump to maintain environment, at no additional cost to Client.
- 3.3.6 Ensure dump operator is fully aware of hazardous material being dumped.
- 3.3.7 Ensure that containers used for dumping are locked and covered at all times.

End of Section

PART 1 - GENERAL

- | | | | |
|-----|--|----|---|
| 1.1 | <u>General Requirements</u> | .1 | Comply with requirements of Division 1. |
| 1.2 | <u>Work Supplied to Other Trades</u> | .1 | Supply following items for installation under other Sections of work: Anchor bolts, bearing plates, sleeves and other inserts to be built into concrete and masonry elements and required for anchorage and support the work of this section. |
| | | .2 | Supply other Sections with instructions, and if required, templates, necessary for accurate setting of inserts and components. |
| 1.3 | <u>Source Quality Control</u> | .1 | Lumber identification: by grade stamp of an agency certified by Canadian Lumber Standards Accreditation Board. |
| | | .2 | Plywood identification: by grade mark in accordance with applicable CSA standards. |
| 1.4 | <u>Product Delivery & Storage</u> | .1 | Store material on site on skids off the ground and covered for protection from rain. |
| | | .2 | Take adequate measures to prevent moisture gain of kiln dried materials. |

PART 2 - PRODUCTS

- | 2.1 | <u>Lumber Material</u> | .1 | Lumber: unless specified otherwise, softwood, S4S, moisture content 19% or less in accordance with following standards: | | | | | | | | | | | | | | | | | | | | | |
|-------------|-------------------------------|--------------|--|------------|----------------|--------------|----------|--------|---|-------|--------|---|--------|--------|---|-------|--------|---|-------|-------------|---|-------------|-------------|---|
| | | .1 | CAN 3-086-M84 | | | | | | | | | | | | | | | | | | | | | |
| | | .2 | CSA 0141-1970 | | | | | | | | | | | | | | | | | | | | | |
| | | .3 | NLGA Standard Grading Rules for Canadian Lumber, 1980 edition revised according to Supplement No. 1, 1981. | | | | | | | | | | | | | | | | | | | | | |
| | | .2 | Furring, blocking, railing strips, grounds, rough bucks, curbs. | | | | | | | | | | | | | | | | | | | | | |
| | | | <table border="0"> <thead> <tr> <th><u>USE</u></th> <th><u>SPECIES</u></th> <th><u>GRADE</u></th> </tr> </thead> <tbody> <tr> <td>Blocking</td> <td>Spruce</td> <td>2</td> </tr> <tr> <td>Studs</td> <td>Spruce</td> <td>1</td> </tr> <tr> <td>Plates</td> <td>Spruce</td> <td>1</td> </tr> <tr> <td>Other</td> <td>Spruce</td> <td>1</td> </tr> <tr> <td>Cants</td> <td>Douglas Fir</td> <td>2</td> </tr> <tr> <td>Wood Fascia</td> <td>Douglas Fir</td> <td>1</td> </tr> </tbody> </table> | <u>USE</u> | <u>SPECIES</u> | <u>GRADE</u> | Blocking | Spruce | 2 | Studs | Spruce | 1 | Plates | Spruce | 1 | Other | Spruce | 1 | Cants | Douglas Fir | 2 | Wood Fascia | Douglas Fir | 1 |
| <u>USE</u> | <u>SPECIES</u> | <u>GRADE</u> | | | | | | | | | | | | | | | | | | | | | | |
| Blocking | Spruce | 2 | | | | | | | | | | | | | | | | | | | | | | |
| Studs | Spruce | 1 | | | | | | | | | | | | | | | | | | | | | | |
| Plates | Spruce | 1 | | | | | | | | | | | | | | | | | | | | | | |
| Other | Spruce | 1 | | | | | | | | | | | | | | | | | | | | | | |
| Cants | Douglas Fir | 2 | | | | | | | | | | | | | | | | | | | | | | |
| Wood Fascia | Douglas Fir | 1 | | | | | | | | | | | | | | | | | | | | | | |
| 2.2 | <u>Plywood</u> | .1 | Douglas Fir to CSA 0121-M1978 Unsanded Sheathing Grade. | | | | | | | | | | | | | | | | | | | | | |
| 2.3 | <u>Fasteners</u> | .1 | Nails: to CSA B111-1974, hot dip galvanized steel for exterior work including components located in exterior walls and roofs; bright finish steel in all other locations. Unless otherwise indicated use common spiral flathead nails. | | | | | | | | | | | | | | | | | | | | | |

- | | | | |
|-----|-----------------------|----|---|
| | | .2 | Bolts, nuts, washers: ASTM A307, hot dip galvanized steel. |
| | | .3 | Connectors, anchors, brackets, spikes: hot dip galvanized structural quality steel. |
| | | .4 | Plugs for masonry walls: 4.5 mm galvanized sheet steel wall plugs by Drummond & Reeves, approx. 75 mm deep and 57 mm wide. |
| | | .5 | Screws: to CSA B35.4-1972 zinc, cadmium or chrome plated. |
| | | .6 | Nailing discs: flat caps, minimum 1" diameter, maximum 16 ga thick sheet metal, formed to prevent dishing. Bell or cup shapes not acceptable. |
| 2.4 | Wood Treatment | .1 | Preservative pressure treated components: to CSA, using alkaline copper quaternary (ACQ). |
| | | .2 | Surface, cut, bore and trim components to sizes required as much as possible prior to pressure treatment. |

PART 3 - EXECUTION

- | | | | |
|-----|---|----|--|
| 3.1 | <u>General</u> | .1 | Erect work plumb, level, square and to required lines, Ensure that materials are rigidly and securely attached to each other and to adjacent building elements and will not be loosened by work of other trades. |
| | | .2 | Where other materials and components are to be applied directly over wood members recess heads of fastening devices below wood surfaces. |
| | | .3 | Where work remains exposed to view, fasteners shall be uniformly and evenly spaced and neatly installed. |
| 3.2 | <u>Nailers, Blocking Copings Grounds</u> | .1 | Provide wood nailers, blocking, copings, strapping, bucks, grounds and other rough carpentry components to sizes and in locations required for satisfactory supply of fabricated items and other work. |
| | | .2 | Unless otherwise indicated, provide minimum 38 mm thick material. Grounds may be 21 mm thick material unless otherwise indicated. |
| | | .3 | Install wood members plumb, level, straight, true to line and solidly anchored to adjacent building elements. |
| | | .4 | Provide rough bucks where indicated or required for windows, doors lockers and other elements. |
| 3.3 | <u>Anchors & Fasteners</u> | .1 | Provide rough hardware including nails, screws, bolts, washers, brackets, hangers, and fastening devices of all types. |
| | | .2 | Unless otherwise indicated, attach wood members at maximum 600 mm . o.c. as follows: |
| | | .1 | To concrete and solid masonry with expansion type anchor bolts. |
| | | .2 | To hollow masonry with toggle bolts. |

- .3 To heavy gauge metal with bolts.
- .4 To light gauge metal with screws or bolts.
- .5 To wood with nails, screws or bolts as required to ensure stability.
- .3 Bucks and plates shall be anchored to masonry walls with 13 mm galvanized steel bolts 450 mm long.
- .4 Fasten wood copings to supporting masonry elements with 13 mm galvanized steel bolts min. 450 mm long spaced max. 600 mm o.c. Where width of coping plate exceeds 100 mm, stagger bolts off centre.
- 3.4 **Pressure Treated Components**
 - .1 Use preservative pressure treated lumber and Treated plywood within exterior wall and roof systems and other locations indicated on drawings.
 - .2 Where it is necessary to cut, bore or otherwise alter pressure treated components in the field, treat cut surfaces with heavy coat of wood preservative.

End of Section

1.0 GENERAL

The General Conditions of the Contract, Supplementary Conditions, and the General Requirements of Division 1, form part of this section, and must be read in conjunction with the requirements of this section. The work of this section shall comply with all requirements of Division 1 – General Requirements.

1.1 SECTION INCLUDES

- .1 Materials, preparation and application for caulking and sealant.
- .2 Text to complete other various Sections containing sealant or caulking specifications, including Section [07 52 00 – Modified Bituminous Membrane Roofing].

1.2 RELATED SECTIONS

- .1 Section 04 90 00 – Masonry.
- .2 Section 07 62 00 – Sheet Metal Flashing and Trim.
- .3 Section 08 11 13 – Hollow Metal Doors and Frames
- .4 Section 08 11 16 – Aluminum Doors and Frames.
- .5 Section 08 44 13 – Aluminum Curtain Walls.
- .6 Section 08 51 13 – Aluminum Windows and Operable Sashes.
- .7 Section 08 80 00 – Glass and Glazing

1.3 REFERENCE STANDARDS

- .1 ASTM International
 - .1 ASTM C 510-[16] Standard Test Method for Staining and Color Change of Single- or Multicomponent Joint Sealants.
 - .2 ASTM C 661-[15] Standard Test Method for Indentation Hardness of Elastomeric-Type Sealants by Means of a Durometer.
 - .3 ASTM C 719-[14(2019)] Standard Test Method for Adhesion and Cohesion of Elastomeric Joint Sealants Under Cyclic Movement (Hockman Cycle).
 - .4 ASTM C 794-[18] Standard Test Method for Adhesion-in-Peel of Elastomeric Joint Sealants.
 - .5 ASTM C 834-[17] Standard Specification for Latex Sealants.
 - .6 ASTM C 919-[18], Standard Practice for Use of Sealants in Acoustical Applications.
 - .7 ASTM C 920-[18] Standard Specification for Elastomeric Joint Sealants.
 - .8 ASTM C 1087-[16] Standard Test Method for Determining Compatibility of Liquid-Applied Sealants with Accessories Used in Structural Glazing Systems.
 - .9 ASTM C 1135-[19] Standard Test Method for Determining Tensile Adhesion Properties of Structural Sealants.
 - .10 ASTM C 1184-[18e1] Standard Specification for Structural Silicone Sealants.
 - .11 ASTM C 1193-[16] Standard Guide for Use of Joint Sealants.
 - .12 ASTM C 1247-[20] Standard Test Method for Durability of Sealants Exposed to Continuous Immersion in Liquids.

- .13 ASTM C 1248-[18] Standard Test Method for Staining of Porous Substrate by Joint Sealants.
- .14 ASTM C 1311-[14] Standard Specification for Solvent Release Sealants.
- .15 ASTM C 1330-[18] Standard Specification for Cylindrical Sealant Backing for Use with Cold Liquid Applied Sealants.
- .16 ASTM C 1564-[15] Standard Guide for Use of Silicone Sealants for Protective Glazing Systems
- .17 ASTM D 412-[16] Standard Test Methods for Vulcanized Rubber and Thermoplastic Elastomers—Tension
- .18 ASTM D 2203-[01(2018)] Standard Test Method for Staining from Sealants.
- .19 ASTM D 2240-[15e1] Standard Test Method for Rubber Property—Durometer Hardness
- .20 ASTM D 3960-[05(2018)] Standard Practice for Determining Volatile Organic Compound (VOC) Content of Paints and Related Coatings
- .21 ASTM E 119-[19] Standard Test Methods for Fire Tests of Building Construction and Materials
- .2 Health Canada/Workplace Hazardous Materials Information System (WHMIS) GANA Glazing Manual - 2008.
 - .1 Safety Data Sheets (SDS),

1.4 ADMINISTRATIVE REQUIREMENTS

- .1 Pre-Installation Meeting:
 - .1 Convene pre-installation meeting 1 week prior to beginning work of this Section Consultant to:
 - .1 Verify project requirements.
 - .2 Review installation and substrate conditions.
 - .3 Co-ordination with other building subtrades.
 - .4 Review mock-ups and procedures.
 - .5 Review manufacturer's written installation instructions and warranty requirements.
 - .2 Ensure subcontractor representatives, site supervisor and project manager attend.

1.5 ACTION AND INFORMATIONAL SUBMITTALS

- .1 Product Data:
 - .1 Submit manufacturer's instructions, printed product literature and data sheets for joint sealants and include product characteristics, performance criteria, physical size, finish and limitations.
 - .2 Manufacturer's product to describe:
 - .1 Caulking compound.
 - .2 Primers.
 - .3 Joint backing.
 - .4 Sealing compound, each type, including compatibility when different sealants are in contact with each other.
 - .3 Submit 2 copies of WHMIS SDS.
- .2 Samples:

- .1 Submit 2 samples of each type of material and colour.
- .2 Cured samples of exposed sealants for each colour where required to match adjacent material.
- .3 Manufacturer's Instructions:
 - .1 Submit instructions to include installation instructions for each product used.

1.6 CLOSEOUT SUBMITTALS

- .1 Operation and Maintenance Data: submit operation and maintenance data for incorporation into manual.
- .2 Warranty Documentation: Submit Warranty Documents Specified.

1.7 QUALITY ASSURANCE

- .1 Perform the work in accordance with the manufacturer's written project recommendations.
- .2 Obtain each type of joint sealant through one source from a single manufacturer.
- .3 Qualifications:
 - .1 The installation of the sealant work shall be performed by a recognized specialized applicator, having at least five (5) years of experience, with skilled mechanics, thoroughly trained and competent in all phases of the work.
- .4 Mock-up:
 - .1 Construct mock-ups two (2) weeks prior to commencement of the work to demonstrate all of the joints encountered in this project.
 - .2 The mock-ups shall be 1 m in length for each type of sealant and substrate.
 - .3 Locate mock-ups where directed by the Consultant.
 - .4 The mock-ups shall demonstrate the surface preparation prior to the sealant installation and the location, size, shape, colour, depth of joints, and adhesion and cohesion, complete with back-up material, primer, and new sealant.
 - .5 Allow 48 hours for inspection by the Consultant before proceeding with the sealant work.
 - .6 Upon receipt of written confirmation from the Consultant, the mock-up may remain as part of the finished work.
 - .7 The approved mock-up shall be the standard to which all work shall be performed.
 - .8 The mock-up shall be performed prior to the pre-installation conference

1.8 DELIVERY, STORAGE AND HANDLING

- .1 Deliver, store and handle materials in accordance with manufacturer's written instructions.
- .2 Delivery and Acceptance Requirements: deliver materials to site in original factory packaging, labelled with manufacturer's name and address.
- .3 At time of delivery, the Contractor is to verify the sealant expiry dates. Any sealants that have expired or will expire prior to installation are to be returned to the supplier/manufacturer and should not be accepted on site.
- .4 Storage and Handling Requirements:
 - .1 Store materials off ground, in dry location and in accordance with manufacturer's recommendations in clean, dry, well-ventilated area.
 - .2 Store and protect joint sealants from nicks, scratches, and blemishes.

- .3 Replace defective or damaged materials with new.

1.9 SITE CONDITIONS

- .1 Ambient Requirements:
 - .1 Proceed with installation of joint sealants only when:
 - .1 Ambient and substrate temperature conditions are within limits permitted by joint sealant manufacturer or are above 4.4 degrees C.
 - .2 Joint substrates are dry.
 - .3 Conform to manufacturer's recommended temperatures, relative humidity, and substrate moisture content for application and curing of sealants including special conditions governing use.
 - .2 Joint-Substrate Conditions:
 - .1 Proceed with installation of joint sealants only after contaminants capable of interfering with adhesion are removed from joint substrates

1.10 ENVIRONMENTAL REQUIREMENTS

- .1 Comply with requirements of Workplace Hazardous Materials Information System (WHMIS) regarding use, handling, storage, and disposal of hazardous materials. Labelling and provision of Safety Data Sheets (SDS) shall be acceptable to Health Canada.
- .2 Ensure that all materials, containers, rags, etc. are disposed of in accordance with the local Waste Management Plan and hazardous material disposal regulations and requirements.
- .3 Ventilate area of work by use of approved portable supply and exhaust fans.
- .4 VOC limit 250 g/L maximum.

1.11 ALTERNATIVES

- .1 Alternatives to manufacturer's brands or supply sources of materials will not be accepted.

1.12 WARRANTY

- .1 Contractor shall provide a warranty by the sealant manufacturer covering a period of five (5) years for all labour and materials from the date of Substantial Performance of the contract agreeing to furnish sealants to repair or replace those that do not comply with performance and other requirements specified in this Section within the specified warranty period.
- .2 Defective work shall include, but is not limited to, joint leakage, cracking, crumbling, melting, running, loss of adhesion or loss of cohesion, and substrate staining.

1.13 ANTICIPATED FIELD TESTING PROGRAM

- .1 Material and adhesion tests shall be conducted at the discretion of the Consultant on a random basis to show that properties are appropriate to the particular sealant and proper bond is achieved.
- .2 Extent of testing shall be as follows:
 - .1 Ten (10) tests for the first 1 000 feet (300 m) of joint length for each type of elastomeric sealant and joint substrate.
 - .2 One (1) test for each 1 000 feet (300 m) of joint length therefore or one test per each floor per elevation.
- .3 The Contractor shall repair all test areas as part of the work in accordance with this section.

- .4 All sealant installation failing material and adhesion tests shall be rectified in accordance with manufacturer and Consultant approved methods. Rectified areas will be retested until results confirm compliance with the manufacturer's written requirements

Part 2 Products

2.1 SEALANT

- .1 Porous Substrates (Clay Brick, Concrete, Stone, etc.)
 - .1 Dow Corning 790 Silicone Building Sealant manufactured by Dow Corning Corporation.
 - .2 Dow Corning 756 SMS; Silicone Building Sealant manufactured by Dow Corning Corporation.
 - .3 Dow Corning CCS (Contractors Concrete Sealant) manufactured by Dow Corning Corporation.
 - .4 Silpruf NB SCS 9000 manufactured by GE Silicones.
 - .5 Spectrem 1 manufactured by Tremco Ltd.
 - .6 Spectrem 2 manufactured by Tremco Ltd.
- .2 Non-porous Substrates (Glass, Metal, etc.)
 - .1 Dow Corning 756 SMS Silicone Building Sealant manufactured by Dow Corning Corporation.
 - .2 Dow Corning 791 manufactured by Dow Corning Corporation.
 - .3 Dow Corning 795 manufactured by Dow Corning Corporation.
 - .4 Dow Corning CWS (Contractor's Weather Sealant) manufactured by Dow Corning Corporation.
 - .5 Spectrem 1 manufactured by Tremco Ltd.
 - .6 Spectrem 2 manufactured by Tremco Ltd.
- .3 Porous Substrate/Metal Substrate
 - .1 Dow Corning 756 SMS Silicone Building Sealant manufactured by Dow Corning Corporation.
 - .2 Dow Corning 790 Silicone Building Sealant manufactured by Dow Corning Corporation.
 - .3 Dow Corning Contractors Weatherproofing Sealant (CWS)
 - .4 SilPruf NB SCS 9000 manufactured by GE Silicones.
 - .5 Spectrum 1 manufactured by Tremco Ltd.
 - .6 Spectrem 2 manufactured by Tremco Ltd.
- .4 Continuous Immersion – Applicable for Potable Water (Not for Chlorine/Bromine Exposure, i.e. pool water)
 - .1 Vulkem 116 manufactured by Tremco Ltd.
 - .2 Vulkem 45 SSL manufactured by Tremco Ltd.
- .5 Self-Levelling
 - .1 Vulkem 45 SSL manufactured by Tremco Ltd.
 - .2 Sikaflex 2C SL manufactured by Sika Canada.
 - .3 THC-901 manufactured by Tremco Ltd.

- .6 Interior – Applicable for Window Perimeter
 - .1 Tremflex 834 manufactured by Tremco Ltd
- .7 Acoustic Sealant
 - .1 Tremco Acoustical Sealant manufactured by Tremco Ltd.
- .8 Butyl Rubber
 - .1 Butyl Sealant manufactured by Tremco Ltd.
- .9 Self-Adhered Waterproof SBS Membrane Sealant
 - .1 Dow Corning 758 Silicone Weather Barrier Sealant manufactured by Dow Corning Corporation.
- .10 Silicone Sealant with Fungicides: for use in washrooms and Food Prep areas, (interior counter back splash and washroom fixtures):
 - .1 SCS1700 Sanitary Silicone Sealant by GE Silicones.
- .11 Sealant colour to later selection by Consultant and/or Owner from manufacturer's full range of colours.
- .12 The Contractor shall obtain written confirmation of the sealant suitability for this project. A copy of this confirmation shall be forwarded to the Consultant prior to commencing with the work of this section.

2.2 PRIMERS

- .1 Primer shall be as specified by the sealant manufacturer.

2.3 JOINT BACKING

- .1 Butt Joint and Bridge Joint Applications
 - .1 Cylindrical Sealant Backing, of size and density to control sealant depth and otherwise contribute to producing optimum sealant performance. Material shall be of type that will not adhere to the specified sealant:
 - .1 Closed-cell material (i.e. polyethylene) with a surface skin. Do not puncture backer; rod may cause bubbling in sealant.
 - .2 Bi-cellular material with a surface skin.
 - .3 [Open-cell foam backer rod shall be used for the exterior (secondary) sealant bead in a two-stage sealant joint].
 - .4 [Open-cell material OR Open cell foam backer rod shall not be used on this project].
 - .2 Where the joint size cannot accommodate foam rod, polyethylene tape or other joint backing material recommended by sealant manufacturer shall be used.
- .2 Fillet Joint Applications
 - .1 Bond breaker tape, polyethylene tape or other plastic tape recommended by the sealant manufacturer shall be used to prevent adhesion to the specified sealant or to the back of joint.

2.4 CLEANING AGENT

- .1 Non-corrosive and non-staining type, compatible with joint forming materials and sealant in accordance with sealant manufacturer's written recommendations.
- .2 Primer: in accordance with sealant manufacturer's written recommendations.

2.5 MASKING TAPE

- .1 Non-staining, non-absorbent material compatible with joint sealant and surface adjacent to joints.

Part 3 Execution

3.1 EXAMINATION

- .1 Verification of Conditions: verify that conditions of substrate previously installed under other Sections or Contracts are acceptable for joint sealants installation in accordance with manufacturer's written instructions.
 - .1 Visually inspect substrate in presence of Consultant.
 - .2 Inform Consultant of unacceptable conditions immediately upon discovery.
 - .3 Proceed with installation only after unacceptable conditions have been remedied and after receipt of written approval to proceed from Consultant.
- .2 The Contractor shall arrange for the sealant Manufacturer's representative to visit the site and review the surface preparation and installation procedures at the start of the work.

3.2 PREPARATION

- .1 Consult and follow the sealant manufacturer's project recommendations.
- .2 Remove the existing sealant around the joints and penetrations without causing damage to the substrates.
- .3 Examine joint sizes and conditions to establish correct depth to width relationship for installation of backup materials and sealants.
- .4 Clean bonding joint surfaces of harmful matter substances including dust, rust, oil grease, and other matter which may impair Work.
- .5 Do not apply sealants to joint surfaces treated with sealer, curing compound, water repellent, or other coatings unless tests have been performed to ensure compatibility of materials. Remove coatings as required.
- .6 Ensure joint surfaces are dry and frost free.
- .7 Do not apply sealant to masonry until mortar has cured. Refer to Section 04 90 00 – Masonry.
- .8 Butt and Bridge Joint Applications
 - .1 Examine the joint sizes and correct as required to allow for the anticipated movement and to achieve proper width / depth ratio in accordance with the manufacturer's recommendations for the specified sealant unless indicated differently on the drawings, or by the Consultant.
 - .2 Should joint width correction be required, ensure that the correction is distributed appropriately to each side of joint.
- .9 Fillet Joint Applications
 - .1 Remove oil, grease and other coatings from non-ferrous metals with an approved cleaning solvent or abrasive technique. Obtain approval from the Consultant prior to commencing.

3.3 PRIMING

- .1 Where necessary to prevent staining, mask adjacent surfaces prior to priming and caulking.
- .2 Prime sides of joints in accordance with sealant manufacturer's instructions immediately prior to caulking.
- .3 Primers that require application by the wipe of a clean soft cloth, shall be poured onto the cloth. Do not dip the cloth into the primer container.
- .4 Prime only as much area as can be sealed in the same working day

3.4 BACKUP MATERIAL

- .1 Cylindrical Sealant Backing:
 - .1 Install the backer rod without stretching, twisting, braiding or puncturing the outer skin. Do not leave gaps between ends of sealant backings.
 - .2 Use an approved installation tool that is blunt surfaced and is designed accurately to place the backer rod.
 - .3 Using the approved tool, smoothly and uniformly place the backer rod to the recommended joint depth and rod compression.
 - .4 The minimum compression of the foam backer rod is twenty-five (25) percent. Vary backer rod size as required to achieve specified compression.
- .2 Bond Breaker Tape:
 - .1 Install bond breaker tape without stretching, twisting or puncturing the tape.
 - .2 Use an approved installation tool that is blunt surfaced and is designed accurately to place tape within the joint.
 - .3 Width of bond breaker tape shall fit exactly the width of the joint.
 - .4 Install tape at the back of the joint.
 - .5 Do not leave gaps between ends of bond breaker tape.
- .3 Three-sided adhesion is not permitted.
- .4 Foam backer rod shall only be installed in areas that can be sealed in the same working day.

3.5 MIXING

- .1 Mix materials in strict accordance with sealant manufacturer's instructions.

3.6 APPLICATION

- .1 Sealant:
 - .1 The Contractor shall have a trained representative on site at all times who is responsible for all sealant applications.
 - .2 Perform all work in strict accordance with the manufacturer's printed instructions. The Contractor shall provide the Consultant a copy of these instructions prior to commencing with the injection and sealing operations.
 - .3 Mask edges of joint where irregular surface or sensitive joint border exists to provide neat joint.
 - .4 Apply sealant in continuous beads.
 - .5 Apply sealant using gun with proper size nozzle.
 - .6 Use sufficient pressure to fill voids and joints solid.

- .7 Form surface of sealant with full bead, smooth, free from ridges, wrinkles, sags, air pockets, embedded impurities.
- .8 Tool exposed surfaces before skinning begins to give slightly concave shape.
- .9 Remove excess compound promptly as work progresses and upon completion.
- .2 Curing:
 - .1 Cure sealants in accordance with sealant manufacturer's instructions.
 - .2 Do not cover up sealants until proper curing has taken place

3.7 TWO-STAGE SEALANT JOINT

- .1 A two-stage sealant bead consists of two sealant beads separated by a drained air space with each sealant bead having its own appropriate joint backing material.
- .2 The interior sealant bead shall be allowed to fully cure prior to the installation of the exterior bead. Sealant cut tests to confirm adhesive properties must be completed by the Consultant and repaired by the Contractor prior to the installation of the exterior bead. Obtain written confirmation from the Consultant prior to proceeding with the installation of the exterior bead.
- .3 A minimum of 25 mm must be maintained between the exterior face of the interior sealant bead and the back of the joint backing material for the exterior bead.
- .4 The Contractor is to ensure that the installation of a primer or surface preparation procedures for the interior sealant bead do not inhibit the adhesion of the exterior sealant bead.
- .5 At the intersection of horizontal and vertical sealant joints, return the horizontal interior sealant bead to interface with the exterior sealant bead closing the air space between sealant beads.
- .6 Install gap in the exterior vertical sealant joint at all intersections of horizontal and vertical sealant joints as per the details

3.8 ROUT AND SEAL REPAIRS

- .1 Grind sides of crack to a minimum width of 6mm and depth of 6mm (1/4 inch).
- .2 Apply bond breaker tape inside the joint.
- .3 Fill the joint with sealant. Tool sealant following application

3.9 CLEANING

- .1 Progress Cleaning:
 - .1 Leave Work area clean at end of each day.
 - .2 Clean adjacent surfaces immediately.
 - .3 Remove excess and droppings, using recommended cleaners as work progresses.
 - .4 Remove masking tape after initial set of sealant
- .2 Final Cleaning:
 - .1 Upon completion remove surplus materials, rubbish, tools and equipment.
 - .2

3.10 PROTECTION

- .1 Protect installed products and components from damage during construction.
- .2 Repair damage to adjacent materials caused by joint sealants installation.

END OF SECTION

PART 1 - GENERAL

- | | | | | |
|-----|--|----|--|---------------|
| 1.1 | <u>General Requirements</u> | .1 | Comply with requirements of Division 1. | |
| 1.2 | <u>Related Sections</u> | .1 | Installation of finish hardware | Section 08100 |
| 1.3 | <u>Scope of Work</u> | .1 | Supply only of | |
| | | .1 | Finishing Hardware | |
| 1.4 | <u>Quality Assurance</u> | .1 | The products listed in the finishing hardware schedule establish the minimum quality standards for this project. Deviations are not permitted. | |
| | | .2 | Companies tendering this project shall retain a qualified Architectural Hardware Consultant (A.H.C.) who will assume responsibility relative to their profession. | |
| | | .3 | Finishing Hardware companies tendering on this project shall BID only those products specified, or for the purpose of tendering products listed here in as equivalents. Alternates will be allowed only as outlined in Section 2.1. | |
| | | .4 | The Architect's Consultant will be provided with a copy of the approved hardware schedule and all approved change notices to complete a quality assurance inspection at completion of the project. It will be the hardware supplier's responsibility to correct any hardware found to be improperly supplied, including installation, painting and reworking of doors and/or frames. | |
| 1.5 | <u>Handling, Delivery and Storage</u> | .1 | Package finishing hardware for each opening, identified shall correspond with hardware schedule. | |
| | | .2 | Copy of finishing hardware schedule shall accompany hardware shipments. | |
| | | .3 | Deliver all hardware to job site and obtain signed receipt. | |
| | | .4 | The general contractor shall provide on site an adequate, enclosed, lockable, clean and dry storage area. Access to locked storage area will be the responsibility of the general contractor. | |
| | | .5 | All hardware shall be checked in jointly by representatives of the general contractor and hardware supplier to avoid discrepancies. | |
| | | .6 | The general contractor shall protect the finish and function of the installed hardware from the other trades (paint, plaster, cleaners, etc.) during the construction period. | |

- 1.6 **Warranty** .1 Submit a written warranty covering finish hardware against defects in materials and workmanship. The warranty period shall be two years generally and five years for closers. Warranty commences on date of Substantial Completion.
- .2 Hardware products found defective within warranty period shall be removed by the general contractor or owner and returned to the distributor for evaluation.
- 1.7 **Submittals** .1 Submit templates when requested to contractor for use by installers and fabricators as required for proper location and installation of hardware.
- .2 Submit 4 (four) copies of the hardware schedule complete with a list and legend of abbreviations used. It is the Suppliers responsibility to thoroughly check the Hardware Schedule and working drawings to ensure, all handlings are correct, product will function as listed and that there are no errors or omissions before submitting for approval.
- .3 Upon request submit physical samples of each type of hardware for the project. Samples which may be required shall be tagged for their intended use and shall be incorporated into the supply of finishing hardware.
- .4 Supply wiring schematics and product information for all electronic hardware supplied under this section.
- 1.8 **Codes and Regulations** .1 All hardware listed or furnished shall meet requirements of Federal, Provincial and Local Codes having jurisdiction over this installation.

PART 2 - PRODUCTS

- 2.1 **Manufacturers** .1 The following is a list of acceptable manufacturers for work under this contract. The listed acceptable alternative manufacturers must provide products which are of equal quality of better than the specified manufacturers products.

	Manufacturer As Specified	Acceptable Alternative Manufacturer
Hinges	Stanley	Hager
Locks	Schlage	No substitution
Exit Devices	Sargent	Von Duprin (Full stainless steel)
Closers	LCN4041 Cush	Sargent 351 PS
Kickplates	Gallery	Hager/CBH
Push/Pulls	Gallery	Hager/CBH
Overhead Stops	Sargent Glynn Johnson	
Weatherstrip	Hager	KN Crowder National Guard

PART 3 - EXECUTION

- 3.1 **Execution**
- .1 The contractor installing the hardware shall carefully follow manufacturer's instructions for installation of all finish hardware.
 - .2 The finish hardware installer shall be experienced in the installation of architectural hardware and have general knowledge of the functions of the various types of hardware.
 - .3 Thru bolts for door pulls are to be counter sunk and concealed by push plates where push plates are listed.
 - .4 Manufacturer's fasteners supplied are to be used. It is the installers responsibility to ensure fasteners are not over tightened or stripped by use of screw guns, etc.
 - .5 Provide finished hardware for all display cases. Refer to Architectural drawings for locations.
- 3.2 **Keying**
- .1 All locks shall be interchangeable core and to be keyed to a factory registered master key system.
 - .2 Furnish the following quantities of keys:
 - 2 Grand master keys
 - 3 Master keys per level
 - 2 Change keys per lock
 - 10 Construction keys
 - .3 All permanent Cores and Keys are to be delivered to the end user.
- 3.3 **Adjusting**
- .1 It is the hardware installer's responsibility to adjust the hardware as per the manufacturer's specifications. Final adjustments to closers shall be made at final completion of products.
- 3.4 **Documentation**
- .1 The finish hardware supplier shall include copies of the as-built finishing hardware schedule, and maintenance manuals to the owner on completion of this project.
- 3.5 **Finishes**
- | | | |
|----|-------------------------------|--|
| .1 | Standard N.B.H.A. Code | BHMA Base Material & Description Code |
| | 32D | 630 Stainless Steel, Satin |
| | EN | 689 Silver Enamel |
| | CH | Charcoal Grey |
- 3.6 **Hardware Schedule**
- .1 Refer to the Finishing Hardware List, dated _____ prepared by Empire Hardware Ltd included within this section.

End of Section

1.0 GENERAL

1.1 GENERAL REQUIREMENTS

- .1 The General Conditions of the Contract, Supplementary Conditions, and the General Requirements of Division 1, form part of this section, and must be read in conjunction with the requirements of this section. The work of this section shall comply with all requirements of Division 1 – General Requirements.

1.2 SECTION INCLUDES

- .1 Provision of all labour, materials, equipment and incidental services necessary to cover with paint the interior surfaces of the building or structure, and the building services and accessories not otherwise protected or covered, to the full intent of the drawings and specifications.
- .2 Surface preparation of substrates to receive painting and finishing is included in this section of work.
- .3 This section of work shall include the painting and finishing of all exposed surfaces of the following substrates:
 - .1 Wood
 - .2 Steel (Prime-painted & galvanized)
 - .3 Concrete
 - .4 Masonry
 - .5 Gypsum board surfaces
 - .6 All exposed surfaces and materials not factory finished / prefinished

1.3 REFERENCE STANDARDS

- .1 CAN2-85.100, National Standards of Canada, Painting.
- .2 Master Painters Institute (MPI) Architectural Painting Specification Manual.

1.4 MATERIALS AND EQUIPMENT NOT TO BE PAINTED

- .1 Surfaces not to be painted shall be left completely free of droppings, over-spray, or accidentally applied materials resulting from the work of this Section.
- .2 Items not to be painted include concealed structural elements, and equipment furnished with complete factory-applied, coloured paints and finish systems.

1.5 COOPERATION WITH OTHER TRADES

- .1 Schedule and coordinate this work with other trades and do not proceed until other work and/or job conditions are as required to achieve satisfactory results.
- .2 Examine all specification sections for materials and products and become thoroughly familiar with all provisions regarding painting.

1.6 QUALITY ASSURANCE

- .1 Acceptable Manufacturers
 - .1 Paints Stains and varnish.
 - .1 Benjamin Moore
 - .2 Sherwin Williams
 - .3 ICI (Glidden) Paints
 - .4 Para Paints
 - .5 Pratt & Lambert
 - .6 Sico Coatings
 - .2 All paints and finish products to be best quality from manufacturers listed
- .2 Applicators
 - .1 The painting subcontractor shall have a minimum of five (5) years documented experience in commercial painting and finishing, and shall maintain a qualified crew of size necessary to fully satisfy the requirements of this section.
- .3 Pre-application Meeting
 - .1 Convene a pre-application meeting for the Products specified in this section. Attendees must include, as a minimum, representatives of the following:
 - .1 Contractor (Site Superintendent & Project Manager)
 - .2 Application Subcontractor (Site Foreman & Project Manager)
 - .3 Product Manufacturers and/or Distributors (Technical Representatives)
 - .4 Related Subcontractors (i.e.. Mechanical and/or Electrical)

1.7 MOCK-UP REQUIREMENTS

- .1 Finish one complete room of each colour scheme required, showing selected materials, colours and textures. Have Consultant review mock-up for acceptance of colour and finish, prior to ordering of materials for further work.
- .2 Consultant reserves the right to change colour and/or finish selection upon review of mock-up, if deemed unacceptable.
- .3 Refinish rejected areas until acceptance is achieved.
- .4 Once approved by the Consultant, mock-ups shall serve as the minimum acceptable standard for similar work throughout the Project.

1.8 COLOUR SCHEDULE

- .1 Refer to the Room Finish Schedule and the Colour Schedule for colours and surface textures of all finishes. The final selection shall rest solely with the Consultant.

1.9 COMPLETION SCHEDULE

- .1 Furnish the Consultant with a schedule showing expected completion of the respective coats of paint for the various areas and surfaces. Keep this schedule current as the job progresses.

1.10 SUBMITTALS

- .1 Product Codes
 - .1 Submit a complete list of product codes from the manufacturer(s) proposed for use on this project, for all products listed in finish systems specified herein, in accordance with Section 01 30 00.
- .2 Samples
 - .1 Submit samples of all paints and finishes specified herein, in accordance with Section 01 30 00.
 - .2 Submit triplicate (8" x 12") 200 x 300mm sample panels of each type of paint and finish application for approval by the Consultant.
 - .3 Where manufacturer of paint differs from that listed in the colour schedule, employ spectrograph technology to ensure accurate colour match. Selection of the "next nearest colour" by another manufacturer will not be acceptable.
 - .4 Use birch plywood for wood finishes, gypsum board for paint finishes over smooth surfaces. Refer to Mock-up Requirements for masonry finishes.
 - .5 Finished work to match approved samples.
 - .6 The Consultant reserves the right to alter colour selections following sample review.

1.11 DELIVERY, STORAGE AND HANDLING

- .1 Paint and finish materials shall be delivered to the site in sealed original labelled containers bearing manufacturer's name, type of paint, brand name, colour designation and instructions for mixing and/or reducing.
- .2 Store materials in a heated, dry, well-ventilated, indoor place having a minimum ambient temperature of (45°F) 7°C.
- .3 Keep waste rags in metal drums and remove all rags, waste and trash from the building at the end of each working shift.
- .4 Provide CO2 fire extinguisher of minimum (20 lb) 9kg capacity in storage area.
- .5 Ensure that health and fire regulations are complied with in storage area.

1.12 GENERAL COLOUR REQUIREMENTS

- .1 Refer to the Room Finish Schedule and the Colour Schedule for type and extent of finishes, and for individual colour and sheen selections.
- .2 Where manufacturer of paint differs from that listed in the colour schedule, employ spectrograph technology to ensure accurate colour match. Selection of the "next nearest colour" by another manufacturer will not be acceptable.

- .3 The following, generally, will be painted colour, and sheen to match adjacent surfaces
 - .1 Access doors and electrical panel covers in public spaces including resource rooms and classrooms
 - .2 Exposed piping, conduit, and ductwork.
 - .3 Unfinished exposed materials.
- .4 Access doors and electrical panel covers shall be powder coated with colour to match adjacent wall colour.

1.13 ENVIRONMENTAL CONDITIONS

- .1 Temperatures: No painting shall be performed when substrate or ambient air temperatures are below (41°F) 5°C. Minimum allowable temperature for application of Latex paints is (45°F) 7°C.
- .2 Relative humidity: shall not exceed 85%.
- .3 Moisture content of substrates: Masonry and concrete materials shall be allowed to cure for a minimum of 28 days before application of paints. Substrates shall be measured by electronic moisture meter, to the following maximums:
 - .1 Plaster and Gypsum board: 12%.
 - .2 Masonry, concrete/concrete block: 12% for solvent based paints.
 - .3 Wood: 15%.
- .4 Lighting: Painting shall not proceed unless a minimum of (15 cd/ft²) 1.3 lx lighting is provided on the surfaces to be painted.
- .5 Ventilation: All areas where painting is proceeding require adequate continuous ventilation and sufficient heating facilities to maintain temperatures above (45°F) 7°C for 24 hours before during and after paint application.

1.14 MAINTENANCE MATERIALS

- .1 Supply Owner with one clearly identified, new and unopened gallon of each colour and type of paint, stain and varnish used for this work, in accordance with Section 01 78 00.
- .2 All colour mixing codes must be clearly labeled, and colour numbers (P1, P2, etc.) must be marked on the container.

1.15 EXTENDED WARRANTY

- .1 Provide upon completion of the work, a Warranty Certificate, in the name of the Owner, stating that the work of this section was performed in accordance with these specifications and the MPI manual (latest edition), and is warranted against defects in material or installation, for a period of two (2) years from Date of Substantial Performance.

2.0 PRODUCTS

2.1 MATERIALS

- .1 Paint, varnish, stain, enamel, lacquer and fillers shall be of a type and brand herein specified and/or listed under Chapter 5 (Approved Products List) of the MPI manual.

- .2 Paint materials such as linseed oil, shellac, turpentine, and any materials not specified herein but required for first class work with the finish specified shall be the highest quality product of an approved manufacturer. All materials shall be compatible with finish paint or coating materials.

2.2 MIXING

- .1 Paints shall be ready-mixed unless otherwise specified, except that any coating in paste or powder form, or to field-catalyzed shall be field-mixed in accordance with the directions of its manufacturer. Pigments shall be fully ground and shall maintain a soft paste consistency in the vehicle during storage that can and shall be dispersed readily and uniformly by paddle to a complete homogeneous mixture.
- .2 The paint shall have good flow and brush properties and shall dry or cure free of sags or runs to yield the desired finish specified.

2.3 GLOSS LEVELS

- | | | | |
|----|-----------------------------|------------|------------|
| .1 | MPI Gloss and Sheen Levels; | Gloss @60° | Sheen @85° |
| | Level G1 – (Flat): | max. 5 | max. 10. |
| | Level G2 – (Velvet): | max. 10 | 10-35. |
| | Level G3 – (Eggshell): | 10-25 | 10-35. |
| | Level G4 – (Satin): | 20-35 | min.35. |
| | Level G5 – (Semi-Gloss): | 35-70. | |
| | Level G6 – (Gloss): | 70-85. | |
| | Level G7 – (High Gloss): | 85. | |
- .2 Provide Level G5 (Semi-Gloss) finish in corridors, stairwells, washrooms, service rooms, metal work and elsewhere where noted on the Room Finish Schedule.
- .3 Provide Level G3 (Egg Shell) finish in all classrooms and offices

3.0 EXECUTION

3.1 INSPECTION OF SURFACES

- .1 Examine surfaces to receive paint finishes for defects which cannot be corrected by procedures specified herein, and which may result in unsatisfactory paint finishes. Report items to the Consultant and the Contractor in writing, prior to commencement of work of this section, or after initial prime coat shows defects in substrate.
- .2 The application of subsequent prime and finish coats shall be construed as acceptance of the surfaces, and thereafter this subcontractor shall be fully responsible for satisfactory work as required herein.

3.2 PREPARATION OF SURFACES

- .1 Refer to the MPI manual Chapter 3 for surface preparations not specified in this section.
- .2 Perform mandatory surface cleaning and preparation prior to commencing work of this section

3.3 PROTECTION

- .1 Protect all adjacent surfaces from paint and damage resulting from the work of this section and make good any damage caused by failure to provide such protection.
- .2 Mask all adjacent finishes and surfaces with masking tape as required. Remove tape promptly after final finish coat has been applied and allowed to dry.
- .3 Furnish sufficient drop cloths, shields and protective equipment to prevent spray or dropping from fouling surfaces not being painted or where painting has been completed.
- .4 Cotton waste, cloths and material, which may constitute a fire hazard, shall be placed in closed metal containers and removed daily from the site.
- .5 Remove and protect, prior to painting operations, all hardware, accessories, device plates, lighting fixtures, factory finished work, and similar items, or provide ample in-place protection such as masking tape. If removed, these items shall be labelled, stored, cleaned if necessary and re-installed following successful completion of the work in each area. Solvents detrimental to lacquer finishes are not to be used for cleaning these items.

3.4 APPLICATION

- .1 Apply paints and coatings by currently accepted trade methods. Application of primers and finishes shall be by brush, roller, spray, or a combination of those methods.
- .2 Painting coats specified are intended to cover surfaces satisfactorily when applied in strict accordance with manufacturer's recommendations. Where proper coverage has not been attained, the Consultant may ask for additional coats as required, at no additional cost.
- .3 Apply each coat at the proper consistency. Sand lightly between coats.
- .4 Tint primers to same colour range as finish coats.
- .5 Do not apply finishes on surfaces that are not sufficiently dry. Each coat of finish should be dry and hard before a following coat is applied unless specified otherwise by the manufacturer.
- .6 Tint filler to match wood for clear finishes. Work filler well into wood grain and remove excess prior to setting.
- .7 Interior woodwork to receive paint or enamel finish shall be back-primed upon arrival on site with enamel undercoater.
- .8 All edges of wood doors shall be primed with undercoater, stain, or varnish, as required by specified finish.
- .9 Where spraying of paint is required by surface conditions, mask and seal off areas to be sprayed, and back-roll all coats. Provide ventilation for areas to be sprayed.
- .10 Where spray painting is specified, finish (100ft²) 10m² by spraying a sample of the finish upon the request of the Consultant, using materials specified.

- .11 Provide complete coverage and hide. When colour, stain, dirt or undercoats show through final coat of paint, provide additional coats until the paint film is of uniform finish, colour, appearance and coverage, at no additional cost to the Owner.
- .12 Allow all coats to dry to manufacturer's recommendations before applying succeeding coats.
- .13 Touch up all suction spots or "hot spots" in concrete after the application of the first coat, before applying the second coat.
- .14 Surfaces to be stained shall appear uniform in shading with colour variations caused only by the natural wood grain.
- .15 Barricade areas where finishing is in progress to prevent traffic or other activities, and otherwise protect work until dry. Post "Wet Paint" signs and remove when no longer required.
- .16 Replace at the expense of this section, materials soiled or damaged by finishing materials which cannot be removed.
- .17 **New block masonry:**
 - 1. Do not apply finish coats until block filler application has been inspected to identify visible pin holes. Should visible pin holes be identified, additional coats of block filler are to be applied until there are no visible pin holes.
 - 2. Where inspections identify pin holes on a finished surface, the area noted shall be repainted first with block filler then the entire wall plane is to be refinished.

3.5 PAINTING AND FINISHING OF EXISTING MATERIALS AND SURFACES

- .1 Remove, label and store, prior to painting of existing materials and surfaces the following items:
 - .1 Door hardware signage and accessories,
 - .2 Device plates,
 - .3 Lighting fixtures,
 - .4 Factory finished work,
 - .5 Signage where removable.
- .2 Where such items are not removable, provide proper masking and protection prior to commencement of painting.
- .3 Clean such items if deemed necessary by the Consultant, before being re-installed following successful completion of the work in each area. Solvents detrimental to lacquer finishes are not to be used for cleaning these items.
- .4 All surface contaminants such as wax, oils, grease, dirt, tire marks (horizontal surfaces), etc., must be removed from the surface. Oil and grease can be removed by detergent cleaning, followed by a rinse with clean water; solvent cleaning can be used as an alternative on areas with a concentration of oil or grease. All loose and flaking paint must be removed by hand cleaning, power tool cleaning, or pressure washing.
- .5 All blisters must be removed from the surface and the edges feathered. Areas showing mildew growth must be treated. Glossy finishes must be 'dulled' by sanding, by a TSP treatment, or by sweep blasting to create an anchor pattern to promote adhesion of the new coating.

- .6 Rust stains can be removed with an oxalic acid treatment. If large amounts of efflorescence is present, mechanical removal (e.g. abrasive sweep blasting or power tool grinding) may be required, after which acid etching shall be performed.
- .7 After any application of muriatic acid, the surface must be flushed with large amounts of clean water to remove any residue, and then allowed to dry thoroughly. The pH of the surface shall be tested, as specified in 1.2 pH Testing before the application of paint. All bare areas must be spot primed.

3.6 PAINTING APPLICATION SCHEDULE

- .1 Application of finishes on various material surfaces to be as follows:
 - .1 **Concrete Finishing Systems** (Low contact areas – Mechanical, Electrical and Service Rooms where noted on Room Finish Schedule)
 - .1 Concrete Horizontal Surfaces; Premium Grade Finish.
 - .1 Concrete Floor Sealer, Gloss/Sheen – G3.
 - .2 Epoxy Concrete Floor Sealer
 - .2 **Masonry Finishing Systems; Premium Grade Finish**
 - .1 **Concrete Masonry Units – Previously Painted.**
 - Latex super adherent primer – 1 coat
 - Latex pre-catalyzed water based epoxy (LEP) – 2 coats or latex G3 or G5 where noted on Room Finish Schedule.
 - .2 **Concrete Masonry Units – New.**
 - Latex block filler – 2 coats (for lightweight block -apply additional coat)
 - Latex pre-catalyzed water-based epoxy (LEP) – 2 coats or latex G3 or G5 where noted on Room Finish Schedule.
 - .3 **Metal Finishing Systems**
 - .1 **Structural Steel; Premium Grade Finish.**
(Low contact overhead structural steel ductwork and decking)
 - Dry Fall (over Q.D. shop primer), Gloss/Sheen G2.
 - .2 **Metal Fabrications; Premium Grade Finish.**
(High contact doors and frames, railings, balustrades, etc)
 - Latex super adherent metal primer.
 - Latex pre-catalyzed water-based epoxy (LEP) – 2 coats Gloss/Sheen – G5.
 - .4 **Wood Finishing Systems**
 - .1 **Painted Wood** (miscellaneous wood items); Premium Grade (3-coat) Finish.
 - Latex Gloss/Sheen -G4.
 - .2 **Clear Finish Wood** (miscellaneous wood items); Premium Grade (3-coat) Finish.
 - .1 Clear Polyurethane (single component) finish, Gloss/Sheen -G4.

- .5 **Plaster & Gypsum Board Finishing Systems**
 - .1 **Gypsum Board; (walls)** Premium Grade Finish.
 - Latex water based epoxy (LEP) (over latex primer sealer), Gloss/Sheen – G3.
 - .2 **Gypsum Board; (ceilings)** Premium Grade Finish.
 - Latex (over latex primer sealer), Gloss/Sheen – G1.

3.7 CLEAN-UP

- .1 Upon completion of the work, remove all paint and varnish spots from floors, glass and other surfaces. Remove from the premises all rubbish and accumulated materials of whatever nature, not caused by others, and leave this work in clean, orderly and acceptable conditions.

END OF SECTION

1.0 GENERAL

1.1 GENERAL REQUIREMENTS

- .1 The General Conditions of the Contract, Supplementary Conditions, and the General Requirements of Division 1, form part of this section, and must be read in conjunction with the requirements of this section. The work of this section shall comply with all requirements of Division 1 – General Requirements.

1.2 SECTION INCLUDES

- .1 Indoor inclined platform wheelchair lifts.

1.3 REFERENCES

- .1 ASME A17.5 - Elevator and Escalator Electrical Equipment.
- .2 ASME A18.1 - Safety Standard for Platform Lifts and Stairway Chairlifts.
- .3 CSA B44.1 - Elevator and Escalator Electrical Equipment.
- .4 CSA B355 - Lifts for Persons with Physical Disabilities.
- .5 ICC/ANSI A117.1 - Accessible and Usable Buildings and Facilities.
- .6 NFPA 70 - National Electric Code.
- .7 CSA - National Electric Code.

1.4 SUBMITTALS

- .1 Make submittals in accordance with Section 01 30 00.
- .2 Product Data: Manufacturer's data sheets on each product to be used, including:
 - .1 Submit manufacturer's installation instructions, including preparation, storage and handling requirements.
 - .2 Include complete description of performance and operating characteristics.
- .3 Shop Drawings:
 - .1 Show typical details of assembly, erection and anchorage.
 - .2 Include wiring diagrams for power, control, and signal systems.
 - .3 Show complete layout and location of equipment, including required clearances.
- .4 Selection Samples: For each finish product specified, two complete sets of color chips representing manufacturer's full range of available colors and patterns.

1.5 QUALITY ASSURANCE

- .1 Manufacturer Qualifications: Firm with minimum 40 years documented experience in manufacturing of inclined wheelchair platform lifts of installations specified.
- .2 Installer Qualifications: Firm licensed to install equipment of this scope, with evidence of experience with specified equipment. Installer shall maintain an adequate stock of replacement parts and have qualified people available to ensure timely maintenance and callback service at the project site.

1.6 REGULATORY REQUIREMENTS

- .1 Provide platform lifts in compliance with:
- .2 CSA B355 - Lifts for Persons with Physical Disabilities.
- .3 CSA B44.1/ASME A17.5 - Elevator and Escalator Electrical Equipment.
- .4 CSA - National Electric Code.

1.7 DELIVERY, STORAGE AND HANDLING

- .1 Store products in manufacturer's unopened packaging until ready for installation.
- .2 Store components off the ground in a dry covered area, protected from adverse weather conditions.

1.8 PROJECT CONDITIONS

- .1 Do not use wheelchair lift for hoisting materials or personnel during construction period.

1.9 WARRANTY

- .1 Warranty: Manufacturer shall warrant the wheelchair lift materials and factory workmanship for two years following completion of installation.
- .2 Extended Warranty: Provide an extended manufacturer's warranty for the entire warranty period covering the wheelchair lift materials and factory workmanship for the following additional extended period beyond the initial warranty. Preventive Maintenance agreement required.
 - .1 Five additional years.

2.0 PRODUCTS

- .1 Acceptable Manufacturer: Garaventa Lift;

2.1 STAIR LIFT FOR STRAIGHT STAIRWAYS

- .1 Garaventa Inclined Platform Lift: Stair-Lift Model XPRESS II to serve one flight of straight stairs, with two landings and two stops. Lift consists of an extruded aluminum guide rail, a folding platform that is moved along the guide rail by an integrated rack and pinion drive system, overspeed safety system and call stations at each landing. Conform to the following design requirements:

- .1 Application:
 - .1 Indoor.

- .2 Platform Load Rating: 250 kg (550 lbs).
- .3 Travel Speed: 4m/min (13 fpm) traveling up; 5 m/min (16 fpm) traveling down.
- .4 Platform Deck: Surface shall be slip resistant with the following features:
 - .1 Platform Size A (ADA Compliant): 800 mm (31 1/2 in.) wide by 1250mm (49 1/4") long
- .5 Platform Operation:
 - .1 Automatic Fold: Folded and unfolded electrically from the call station.
 - .2 Emergency Manual Fold: When unit is left in the open position, the platform may be manually folded and retained in the closed position.
- .6 Under Platform Obstruction Sensing:
 - .1 Provide an under-platform sensing device to stop the platform from traveling in the downward direction when encountering 20N (4 lbf) of pressure.
 - .2 Platform is permitted to travel in the opposite direction of the obstruction to allow clearing.
- .7 Passenger Restraining Arms:
 - .1 Platform equipped with retractable passenger restraining arms in compliance with ASME A18.1a – 2001 or more recent edition.
 - .2 Arms stop moving when an obstruction causing 20 N (4 lbf) of pressure is encountered and will immediately retract when the signal is removed.
 - .3 Provide with means to manually unlock and open the restraining arms for passenger emergency evacuation.
 - .4 Arms are folded and unfolded electrically from the call stations or platform controls.
 - .5 Top of arms mounted 800 mm (32 in.) to 1000 mm (38 in.) above the platform deck. When in the guarding position the arms are located above the perimeter of the platform.
 - .6 The gaps between the ends of the arms shall not exceed 100 mm (4 in.).
- .8 Boarding Ramps:
 - 1 Provide boarding sides of platform with retractable ramps positioned for travel at a height of 150 mm (6 in.) measured vertically above the platform deck.
 - .2 Lock ramps in their guarding positions during travel. When the platform is at the landing, only the retractable ramp servicing the landing shall be operable.
 - .3 Ramps shall be folded and unfolded electrically.
 - .4 Retractable ramps, in the guarded position, shall withstand a force of 550 N (125 lbf) applied on any 100 mm (4 in.) by 100 mm (4 in.) area. This force shall not cause the height of the ramp, at any point in its length, to be less than 150 mm (6 in.) measured vertically above the platform deck.
 - .5 Provide a means to manually unlock the ramps for emergency evacuation when the platform is located at a landing.
 - .6 Provide with a bi-directional obstruction sensitive device on the travel direction end of the platform to stop the lift when 20 N (4 lbf) of pressure is encountered on either the outside or inside of

- the platform. Platform is permitted to travel in the opposite direction of obstruction to allow clearing.
- .9 Platform Kick Plate:
- .1 Provide on the non-boarding and non-guide rail side of the platform a kick plate of not less 150 mm (6 in.) in height, measured vertically from the platform deck.
- .2 When the platform is folded the kick plate shall cover the platform controls, providing protection from vandalism.
- .10 Hand Grips:
- .1 Equip platform with a 32 mm (1-1/4 in.) tubular steel hand grip or grab bar at the top of the platform. The hand grip is to cover the entire width of the platform.
- .11 Clearances Dimensions:
- .1 The platform shall not protrude more than 260 mm (10 1/4 in.) from the mounting surface when folded and stored.
- .2 The platform shall not protrude more than 1020 mm (40 1/4 in.) from the mounting surface when unfolded and in use.
- .12 Controls:
- .1 Controls: 24 VDC Low Voltage type.
- .2 Platform equipped with emergency stop switch located within reach of the passenger. When activated the emergency stop button shall cause electric power to be removed from the drive system stopping lift immediately.
- .3 Operating controls shall be two separate 36 mm (1 1/2) diameter round continuous pressure buttons with directional arrows, mounted on the front surface of the platform control panel.
- .4 When the platform arrives at landing and the user releases the directional control button, the passenger restraining arms and boarding ramp shall unfold automatically allowing passenger to disembark.
- .5 Platform control panel shall include a receptacle for an optional plug-in hand-held attendant pendant control.
- .6 Platform shall be equipped for:
- .1 Keyed Operation.
Provide control wiring to allow the platform to be folded into the storage position from the opposite call station.
- .13 Passenger Seat: Fold-down type with safety belt.
- .14 Platform Security Lock: Provide to prevent unauthorized unfolding of the platform.
- .15 Attendant Hand-Held Pendant Control: Provide lift with a plug-in pendant control for attendant operation.
- .16 Autofold Platform: Automatically fold platform into storage position when left unused in open position at any landing for:
- .1 3 minutes
- .17 Platform On-Board Emergency Alarm: Provide platform with an on-board alarm that sounds when emergency stop button is pushed. The alarm shall have a battery back-up so that it will continue to function if lift power is lost.

.2 Drive and Guide Rail System:

- .1 Operation:
 - .1 Motor: 0.6 kW (3/4 HP) electric motor with an integrated brake.
 - .2 Required power: 208-240 VAC, single phase, 50/60 Hz. on a dedicated 20-amp circuit. Power Transmission: Worm gear reduction to a pinion moving on a fixed gear rack.
 - .3 A frequency inverter shall be used to smoothly start and stop the platform motion.
 - .4 Drive carriage and associated control devices to be located within the platform conveyance.
 - .5 An upper final limit switch shall be provided to stop the lift in the event of a failure of the primary limit switch.
 - .6 Drive system shall be equipped with an hour counter.
- .2 Guide Rail System:
 - .1 Two-part guide rail system consisting of:
 - .1 Main Upper Rail: Extruded aluminum weighing 11.9 kg/m (8 lb/ft) with integrally mounted zinc plated gear rack.
 - .2 Lower Rail: 38 mm (1 1/2 in.) by 64mm (2 1/2 in.)
 - .2 Rail Mounting:
 - .1 Rails shall be directly mounted to the stairway wall.
 - .3 Provide a mechanical stop at the upper landing to prevent over-travel of the drive carriage in the event of a switch failure.
 - .3 Provide overspeed governor and brake on upper carriage drive, containing mechanical overspeed sensor and lock, with electrical drive cut-out protection.
 - .4 Provide with manual handwheel for emergency operation.
 - .5 Emergency Battery Operation:
 - .1 Auxiliary Power: Provide an external battery back-up system for normal up/down lift operation during a power failure for a minimum period of one hour with rated load.
 - .2 Emergency battery lowering provide an on-board battery system to allow the user to lower the platform during a power failure.

.3 Pedestrian Handrail Integrated with Guide Rail:

- .1 Provide a pedestrian handrail to be mounted to the top of the upper rail.
- .2 The top of the handrail gripping surface shall be between 785 mm (31 in.) and 1270 mm (50 in.) above the stair nosing and have a smooth gripping surface 38 mm (1-1/2 in.) in diameter.
- .3 Handrail will be on the same plane as the upper rail of the lift.

.4 Call Stations:

- .1 Provide surface mounted call stations at both landings.
- .2 Call stations:
 - .1 operating voltage to be 24V (wired) or 9V DC (wireless)
- .3 Call stations shall be provided with continuous pressure directional control buttons for call and send.
- .4 A one-touch control system shall be used to automatically fold/unfold the platform, boarding ramps and passenger restraining arms.
- .5 Call stations shall be equipped for:

- .1 Keyed Operation.
- .6 Provide continuous pressure Attendant Call buttons on each call station.
- .7 Mounting:
 - .1 Lower landing call station:
 - .1 Surface mounted call station.
 - .2 Upper landing call station:
 - .1 Surface mounted call station.
- .5 **Additional Safety or Code Requirements:**
 - .1 Wall Mounted Audio-Visual Alert: Provide wall mounted audio-visual alter(s) with adjustable volume control that sound while the lift is in operation and are visible by pedestrian traffic from all flights and landings.
 - .2 Building Fire Alarm Integration:
Building Fire Alarm System to connect the lift control system with the building fire alarm system. If the lift is not in operation when the building fire alarm system is activated power will be cut to the lift preventing use during fire evacuation. If the lift is in use when the building fire alarm system is activated, the lift shall only allow the passenger to travel to the designated landing with the emergency exit.
- .6 **Finish Environment Requirement:**
Design and fabricate lift to manufacturer's standard design for indoor locations.
 - .1 Guide rails and ramps shall be extruded aluminum. Extruded aluminum and steel components shall be painted with
 - .1 Optional color as selected by Architect from an RAL color chart.
 - .2 Electrical printed circuit boards and control transformers to be treated with a conformal coating for resistance to ambient moisture.

3.0 EXECUTION

3.1 EXAMINATION

- .1 Do not begin installation until substrates have been properly prepared.
- .2 Verify electrical rough-in is at correct location.
- .3 If substrate preparation is the responsibility of another installer, notify Consultant of unsatisfactory preparation before proceeding.

3.2 PREPARATION

- .1 Clean surfaces thoroughly prior to installation.
- .2 Prepare surfaces using the methods recommended by the manufacturer for achieving the best result for the substrate under the project conditions.

3.3 INSTALLATION

- .1 Install platform lifts in accordance with and in compliance with regulatory requirements specified and the manufacturer's instructions.
- .2 Install system components and connect to building utilities.
- .3 Accommodate equipment in space indicated.
- .4 Startup equipment in accordance with manufacturer's instructions.
- .5 Adjust for smooth operation.

3.4 FIELD QUALITY CONTROL

- .1 Perform tests in compliance with regulatory requirements specified and as required by authorities having jurisdiction.
- .2 Schedule tests with agencies and Architect, Owner, and Contractor present.

3.5 PROTECTION

- .1 Protect installed products until completion of project.
- .2 Touch-up, repair or replace damaged products before Substantial Completion.

END OF SECTION

CONTENTS

<u>SECTION</u>	<u>TITLE</u>
26 05 00	Common Work Results for Electrical
26 05 01	Basic Materials & Methods
Division 27	Communication Requirements – V1.8 (TDSB Standard Communications Specifications)
END OF SECTION	

1.1 REFERENCES

- .1 Division 1, General Requirements, is a part of this Section and shall apply as if repeated here.

1.2 APPLICATION

- .1 This Section applies to and is a part of all Sections of the Electrical Contractor.

1.3 WORK INCLUDED

- .1 Sections of these Electrical Specifications are not intended to delegate functions nor to delegate work and supply to any specific trade and the work shall include all labour, materials, equipment and tools required for a complete and working installation as described.

1.4 INTENT

- .1 Mention herein or indication on drawings of articles, materials, operations or methods requires: supply of each item mentioned or indicated, of quality, or subject to qualifications noted; installation according to conditions stated and; performance of each operation prescribed with furnishing of necessary labour, equipment and incidentals for Electrical Trade, The Electrical Contractor.
- .2 Supplementary to definitions established are:
 - 1. “Concealed” means hidden from normal sign in furred spaces, shafts, ceiling spaces, walls, or partitions. Wiring, raceways, and electrical boxes for all new or relocated devices shall be concealed.
 - 2. “Exposed” means work normally visible, including work in equipment rooms, tunnels, and similar spaces.
 - 3. “Provide” (and all tenses) means supply and install for a complete, operational, and code-compliant system, including all devices/equipment as specified complete with wiring, raceways, electrical boxes, and all other accessories or components required for a complete, operational, and code-compliant installation.
 - 4. “Install” (and all tenses) means secure in position, connect as specified, test, and verify.
 - 5. “Supply” means to supply all devices/equipment to the responsible trade.
 - 6. “Remove” means to isolate, disconnect, disassemble, remove, and dispose of all devices, equipment, wiring, raceways, and connections to other equipment. Patch and make good all surfaces affected by the removal. Remove and dispose of all redundant material off site

- .3 Where used, wordings such as "approved, to approval, as directed, permitted, permission, accepted, acceptance", shall mean: approved, directed, permitted, accepted, by authorized representative of the Owner.

- .4 Equipment and installation provided under this Division shall conform to applicable standards and regulations of the following organizations:

Canadian Standards Association (CSA)
Underwriter's Laboratories of Canada (ULC)
Ontario Electrical Safety Code (OESC)
Electrical Safety Authority (ESA)
Ontario Building Code (OBC)

1.5 WORKMANSHIP

- .1 Workmanship and method of installation shall conform to best standards and practice. Where required by local or other By-Laws and Regulations, tradesmen shall be licensed in their trade.

1.6 TEMPORARY & TRIAL USAGE

- .1 Temporary or trial usage of any equipment or materials shall not be construed as evidence of acceptance of same and no claim for damage shall be made for injury to or breaking of any part of such work which may be so used..

1.7 BY-LAWS & REGULATIONS

- .1 Work shall conform with latest rules, regulations and definitions of Canadian Electrical Code and applicable Municipal and Provincial Codes and Regulations, and with requirements of other authorities having jurisdiction in the area where work is to be performed. Minor changes required by an authority having jurisdiction shall be carried out without change to the Contract amount. Standards established by drawings and specifications shall not be reduced by applicable codes or regulations.

1.8 PERMITS & FEES

- .1 File Contract Drawings with proper authorities and obtain their approval of installation and permits for same before proceeding with work. Prepare and submit necessary detailed shop drawings as required by Authorities.
- .2 Pay all fees in connection with examination of drawings, permits, inspections and final certificate of approval.
- .3 All ESA Costs shall be included in the Electrical Contractor's Base Tender Price.

1.9 CERTIFICATES

- .1 Furnish necessary certificates as evidence that work installed conforms with laws and

regulations of authorities having jurisdiction.

1.10 GUARANTEE - WARRANTY

- .1 All material and labour provided as a part of the project shall be warrantied for a period of twelve (12) months starting from the Date of Substantial Completion for the Project, except for Fire Alarm Work which shall be warrantied for eighteen (18) months starting from the Date of Substantial Completion for the Project

1.11 SPECIFICATIONS, DRAWINGS & JOB CONDITIONS

- .1 Electrical Drawings do not show structural and related details. Take information involving accurate measurement of building from building drawings, or at building. Make, without additional charge, any necessary changes or additions to electrical work or equipment locations to accommodate structural conditions. Equipment locations may be altered by Engineer without extra charge provided change is made before installation and does not necessitate major additional material.
- .2 Examine site and local conditions. Examine carefully all drawings and complete specifications to ensure that work can be satisfactorily carried out as shown. Before commencing work, examine the work of other Sections and report at once any defect or interference affecting the work, its completion or warranty. No allowance will be made later for any expense incurred through failure to make these examinations or to report any such discrepancies in writing.
- .3 Relocate equipment and/or material installed but not coordinated with work of other Sections as directed, without extra charge.
- .4 Furnish "built-in" items in ample time and give necessary information and assistance in connection with building-in of same. Notify Section concerned in writing of size and location of recesses, openings and chases at least 48 hours before walls are erected, floors poured and similar work.

1.12 TENDER & SUBSTITUTIONS

- .1 The Base Tender Price shall be submitted based on the Base Specified Manufacturer as listed on the Drawings and/or Specifications. Any manufacturers listed as "equal" or "equivalent" may be proposed as an alternate to the Base Specified Manufacturer prior to Contract Execution with written approval only by the Consultant and Owner. Any changes to the Manufacturer of any materials/labour after execution of the Project Contract is not permitted.

1.13 INTERFERENCE DRAWINGS

- .1 Prepare and submit complete interference drawings (in PDF format) to avoid and/or resolve conflict of trades and to coordinate the work of the Electrical Division with that of all other Trades. Submission of interference drawings shall be done no later than 20 business days after the Project has officially begun. The cost of producing the

interference drawings shall be included for in the Base Tender Price.

- .2 Interference drawings shall indicate exact arrangements, of all areas and equipment to scale with dimensions.
- .3 Cooperate with work of the Mechanical Contractor and provide data requested and as required in the preparation of interference drawings for the work of The Mechanical Contractor.
- .4 Make interference drawings in conjunction with all parties and trades concerned showing sleeves and openings and passage of electrical work through building structure. Drawings shall also show inserts, special hangers and other features to indicate routing through confined spaces, installation of equipment in such areas.
- .5 Provide detail drawings, fully dimensioned, of equipment in Boiler and Mechanical Equipment Rooms, Electrical Rooms, Fan Rooms, etc. Base equipment drawings on approved Shop Drawings and include, but do not necessarily limit to, details pertaining to access, clearances, sleeves, connections, etc.
- .6 Provide detail drawings of pulling pits, equipment bases, anchors, floor and roof curbs, etc., pertaining to Electrical work.

1.14 SHOP DRAWING MATERIAL & LISTS

- .1 Prepare and submit shop drawings and lists of materials for review in accordance with Architectural Sections. Make submittals of more than two pages in booklet form. Individual and loose drawings will not be accepted for review.
- .2 Prior to equipment fabrication, delivery or installation, submit complete lists of materials proposed, indicating manufacturer, catalogue numbers and complete performance data.
- .3 Review of Shop Drawings by Consultant is for sole purpose of ascertaining conformance with general design concept. This review shall not mean that Architect and/or Engineer approves detail design inherent in Shop Drawings, responsibility for which shall remain with Contractor and such review shall not relieve Contractor of his responsibility for meeting all requirements of Contract Documents. Contractor is responsible for dimensions to be confirmed and correlated at site, for information that pertains solely to fabrication processes or to techniques of construction and installation and for co-ordination of work with all trades.
- .4 Shop drawings transmitted via facsimile (fax) machines, or copies of same, will not be accepted for review.

1.15 RECORD DOCUMENTS

- .1 Conform to General Requirements. Maintain at least two (2) sets of documents and clearly mark in RED on same as job progresses, changes and deviations from work shown so that on completion Owner will have records of exact location of ducts and

equipment and record of material and equipment changes.

- .2 Record all homerun conduits, junction boxes for complete lighting, power and systems on As-Built Drawings.
- .3 Contractor shall obtain clean set of prints from Consultant at start of Contract Work and shall keep these prints up-to-date at jobsite, accurately recording all changes made on project and locating all services, equipment, etc. which may have been shown only diagrammatically on Contract Documents.
- .4 Contractor shall ensure that as-built information is accurately recorded and shall check same. As-Built drawings shall be reviewed with Consultant at each jobsite meeting.
- .5 Upon completion of Contract Work, prior to Substantial Performance inspection and after final review with Consultants, Contractor shall neatly transfer recorded information and make final As-Built submission to Consultant in the following form:
 - One (1) set of clean, legible prints.
 - Updated AutoCad 2004 drawings. The cost of transferring all redline markups from the PDFs to the CAD files is the responsibility and cost of the Contractor.
- .6 Consultants shall be responsible for reviewing As-Built information provided by Contractor. Revise drawings to suit any comments until acceptable for submission to the Owner.
- .7 The Contractor is responsible for incorporating all information from Project Addenda, Contemplated Changes Notices, Site Instructions, Change Directives and as-found existing conditions into CAD format at no extra cost to the Contract.

1.16 JOB SITE WORK SHOP AND STORAGE

- .1 Supply job site office, workshop, tools, scaffolds and material storage as required to complete the work of this Division. Location of temporary buildings, use of space on site or within building shall be to later direction.

1.17 PROTECTION

- .1 Securely plug or cap open ends of electrical raceways or equipment to prevent entry of dirt, dust, debris, water, snow or ice. Clean all equipment inside and outside before testing.
- .2 Equipment stored on site shall be protected from weather and kept dry and clean at all times. Take care to avoid corrosion of metal parts.
- .3 Protect work installed from damage. Secure all unfinished or loose work to prevent movement.

1.18 INSTRUCTIONS TO OPERATOR

- .1 Instruct Building Operators in repair, maintenance and operation of Electrical Systems and associated equipment.
- .2 Supply three (3) full Operation and Maintenance Instructions each in stiff cover, three-ring binder suitably indexed, separated and labeled. Operate each item of equipment in presence of Operators to ensure understanding of working parts and function of each item of equipment. Supply one complete set of "Reviewed" Shop Drawings in separate hard cover binder suitably separated and labelled for Owner's use.
- .3 Operation and maintenance manuals shall be carefully prepared in co-operation with equipment manufacturers and include miscellaneous parts necessary for proper, efficient operation of all equipment.
- .4 Manuals shall also include spare parts list for each type of equipment, component, control and device installed together with manufacturer's name and address so such items can be suitably identified and purchased. Include list of recommended spares.

1.19 CLEANING, LUBRICATION AND ADJUSTMENT

- .1 Immediately prior to completion of work:
 1. Remove all dust, dirt and other foreign matter from internal surfaces of enclosed electrical apparatus and equipment.
 2. Remove all temporary protective coverings and coatings, temporary labels.
 3. Clean, repair, lubricate and adjust all mechanism and moveable parts of apparatus and equipment leaving it in new condition and operating properly.
 4. Balance demand loads for service and distribution feeders within 5 percent upon completion of work and after the building is in full operation.

1.20 INSPECTION AND TESTING

- .1 Systems, equipment, and all major items of material shall be tested to the satisfaction of the Architect, and as required to establish compliance with plans and specifications, and with the requirements for the Supply and Inspection Authorities.
- .2 Faulty and defective equipment shall be replaced with new materials. Conductors which are found to be shorted or grounded, or to have less than proper insulation resistance, shall be replaced with new conductors.
- .3 Tests shall include but are not limited to the following:
 1. Test of secondary voltage cables shall include megger tests to establish proper insulation resistance, and phase-to-ground resistance of cables.

2. Proper functioning of all systems.
3. Polarity tests - to establish proper polarity connections to all sockets and receptacles.
4. Test of system neutral to establish proper insulation resistance and isolation of neutral from ground except for required ground connection at Service.

1.21 CERTIFICATE OF TESTS

- .1 When work is complete submit three copies of test results and a signed statement listing all tests that have been performed as required by specifications and manufacturer's instructions.

1.22 COMPLETION

- .1 Provide receipts from designated representative of Owner for portable and loose materials (e.g. spare fuses, fixture re-lamping equipment and the like).
- .2 Provide copy of final inspection certificate from Electrical Inspection Authority and fire alarm verification report.
- .3 Provide manufacturers corrected "as built" shop drawings for all major electrical items and systems, including all shop drawings returned for modifications.

1.23 ALTERATIONS TO EXISTING BUILDING

- .1 Note that certain alterations and structural changes are to be made to existing building. Architectural drawings and site are to be examined to determine extent of alterations affecting existing electrical systems. Where existing conduits and wires run through areas to be altered, to feed other parts of existing building, they shall be re-routed and reconnected to maintain their original function. Drawings do not necessarily indicate outlets, switches, receptacles, and the like, and other electrical equipment which are required to be relocated or abandoned. Provide decorative blank cover plates for obsolete outlet boxes remaining.
- .2 Electrical services and auxiliary services (fire alarm, P.A. intercom, and the like) shall be maintained continuously without interruption. Interruptions to services shall be confined to periods of time to be designated by Architect, and/or Owner's designated representative. Include in tender for temporary connections, overtime labour charges, and such related allowances in order to conform with these conditions.
- .3 The Electrical Contractor is responsible for removal, reinstallation, cutting and patching of ceiling and walls as required in the existing building.
- .4 Cutting directly related to electrical work, regardless of whether such work occurs in new or existing construction, shall be coordinated and paid for by Electrical Subcontractor involved, under supervision of Contractor.

- .5 Where existing electrical items or systems are demolished and removed from existing construction assemblies, Electrical Subcontractor involved shall be responsible for infilling entire hole left after removal of item or system with new construction assembly to match existing. Where new electrical items or systems are installed through existing construction assemblies, Electrical Subcontractor involved shall be responsible for properly sized and accurate cutting of existing construction assembly to allow installation of new work.
- .6 Include all efforts for the tracing and verifying of all branch circuits and panels as required to complete the scope of work proposed on the drawings.

1.24 PROJECT SPECIFIC NOTES

1. Obtain all approvals from public Authorities Having Jurisdiction prior to commencing any work. Include, in the tender price, for all ESA permit and inspection fees. Arrange for and attend all inspections required as per requirements of the Electrical Safety Authority, the Building Department and any other Authorities Having Jurisdiction; attendance for all Inspections shall extend to all Sub-Trades of the Electrical Contractor and Supplier/Manufacturers.
2. Examine Architectural Drawings and Specifications and all Contract Documents before proceeding with the work. Any discrepancies between the drawings and specifications of all disciplines must be referred to the architect before any affected work is commenced.
3. The Electrical Contractor shall furnish all labour, material, tools, equipment, etc. required to complete all work shown on the drawings and/or complete all work specified in the contract documents. The work shall be performed in accordance with rules and regulations of all Authorities Having Jurisdiction over the work. This Contractor shall provide any small items of work not specifically called for but required to complete the intended installation and/or required to achieve the desired intent or functional utility.
4. Perform all work in full accordance with the Ontario Building Code, Ontario Electrical Safety Code, TDSB standards and good practices and the requirements of all other Authorities Having Jurisdiction. All work performed by this division shall be done in accordance with all Manufacturers' recommendations. Obtain all available manufacturer's recommendations and comply.
5. All cutting, patching, coring, scanning, x-raying, making good and fire stopping required for the work of this division shall be carried out by this division. The Electrical Contractor is responsible for and shall pay for any and all damage to the building and/or surrounding area incurred by work of this division.
6. Review the Designated Substances Survey provided by the Owner in detail prior to commencing any work. All abatement work necessary for this project shall be included for in the Base Tender Price.
7. The Electrical Contractor must review and submit shop drawings for all materials to be supplied as a part of the Contract in conjunction with the General Contractor to the

Architect and Electrical Consultant prior to ordering. Order only upon receipt of approval. Order, supply and install as per all comments. The Shop Drawings must be reviewed and ensured for compliance with the Contract Documents by the Electrical Contractor and General Contractor prior to submission; confirmation of review and confirmation that the submittal is in compliance with the Contract Documents is the responsibility of the Electrical Contractor and General Contractor to include in writing with each Shop Drawing Submittal. Any non-conformance of the Submittal with the Contract Documents identified by the Electrical Consultant will require a resubmission of the Shop Drawing Submittal by the Electrical Contractor prior to review. The Electrical Contractor shall bear all costs of any review by the Electrical Consultant beyond the Original Shop Drawing Submission at a cost of \$250.00 CAD + HST per resubmission.

8. All materials used throughout shall be new, of best quality, C.S.A. approved, and of one manufacturer. Wherever trade names are not used to describe materials, these materials shall be of the best available quality. Obtain and pay for special ESA inspections of specified non-C.S.A. electrical equipment.
9. Provide all wiring, raceways, electrical boxes, and such components as required for a complete and operational installation.
10. All conduit shall be rigid steel or EMT with gland watertight connectors and compression type couplings, unless otherwise noted. Exposed raceways in finished areas shall be wiremold channels installed neatly in appearance, run parallel to building lines, and concentric right angle bends only shall be used. Exterior exposed conduit shall be rigid galvanized steel. Supply and install access doors as necessary due to the proposed work. All access panel ratings shall match that of the surface in which it is being installed.
11. All access panels ratings shall match that of the surface in which it is being installed. All access panels requiring supply/install as a part of the project work shall be included for in the Base Tender Price.
12. All wiring shall be of minimum #12 gauge copper, except as otherwise noted or as required based on the intended use of the device/equipment. All wiring shall be 600 Volt Type RW90. All wiring shall be run in conduit from the source to the load. BX cable may be used where permitted by code in ceiling space for final connections only and for a maximum length of 5'. Maximum voltage drop shall not exceed 2 percent.
13. Coordinate with all other trades present on site throughout the full course of construction. Lay out of all work so as not to conflict with the work of other trades. Carry out work promptly which may interfere with the work and/or schedule of any other trades.
14. After completion of the work, provide the consultant with a set of 'as-built' record drawings in pdf format prior to submission to the owner. Incorporate all changes in the pdf drawings.
15. Alterations and additions: contractors shall note that this contract is an alteration to an existing building and as such the contractor shall thoroughly investigate the existing electrical installation and electrical, mechanical, structural, and architectural conditions

prior to pricing and construction.

16. Demolition: remove all exposed conduits, branch wiring, outlets, etc. from surfaces being demolished.
17. Cleanup and garbage: the Contractor is responsible for maintaining as clean of a work area as possible during construction. The contractor is responsible to clean-up and remove tools from the site at the end of every working day. Disposal of all redundant materials, devices, and equipment is the responsibility of the contractor on a daily basis.
18. All work shall be done with minimum possible interruption to the existing Building systems and in the time schedule permitted by the Owner. Any work involving shut down of power or fire alarm coverage to parts of the Building or the entire Building shall be completed during weekend hours only. Provide labour accordingly and include for all premium costs associated with Weekend Labour in the Tender Price. Any shutdown exceeding two (2) hours shall require the Electrical Contractor to provide a backup diesel-fired generator and backing up select Life Safety and Essential Loads of the building for the duration of the shutdown. Include all costs of the temporary generator in the Base Tender Price. Coordinate timing of the shutdown with the Project Manager a minimum of five (5) business days in advance of the scheduled shutdown.
19. Paint all exposed conduit and backboxes, inside and outside of the building, to match the surrounding wall/ceiling colour. Minimize exterior conduit run where feasible.
20. All backboxes installed indoors shall be Wiremold. All backboxes installed outside shall be of cast aluminum finish.
21. For all panels where new circuits are added, provide a new typed panel directory based on the new loads. Incorporate all existing circuit information from the existing panel directory on site in the new panel directory.
22. Unless otherwise explicitly stated in writing in the Contract Documents, all materials, labour, scope and descriptions of work described in the Contract Documents is the responsibility of the Electrical Contractor to supply and install as a part of the Base Tender Price. No materials and/or labour is to be completed under the Project Allowances unless explicitly noted as such in the Contract Documents.
23. All new raceways and wiring installed shall be:
 - a. Concealed in new partitions.
 - b. Concealed above existing drop ceilings where present.
 - c. Concealed above new drop ceilings where present.
 - d. No exposed run of raceway/wiring will be permitted whatsoever in the new construction area.
 - e. Where the existing walls are block, all exposed raceways shall be Wiremold unless approved in writing by the Owner.
 - f. Where the existing walls are drywall, cut/patch/make good wall and conceal all raceways and backboxes.
 - g. In the new Universal Washroom, all raceways shall be concealed in the wall,

regardless of whether the wall is existing or not. Cut/patch/make good the block wall to conceal the conduit in the block wall.

24. All demolition and new work shall be completed in strict accordance with the Contract Documents with no deviations unless instructed by the Electrical Consultant in writing prior to execution of the work. The Electrical Consultant is not responsible, nor required, to accept any work (regardless of its compliance with code) not completed in accordance with the Contract Documents. The Electrical Contractor will be responsible, at his/her cost, of furnishing a Sealed Letter from a Professional Engineer licensed in the Province of Ontario to accept and assume responsibility for all work not completed in accordance with the Contract Documents. The cost of obtaining this letter and the retaining of the Engineer, including all associated inspection charges, is the sole responsibility of the Contractor.
25. Unless otherwise noted, all devices, equipment, material, supplies, etc. shown on the drawings or otherwise required for a fully operational system as described/illustrated on the Drawings shall be supplied and installed under this Project. It shall not be assumed that any of the devices, equipment, material, supplies, etc. shown on the Drawings are to be provided (in part or in whole) by any other Party.
26. Leave two (2) full sets of As-Built Drawings in full size (36"x48") on site at the conclusion of the project; handover to the Caretaker.
27. Panel directories shall include room numbers and names to identify the location of the device/equipment; obtain the finalized room numbering from the Architect at the time of preparation.
28. Run all raceways/wiring concealed above drop ceilings. Where there is an accessible drop ceiling, raceways shall be run in the accessible drop ceiling.
29. For all new circuits proposed on the Drawings, provide new breakers suitable for the respective power source. The Contractor is responsible for running new conduit into the panelboard as the existing conduits may not have space to accommodate new wiring. Allow for the necessary cutting, patching and making good of the existing wall to achieve this.

1.25 CLOSEOUT DOCUMENTS

- .1 Coordinate with the General Contractor to submit a comprehensive Closeout Document Package incorporating documents from all trades in one consolidated package. Closeout Documents shall consist of one (1) 3-ring binder hard copy and 3 USBs/CDs. The Electrical Section of the Closeout Documents shall consist of the following:
 - (a) Electrical Contractor Warranty Letter, signed and dated. Warranty shall be for a period of twelve (12) months starting on the Date of Substantial Completion, except for the Fire Alarm System Work which shall be for a period of eighteen (18) months starting on the Date of Substantial Completion.
 - (b) Project Shop Drawings, in consecutive order of the Consultant's number scheme.
 - (c) O&M Manuals for all equipment supplied on the project.

- (d) ESA Inspection & 'Final' Certificates.
- (e) Red-Line As-Builts (by the Electrical Contractor) and CAD As-Builts (completed by the Electrical Contractor in 2004 Format).
- (f) Emergency Lighting Letter, signed and dated, stating "The emergency lighting for the project has been supplied and installed in strict accordance with the Drawings, Specifications, Contract Documents, Code Requirements, Manufacturer's Recommendations and the requirement of all Authorities having Jurisdiction. The emergency lighting system as a whole has been tested and confirmed to be in continuous operation for a consecutive period of thirty minutes or more. All emergency lighting has been tested on site and confirmed to provide illumination as per OBC requirements with no deficiencies."
- (g) Fire Alarm Installation Letter, signed and dated, stating "The fire alarm system for the project has been supplied and installed in strict accordance with the Drawings, Specifications, Contract Documents, Code Requirements, Manufacturer's Recommendations and the requirement of all Authorities having Jurisdiction. All new devices and equipment have been supplied and installed in accordance with CAN/ULC-S524 and verified as per CAN/ULC-S537."
- (h) Emergency Lighting Illumination Testing results.
- (i) Emergency Lighting Voltage Drop Test.
- (j) Fire Alarm Verification Report.
- (k) Lighting Control Commissioning Report, by the Lighting Controls Manufacturer.
- (l) Short Circuit Calculation, Coordination and Arc Flash Study Report.
- (m) Integrated Systems Testing Certification, Plan and Final Report.
- (n) Data Cabling Testing Report.
- (o) ULC Monitoring Certificate.
- (p) Firestopping Inspection Report.

1.26 TRAINING & DEMONSTRATION

- .1 At the completion of the project, provide a complete training and walkthrough of all new and/or replaced electrical systems provided as part of the project. Participants of the training and walkthrough will be established by the Owner. Responsibilities including the following:
 - (a) Demonstrate to the appointed Staff the intent of all new devices, equipment and system and how to operate them and maintain them in accordance with the Manufacturer's Requirements.
 - (b) Provide end-to-end training on how to use the new devices, equipment and systems installed for the School's day-to-day operations.

1.27 PROJECT PROGRESS THROUGHOUT CONSTRUCTION

- .1 The Electrical Contractor is responsible for taking photos of all existing conditions and mechanical systems on site being affected by the Project at the onset of construction. All photos shall be date stamped.
- .2 The Electrical Contractor is responsible for taking photos of the project's progress throughout the construction site every two weeks. All progress photos shall be shared and sent electronically to the Electrical Consultant on the 15th and 30th of every month. Photos

are meant to illustrate the progress of the project and correction of any deficiencies identified in routine site reviews and review of progress photos.

- .3 The Electrical Consultant will, from time-to-time, visit the Project Site and issue a Field Review Report. The Electrical Contractor is obligated to rectify any deficiency identified within 7 working days of receipt of the Report. The Electrical Contractor is responsible for signing the Field Review Report upon 72 hours of the report being sent to the General Contractor, acknowledging receipt of the report. The Electrical Contractor must take photos of all remedial work within 7 working days of receipt of the Report and distribute to the Consultant.

END OF SECTION

PART 1 - GENERAL

1.1 REFERENCES

- .1 Conform to Section 26 05 00 Common Work Results for Electrical.

1.2 MATERIALS

- .1 Materials shall be new, of Canadian manufacture where available, first quality and uniform throughout. Submit tender based on the use of materials and equipment specified, or on the listed acceptable alternate equipment as further detailed.
- .2 Electrical materials shall be C.S.A. approved and be so labeled. Material not C.S.A. approved shall receive acceptance for installation by Electrical Safety Authority (ESA) Special Inspections Branch before delivery, and modifications and charges required for such acceptance shall be included in work of this Section. Material shall not be installed or connected to the source of electrical power until approval is obtained.
- .3 Confirm capacity, ratings and characteristics of equipment items being provided to supply power to equipment provided under other Sections of the work. Resolve discrepancies before such items are purchased.

1.3 MATERIAL ACCEPTANCE

- .1 Acceptance of materials installed presumes that materials have not been damaged or exposed to conditions that would adversely affect performance and life expectancy.
- .2 If in the opinion of the Consultant, materials have sustained damage, or have been exposed to abnormal conditions it shall be the responsibility of the Contractor to have such tests performed as deemed necessary by the Consultant to establish condition and therefore, acceptability of installed materials.

PART 2 - PRODUCTS

2.1 RACEWAYS

- .1 Rigid galvanized steel conduit shall comply with CSA Specification C22.2 No. 45.
- .2 Electrical metallic tubing (EMT) may be used in place of rigid conduit in dry locations subject to governing regulations, embedded in masonry walls, and concealed above suspended ceilings. Connectors shall be of gland watertight EMT type with factory-installed insulated throats and provide compression type EMT couplings (cast fittings/set-screws are not acceptable) to be forged steel.
- .3 Rigid PVC conduit shall comply with CSA Specification C22.2 No. 136.
- .4 Watertight flexible conduit: "Sealtite" PVC jacketed flexible steel with Hubbell-Kellum strain relief grips; shall comply with CSA Standard C22.2 No. 56.

- .5 Surface wall-mounted raceways shall be Wiremold No. 4000 metallic type complete with two channels and all necessary fittings, closers, device modules, etc. Wiremold or approved equal only.

2.2 WIRE & CABLE

- .1 Branch wire and cable shall comprise copper conductors, sized as noted, rated 75 deg. C., 600 volt minimum flame retardant insulation, and CSA approved for application.
- .2 Wire and cable installed in conduit shall be PVC insulated Type TWH - Flame retardant and comply with CSA Specification C22.2 No. 75.
- .3 Use Electrovert "Z-Type" code markers for control & communication conductors.
- 4. All branch wiring shall be RW90.
- 5 All feeder cables shall be XLPE RW90.
- 6. All underground feeders and branch circuits run from and to outdoor environment shall be XLPE RWU90.

2.3 DEVICES

- .1 Wiring devices unless otherwise specified herein, or noted, shall be as manufactured by Hubbell, Leviton or Pass & Seymour.
- .2 Light Switches for shall be of low-voltage type as scheduled on the Drawings.
- .3 Occupancy sensors shall be of low-voltage type as scheduled on the Drawings.
- .4 Key-operated switches shall be of low-voltage type as scheduled on the Drawings.
- .5 Standard 15 Ampere, 120 volt duplex receptacles generally shall be specification grade Hubbell, White, CSA #5-15R and tamperproof type throughout the Area of Work.
- .6 Special purpose receptacles as noted on the drawings shall be Hubbell Conforming to CSA configurations (Table 46 and Table 47 of Canadian Electrical Code) for non-locking and locking receptacles. Provide attachment cap for each special purpose receptacle.
- .7 "Range" receptacles shall be CSA Type 14-50R, 50 amp. 3 pole, 4 wire, grounding 125/250V flush receptacle. Provide the above with 5 foot rubber cord set, 50 amp. and connect equipment.
- .8 Receptacles with integral ground fault interrupter shall be Hubbell No. GF-5252 or approved equal.
- .9 Service receptacle shall be Hubbell No. 5262-RD.

- .10 Clock receptacle shall have recessed fitting. Leviton No. 5261/CH. Mount as per the Modular Control Panel detail.

2.4 DEVICES - SPECIALIZED

- .1 Flush floor boxes shall be Hubbell Cat. No. 3SFB-SSC 3-service box complete with devices shown on drawings.
- .2 Provide low-voltage lighting control, as detailed.

2.5 DEVICE COVER PLATES

- .1 Switch and receptacle and other device faceplates for flush mounted devices, generally shall be single or multi-gang as required, type 301, stainless steel, #4 brushed finish with removable protective covering.
- .2 Weatherproof enclosures for outdoor receptacles shall be P&S 4600 with 4600-26 Mounting Plate, duplex ground fault receptacles and two #4609 Keys.
- .3 Cover plates for other devices such as flush fan controls, telephone, etc., shall be stainless steel to match above.

2.6 PANELBOARDS

- .1 See Section 26 05 20 for details.

2.7 SWITCHES

- .1 Provide fusible and non-fusible switches, NEMA Type 'HD' with quick-make, quick-break contacts, horsepower-rated where required, to match the motor protected. Provide holders to accept specified fuses. Switches to include mechanical cover interlocks and line side barriers.
- .2 Where applicable and available, switches shall be CSA "Approved For High Service Factor".
- .3 Provide safety disconnect switches adjacent to motors and other equipment when required by regulations.

2.8 FUSES

- .1 Provide fuse holders in fusible equipment with a complete set of proper size Form 1, HRC Nema J or L current limiting fuses. Fusible equipment so provided shall be adapted to reject CSA Standard C22.2 No. 59 fuses. Fuses shall be Federal Pioneer - "Econolim".
- .2 Provide one complete set of spare fuses for each rating and type used, unless otherwise scheduled.

- .3 Apply Thomas & Betts "Kopr/Shield" conductive anti-seize compound to all fuse ferrules and holders.

2.9 PUBLIC ADDRESS SPEAKERS

- .1 Procure all Public Address Speakers from Baldwin Sound Systems (Toronto). No alternate supplier for Public Address components will be permitted.
- .2 Site verify the existing public address speaker operating voltage and order new speakers to match.
- .3 Speakers shall be McBride 8229/25/7025 – Pre-assembled ceiling speaker (includes 8” dual cone speaker with 6 oz. magnet, 12-1/2” square steel baffle and 70/25 dual voltage 5 watt transformer). Speaker shall be supplied with SMC20E finished surface-mounted backbox.

PART 3 - EXECUTION

3.1 EQUIPMENT LOCATIONS

- .1 Approximate locations of electrical equipment, fixtures switches, outlets, and the like, are given on the drawings. Refer to the architectural drawings and room elevations for application. In absence of definite detail exact location of outlets shall be determined on site as work progresses.
- .2 Device plates shall cover opening left for outlet box, and plates shall be attached to boxes in an approved manner. Outlets and fixtures are to be located symmetrically, (i.e. centered in wall panels, ceiling panels or tiles, columns, between and above doors and the like).
- .3 The right is reserved to alter the location of equipment and outlets a distance of up to 3 metres without involving a change to the Contract amount, providing notice is given prior to installation.

3.2 MOUNTING HEIGHTS

- .1 Mounting heights of outlets, center of outlet to finished floor, except for exposed masonry construction, shall generally be as follows:
 - Light Switches - 1100 mm
 - Receptacles - 450 mm
 - Television Outlets - 400 mm
 - Data/Telephone Outlets - 400 mm
 - Manual Fire Alarm Stations – 1,150 mm
 - Panelboards – 2,000 mm to top of trim for standard panels.
 - Clocks - 2000 mm or 300 mm below ceiling (except where mounted in a Control Panel).
 - Thermostats – 1,200 mm
 - Fire Alarm Audible Temporal Pattern Horn/Strobes – As per CAN/ULC-S524.

3.3 HOLES & DRILLING

- .1 Pneumatic hammers and percussion drills are prohibited.
- .2 Where not sleeved, make holes through concrete walls and floors by core-drill only. Obtain Architect's approval before drilling.
- .3 Seal holes and sleeves through floors to serve as water dam.

3.4 CUTTING & PATCHING

- .1 Layout and install work in advance of other Sections for all new work. Bear all costs resulting from failing to comply with this requirement.
- .2 Pay for cutting and patching and making good as required for work of this Division by reason of faulty or late work. Employ appropriate trades already engaged on the site to perform such cutting, patching and making good existing walls, floor, ceiling, etc. Before commencing, obtain Architect's approval for extent and nature of cutting. Make good, disturbed surfaces to the Architect's approval.

3.5 EXCAVATION & BACKFILL

- .1 Provide necessary excavating and backfilling inside and outside building required for work of this Division, performed as specified under another Division of the work, except as modified below.
- .2 Keep excavations free from water, pump as necessary.
- .3 Excavation for underground services shall be to required depths and dimension and shall be prepared as required, so that no portion of any conduit, bears directly against any rock or other hard surface.
- .4 Remove and dispose of all surplus excavated material.
- .5 Backfill promptly after approval of work. Prevent damage to or displacement of walls, piping, conduits, waterproofing and other work.
- .6 For direct buried conduit and cable in all soil conditions excavate to 150 mm (6") below and a minimum of 200 mm (8") to either side of the cable run. Fill back with a bedding of sand.
- .7 Backfill trenches within building, with clean sharp sand in individual layers of maximum 150 mm (6") thickness, compacted to a density of 100% Standard Proctor. Hand compact the first layers up to a compacted level of minimum one foot. Hand or machine compact the balance up to grade, using approved equipment.

- .8 Backfill trenches outside buildings with granular 'A' gravel in layers not exceeding 150 mm (6") thickness, compacted to 100% Standard Proctor density up to grade level; manual compaction up to 450 mm (18") and mechanical compaction, using approved equipment, for the balance.
- .9 Make good work where damaged by excavation and filling work of this Division. Repair any subsequent settlement of fill placed under this Division and pay all costs in replacement of other work damaged by such settlement and restoration.

3.6 CONCRETE WORK

- .1 Provide concrete work where required for work of this Division in accordance with applicable requirements specified in Concrete Division 3.
- .2 Provide concrete Lighting Standard Bases, required for the work of this Division. Refer to detail on drawings.
- .3 Provide concrete Duct Banks required for the work of this Division. Refer to detail on drawing for typical construction details.
- .4 Reinforced concrete duct banks shall be keyed into sides of foundation walls. Extend and connect reinforcing steel of duct banks to reinforcing steel of foundation wall construction to prevent failure at the junction of the pipe support and wall.
- .5 Provide 100 mm (4") high housekeeping pads for all floor mounted electrical equipment, such as switchboard, distribution panels and transformer, etc.

3.7 HANGERS & INSERTS

- .1 Provide necessary hangers and inserts for work of this Division.
- .2 Fasten to cast-in place concrete by suitable drilled or cast-in inserts.
- .3 Fasten to structural steel using bolts or welded fasteners.
- .4 Do not use wood, chain, wire lashings, strap or grappler bar hangers except where noted or detailed.
- .5 Support fixtures independently of ceiling suspension systems. Provide additional supports as required, which shall be fastened to building structure steel members, joists, beams, etc., but not metal pan or roof decking. Material for additional supports and their installation shall comply with requirements of U.L.C. Refer to "List of Equipment and Materials" Vol. 2, and "Supplement" for application to rated assemblies.
- .6 Support outlet and junction boxes independently of the conduits running to them where required by electrical code and where deemed necessary by the Architect, use steel angle brackets or steel rods to support outlets and fixtures, to the building structure.

-
- .7 Drilled fastenings to concrete shall be self-drilling concrete anchors, Phillips 'Red-Head' or approved equal. The maximum weight per fastening shall not exceed 25% of manufacturer's 'pull-out' load data.
 - .8 Surface mounted or stem suspended fixtures fastened to non-removable ceilings, 2 hr. fire rated ceiling assemblies, or mounted between metal suspension of exposed T-grid ceilings, shall be provided with minimum of two points of attachment for each 300 mm x 1200 mm (1' x 4') luminaire, using metal 'channel-bar' fastened to building structure. Attach luminaires to 'channel-bar' by means of threaded steel rods. Channel-bar shall be adequately supported and of a construction to prevent deflection under load, as selected from manufacturer's published data, and to Architect's approval. 'Channel-bar' shall be Unistrut, Burndy, Flexibar, Cantrough or Canadian Strut Products or approved equal.
 - .9 Use support clips (e.g. Caddy Type IDS) for suspension of fixtures attached to exposed T-grid ceilings. Clips shall be supported directly from building structure and not from suspended ceiling system.
 - .10 Provide recessed fluorescent fixtures with support frames, and plastering frames where applicable.
 - .11 Chain where permitted and specified for the installation of fluorescent lighting fixtures shall be No. 4, 2 mm (.080") Tenso Pattern coil steel chain, plated with a strength of 82 kg (180 lbs.) as manufactured by Dominion Chain Co. Ltd. or approved equal. Where 'S' hooks are used with chain, they shall be No. 6 type with open strength of 82 kg (180 lbs.) minimum. Attachment of chain at both ends of support shall develop full strength of chain.
 - .12 Support outlet boxes, junction boxes, conduit and the like, mounted on exposed steel deck roofing by means of self-tapping minimum #10 gauge screws, secured through bottom member of deck corrugation. Do not pierce top of steel deck.

3.8 PAINTING

- .1 Hangers, support framing and all equipment fabricated from ferrous metals which are not protected with zinc or other suitable corrosion-resistant finish shall have at least one coat of a corrosion-resistant paint applied before shipment or immediately on arrival at the site.
- .2 After installation, touch up all scratches, chips, other damage and defects in paint, using zinc chromate primer or paint or special enamels as necessary to match the original.
- .3 Finish and colour of all equipment shall be coordinated to provide uniform appearance.
- .4 Painting of conduits and supports and other exposed surface work will be done under Painting Section except as noted. Install materials in time to be painted together with mounting surfaces.
- .5 Do not paint over nameplates.

- .6 Refer to other Sections for special paint finishes of equipment.

3.9 NAMEPLATES & SCHEDULES

- .1 Identify electrical equipment supplied under this Division with 3 mm thick black laminated plastic nameplate to indicate equipment controlled to provide instruction or warning. Fasten each plate with two chrome plated screws. Lettering shall be 6 mm high for small devices such as control stations and at least 13 mm high for all other equipment. Submit a list of proposed nameplates for approval before manufacture.
- .2 Provide panelboards with typewritten schedules identifying outlets and equipment controlled by each branch circuit including existing panels being changed. Protect schedules with non-flammable clear plastic.
- .3 Identify junction boxes, pull boxes, cover plates, conduits and the like, provided for future extension, indicating their function (e.g. power, fire alarm, communication).
- .4 Verify room names and numbers prior to listing on nameplates and schedules.

3.10 BRANCH CIRCUIT WIRING & FEEDER CABLES

- .1 Provide branch circuit wiring, conduits and feeders as required for Lighting, Power and Auxiliary Systems. Separate conduit systems shall be provided for feeder, lighting and power systems, for exit light system and auxiliary communication systems.

3.11 CONDUIT, RACEWAYS AND WIREWAYS

- .1 Wire and cable shall be installed in conduit as follows:
 - Rigid galvanized steel conduit shall be used:
 - .1 Where noted and required by regulations.
 - .2 Where subject to mechanical damage.
 - .3 For all exposed conduit work.
 - .2 Electrical metallic tubing (EMT) may be used in place of rigid conduit in dry locations subject to governing regulations, embedded in masonry walls, and concealed above suspended ceilings. Connectors shall be of gland watertight EMT type with factory-installed insulated throats and provide compression type EMT couplings (cast fittings/set-screws are not acceptable) to be forged steel.
 - .3 Use flexible metallic conduit for connections to chain suspended and recessed fixture drops, motors and similar equipment to prevent transmission of vibration. A code-gauge green grounding conductor shall be provided for all such connections. Use "Sealtite" conduit with Hubbell-Kellum Sealtite conduit strain relief grips for all such connections at motors.
 - .4 Fasten every conduit and cable to structure by means of approved conduit clamps or clips. Wire lashing is not acceptable.

-
- .5 Conceal conduits and wiring except where noted. Run exposed conduits parallel to building lines and to other conduits. Provide every empty conduit with a pull rope (3 mm polypropylene rope) and identify to designate its function (Power, Telephone, Fire Alarm and the like).
 - .6 Where conduit is installed in concrete slabs, obtain general approval, prior to commencing the work, on both maximum dimension and cross-overs which may be used therein.
 - .7 Install conduits in such a manner as to conserve head room and interfere as little as possible with free use of space through which they pass. Obtain approval for routing of same. Keep conduits at least 150 mm clear high temperature work.
 - .8 Conduit installed at the roof level of exposed structures, shall be run tight to roof deck, above purlins and beams.
 - .9 Conduit and cables for electrical work in demountable type and drywall type partitions shall enter from above, from a junction box concealed in the ceiling above and shall comprise a flexible conduit connection.
 - .10 All branch wiring shall be provided with a separate code gauge supplementary grounding conductor run in each conduit or duct, terminating at ground block at panelboards.
 - .11 Run conduit exposed in mechanical equipment rooms, electrical rooms, fan rooms, and the like, and installed after mechanical and other equipment is completed. Install fixtures, outlets, starters, etc., to clear and to suit application.
 - .12 Wiring, boxes, conduit fittings, etc., in hazardous areas shall conform with Ontario Electrical Code, covering explosion-proof areas. Provide conduit seals where required by these regulations.
 - .13 Provide housekeeping curbs around exposed conduits feeding panels, disconnect switches, starters, etc. penetrating floors in front of walls.

3.12 WIRE & CABLE

- .1 Wire and cable shall not be installed at temperatures below 20°C unless "minus 40" type is used. Wiring to heating equipment shall be rated 90°C minimum, the ampacity of which shall be limited to 75°C value.
- .2 Conductors used for all auxiliary systems (e.g. Fire Alarm) shall be tagged and/or colour-coded, and where applicable shall agree with manufacturer's wiring diagrams.
- .3 Minimum wire size for power wiring shall be No. 12 AWG gauge unless specified otherwise. Minimum wire size for "Common" neutral conductors shall be No. 10 AWG. Control wiring shall be #14 AWG red insulation. Maximum voltage drop between furthest outlet of any circuit, when fully energized, and panel to which it is connected shall not exceed two percent except for electric heating circuits which shall not exceed

one percent.

- .4 Cables shall be terminated with moisture-proof connectors, clamped to sheet metal enclosure by a single non-ferrous locknut and grounding bushing.
- .5 Sheaths of multi-conductor cables shall be grounded at both cable ends.
- .6 Sheaths of single conductor cables shall be grounded at supply end only. Provide a Code Gauge Grounding Conductor with each feeder cable run.
- .7 Number of wires indicated for lighting and power, motor and motor control, alarm, signal, communications, and auxiliary systems is intended to show general scheme only. The required number and types of wires shall be installed in accordance with equipment manufacturer's diagrams and requirements, and with requirements of the installation, except that specification standards shall not be reduced.
- .8 Solderless connectors with nylon-jacketted "Vibration-proof" screw-on wire connectors ideal "Wing Nuts", rated 600 volts shall be used for joints in Branch Wiring.
- .9 Use compression joints and terminals for all control wiring; and all conductors #4 AWG and larger. Mechanical connections are acceptable at panelboards and circuit breakers where these are part of factory-assembly.
- .10 Wire or cables in feeders, sub-feeders and branch circuits shall be colour-coded in accordance with Ontario Electrical Safety Code. Each end of feeder terminations (e.g. in Switchboard, Panelboards, switches, splitters and the like) Code Phase A - Red, Phase B - Black, Phase C - Blue, Neutral - White.
- .11 Use C.G.E. Vulkan X-Link insulated cables for circuits protected by ground fault circuit interrupters.
- .12 Include in each conduit, tubing and raceway, a code gauge green supplementary grounding conductor which shall be connected to suitable ground bus in equipment.
- .13 Armoured or sheathed cables may be used only for wiring within demountable and dry wall type partitions and if additionally specified or detailed; however it shall not be directly buried in or below concrete slabs.

3.13 OUTLET, JUNCTION & PULL BOXES

- .1 Use suitable electrical boxes for terminations and junctions on conduit work. Install pull boxes where necessary to permit installation of conductors. Support pull boxes, outlet boxes, panels and other cabinets independently of conduit.
- .2 Provide each light switch, wall receptacle and other device with an outlet box of suitable dimensions and a faceplate. Outlet boxes shall be adapted to their respective locations.
- .3 "Thruwall" and "Utility" type boxes shall not be used.

-
- .4 Electrical boxes and panels shall be CSA approved, code-gauge sheet metal, galvanized or with suitable protective treatment. Secure covers with screws or bolts.
 - .5 Outlet boxes shall not be installed "Back-to-Back" in walls; separate by a minimum of 150 mm.
 - .6 Use "Masonry Type" outlet boxes for flush installation in masonry walls as detailed on standard Detail Drawings attached hereto.) Standard sectional boxes, 1004, 1104 and the like, shall not be used).
 - .7 Install surface mounted devices, in cast conduit fittings, with threaded hubs and suitable stainless steel faceplates.
 - .8 Paint the full length of conduits (installed above accessible and inaccessible ceilings) and main pull and junction boxes (excluding obvious outlet boxes) as per the following colour scheme:

- Lighting	Yellow
- Lighting Controls	Orange
- Power	Blue
- Fire Alarm	Red
- Telephone/Data	Green
- Public Address, Sound and Clock System	Purple

All conduits shall be painted with minimum three (3) coats of paint along the full circumference of the conduit for a clean and consistent finish. Conduits shall be painted prior to installation.

- .9 In addition, each box shall be identified with a system and service designator of logic reference to the service.

3.14 ACCESS DOORS & ACCESS MARKERS

- .1 Supply access doors for installation under the work of other Division where electrical equipment requiring maintenance or adjustment or inspection is located above ceilings, within walls or behind furring; except ceilings of lay-in removable panel type.
- .2 Access doors shall be 12 gauge hinged metal Stelpro Ltd. or equal #722 flush type, minimum size 300 mm x 300 mm (12" x 12") "Reach-in" 300 mm x 600 mm (12" x 24") "Crawl-in", with prime coat finish, concealed hinges, screwdriver lock and plaster key. Access doors in finished masonry or drywall construction shall be #722 less plaster key. Access doors shall be #726 in acoustic tile ceilings; #704 in drywall ceiling and #726E in plaster ceilings.
- .3 Access doors in fire rated ceiling assemblies, all fire rated walls, duct shaft or in corridor walls shall be UL, ULC or WHI listed 1-1/2 hour fire rated access doors equal to LeHage #L1010 or Acudor #150B with screwdriver lock.

- .4 Where lay-in removable panel ceilings requiring hold-down clips are used, access doors are not required but panels shall be secured with accessible hold-down clips and marked with Buildemup #6 RH brass paper fasteners inserted through acoustic panel and bent over. paint heads with blue enamel before installation.
- .5 Obtain approval for sizes and locations.

3.15 PANELBOARDS

- .1 Provide handle locking devices on circuit breakers feeding Plumbing, Heating, Ventilating equipment and controls and all auxiliary systems, time switches, and other devices as noted. Paint handles white, to permanently identify location and function. Provide 30 spare handle locking devices for future use.
- .2 Circuit numbers on drawings do not necessarily correspond to the numbers on the lighting panels. Circuits sharing a common neutral shall not be connected to the same main. Panel circuit breakers which are used directly for the switching of lighting fixtures shall be grouped in consecutive numbers commencing at breaker number one.
- .3 Use "Panduit" lok-strap cable ties for panelboard branch wiring.
- .4 Provide empty conduits from flush panelboards, and others as noted, terminating in accessible ceiling spaces, sized to accommodate spare and space breaker provisions. One 25 mm (1") conduit for each three spare breakers or spaces.
- .5 Provide two (2) 1" empty conduits c/w pull strings to the floor below ceiling space.

3.16 ELECTRIC WORK FOR OTHER DIVISIONS

- .1 Examine Architectural and Mechanical (Plumbing, Heating, Ventilating and Air Conditioning) plans and specifications to determine extent of electrical work in connection with these Divisions which is to be done under the work of the Electrical Division.
- .2 In general, all loose motor starters and associated controls for mechanical equipment will be supplied under Division 26 for installation and connection to both source and load side of the equipment.
- .3 Co-ordinate the exact location and verify characteristics of electrical provisions for the work of the Mechanical Division.
- .4 Coordinate locations of starters, motors and associated equipment with the work of the Mechanical Contractor's Sections to ensure proper location of equipment. The exact locations of conduit terminations at Mechanical units shall be determined from equipment manufactures' approved shop drawings. Conduits must be installed to enter only in the locations designated by equipment manufactures.
- .5 Provide safety switches required for disconnection of remotely controlled motors, and

where required at motors by C.E.C. regulations whether shown on the drawings or not. Where required at fan motors, they shall be concealed in the fan housing if possible.

- .6 Provide for the 120 volt mechanical equipment where noted, all necessary wiring and connections including wiring and installation of starters, thermostats, aquastats, speed controllers and time switches controlling equipment.
- .7 Where motor starters, switches and the like, are grouped together, a suitable 19 mm (3/4") thick plywood panelboard shall be provided to which all such equipment shall be secured. Provide all necessary angle iron supports for support of panelboard and paint entire assembly with two coats of fire retardant type enamel acceptable to Building Inspection Department.
- .8 Provide weatherproof unfused safety disconnect switches, fastened to exterior of roof mounted units, to approval.
- .9 Connect high temperature thermostats "Firestats" provided in ductwork by the Mechanical Contractor, to exhaust fan systems, to provide fan shutdown on activation.

3.17 GROUNDING & BONDING - GENERAL

- .1 Ground and bond all electrical systems in accordance with provisions of the Ontario Electrical Code.
- .2 Provide a grounding electrode in accordance with Section 10 of the Canadian Electrical Code.
- .3 Install grounding conductors to permit the shortest and most direct path from equipment to ground. Install grounding conductors in rigid galvanized conduit with both conductor and conduit bonded at both ends. Provide bonding jumpers with approved clamps to maintain ground continuity of metallic raceway systems at all expansion joints.
- .4 Ground connections to grounding conductors shall be accessible for inspection and made with approved solderless connectors bolted to the equipment of structure to be grounded. Clean contact surface prior to making connections to ensure proper metal to metal contact. Connections shall be of the type that grounds both conduit and conductor, and cap screws, bolts, nuts and washers shall be silicon bronze.

3.18 FIRESTOPPING & SEALING

- .1 Make fire rated and/or watertight where applicable seals at sleeves and other opening through floors and walls where conduit/cable passing through. Sleeves to extend minimum 25mm (1 inch) from both ends of the opening.
- .2 Provide firestopping protection of **all existing and new openings** through the floor, through the ceiling assembly, through the wall assembly regardless of the presence of any existing firestopping for existing penetrations.

- .3 Caulk spaces between conduit, cables, bus ducts, raceways, cabletrays with "Cerafibre" 2300 F packing to Building Department approval. Pack and seal both sides of openings with Electrovert "Flameseal" putty, minimum thickness 25 mm (1"). Install in accordance with Electrovert Instruction Bulletin #3601.
- .4 The Electrical Contractor is responsible for retaining the services of a specialized third-party Inspection Agency to inspect all firestopping completed for this project by the Electrical Division. Include all costs of the Inspection Agency in the Base Tender Price. The Inspection Agency is to provide a report certifying acceptance of all firestopping work completed as part of this project.

END OF SECTION



AUGUST 22, 2023

DIVISION 27 COMMUNICATION REQUIREMENTS

TORONTO DISTRICT SCHOOL BOARD

V1.8



Copyright © 2021 Toronto District School Board



Toronto District School Board

140 Borough Drive

Toronto, Ontario

www.tdsb.on.ca

Contents

0. Introduction	4
0.1. Background	4
0.2. Applicable Industry Standards and Codes	4
0.3. Materials	4
0.4. Roles and Responsibilities	5
0.5. Outlet Density Standards	5
0.5.1. UTP drops	5
0.5.2. Voice drops	7
5. Common Work Results for Communications	7
5.26. Grounding and Bonding for Communications Systems	7
5.28. Pathways for Communications Systems	8
5.29. Hangers and Supports for Communications Systems	8
5.33. Conduits and Backboxes for Communication Systems	9
5.36. Cable Trays for Communication Systems	9
5.39. Surface Raceways for Communications Systems	9
5.43. Sleeves and Sleeve Seals for Communications Pathways and Cabling	10
5.53. Identification for Communication Systems	10
6. Schedules for Communication	12
10. Structured Cabling	13
11. Communications Equipment Room Fittings	14
11.10. LAN Rooms	14
11.17. Communications Cabinets, Racks, Frames, and Enclosures	15
11.19. Communications Termination Blocks and Patch Panels	16
11.23. Communications Cable Management and Ladder Rack	18
11.26. Communications Rack Mounted Power Protection and Power Strips	19
13. Communications Backbone Cabling	19
13.23. Communications Copper Backbone Cabling	20
13.24. Communications Optical Fibre Backbone Cabling	20
13.43. Communications Services Cabling (Backbone)	20
15. Communications Horizontal Cabling	21
15.1. Communications Horizontal Cabling Applications	21
15.1.16. Voice Communications Horizontal Cabling	21

15.13.	Communications Copper Horizontal Cabling	21
15.43.	Communications Faceplates and Connectors	22
16.	Communications Connecting Cords, Devices, and Adapters	24
16.19.	Communications Patch Cords, Station Cords, and Cross Connect Wire	24
21.	Data Communications Network Equipment	24
21.33.	Data Communications Wireless Access Points	24
32.	Voice Communications Terminal Equipment	25
32.23.	Elevator Telephones	25

0. Introduction

0.1. Background

The purpose of this document is to provide a guideline for the standardization of the data/telecommunications cabling and Wireless Access Point installations at TDSB facilities, including schools and administration offices.

It shall be mandatory that these specifications are adhered to strictly by all TDSB staff and external contractors, for data/telecommunications related work on TDSB facilities.

0.2. Applicable Industry Standards and Codes

Adherence to and compliance with the codes, standards and industry practices listed below, along with the guideline contained in this document is mandatory.

- TIA/EIA 568-B series – Commercial Building Telecommunications Standards
- TIA/EIA 569-B series – Commercial Building Telecommunications Standards Pathways and Spaces
- TIA/EIA 606-A series – Administration Standard for Commercial Telecommunications Infrastructure
- TIA/EIA 607-A series – Commercial Building Grounding (Earthing) and Bonding Requirements for Telecommunications
- Fiber Optic Test Standards, TIA/EIA 455 (Series)
- Optical Fiber Systems Test Procedures, TIA/EIA 526 (Series)
- Local Area Network Ethernet Standard, IEEE 802.3 (Series)
- BICSI Telecommunications Distribution Methods Manual (TDMM)
- Ontario Electrical Safety Code (OESC)
- Ontario Building Code (OBC)

0.3. Materials

- If replacing an existing system, all old wiring and devices must be removed.
- All materials used for new installations or retrofits must
 - Meet the specifications and standards specified outlined in this document
 - Be sourced from a North American brand
 - Products must be of the same standards as identified in this document, and shall be reviewed and approved by TDSB
- Structured cabling components are recommended to be from the same manufacturer

0.4. Roles and Responsibilities

Unless otherwise specified in this document, it is the responsibility of the contractor to:

- Procure all materials and components required for the structured cabling system
- Perform the installation of components
- Execute the wiring of all components
- Terminate all wired components (in both the LAN Rooms and all faceplates/end locations)
- Supply, install, and test all other materials and equipment as described in this guideline

0.5. Outlet Density Standards

The following section describes the quantity of jacks/cables for specific applications/locations in the school facility.

Standards for room types not shown on this list will be on a case-by-case basis, during the design phase.

The final layout of all components will be subject to suit the specific site requirements and TDSB guidelines prior to tendering.

0.5.1. UTP drops

Room/Location	Minimum Requirements
Classroom	<ul style="list-style-type: none">- 1 UTP drop on front wall- 1 UTP drop on back wall- 1 UTP drop in ceiling space at the middle of the room, for Wireless Access Point
Department Office	<ul style="list-style-type: none">- 4 UTP drops on long wall- 1 UTP drop in ceiling space at the middle of the room, for Wireless Access Point
Caretaking Office	<ul style="list-style-type: none">- 2 UTP drops- 1 UTP drop in ceiling space at the middle of the room, for Wireless Access Point
Computer Lab	<ul style="list-style-type: none">- 1 UTP drop for each computer

	<ul style="list-style-type: none"> - One general-purpose power outlet (120VAC/15A) within 1 m/3' of each UTP drop - 1 UTP drop on back wall (for printer) - 1 UTP drop in ceiling space at the middle of the room, for Wireless Access Point
Individual Office (ie, Principal, Vice Principal, Counsellor, Librarian)	<ul style="list-style-type: none"> - 2 UTP drops near desk area - 1 UTP drop in ceiling space at the middle of the room, for Wireless Access Point
Main Office	<ul style="list-style-type: none"> - 2 UTP drops at each desk location - 1 UTP drop on reception counter (for courtesy phone) - 2 UTP drops at location of photocopier - UTP drop(s) in ceiling space for Wireless Access Point(s) to be identified during design phase
Library	<ul style="list-style-type: none"> - 2 UTP drops near entry, at location of circulation desk - Other UTP drops as identified during design phase - UTP drop(s) in ceiling space for Wireless Access Point(s) to be identified during design phase - 1 UTP drop in ceiling space at the front of the library, for future use - 1 UTP drop in ceiling space at the back of the library, for future use
Cafeteria	<ul style="list-style-type: none"> - 2 UTP drops at the front of the cafeteria (single faceplate) - 2 UTP drops at the back of the cafeteria (single faceplate) - UTP drop(s) for Wireless Access Point(s) to be identified during design phase
Cafeteria Office/Kitchen Office	<ul style="list-style-type: none"> - 2 UTP drops (single faceplate)
Gymnasium	<ul style="list-style-type: none"> - 2 UTP drops (single faceplate) - UTP drop(s) for Wireless Access Point(s) to be identified during design phase
Other non-instruction spaces	<ul style="list-style-type: none"> - 2 UTP drops on front wall - 1 UTP drop in ceiling space at the middle of the room, for Wireless Access Point

Foyer	- 2 UTP drops in ceiling space, for future use
Hallways	- 1 UTP drop at each end of the hallway, for future use - 1 UTP drop in ceiling space every 15 feet (spaced between drops at each end of hallway), for future use
Fire/security Alarm Panel (location varies)	- 1 UTP drop at each alarm panel

0.5.2. Voice drops

Room/Location	Minimum Requirements
Main LAN Room	- 1 voice drop near equipment rack
Main Office	- 1 voice drop at location of photocopier (to be used for fax line) *specific location identified at design time
Elevator	- 1 voice drop terminated in each Elevator Cab Room
Fire/security Alarm Panel (location varies)	- 1 voice drop at each alarm panel
Pool deck	- 1 voice drop *specific location identified at design time

5. Common Work Results for Communications

5.26. Grounding and Bonding for Communications Systems

1. A grounding bus bar shall be equipped with that is tied back to the building's grounding system.
2. Bonding conductors shall be continuous and routed in as direct a route as possible to the point of termination while adhering to the following: No bonding conductor shall vertically traverse a wall except at wall corners.
3. Clean ground bars prior to terminating bonding conductors.
4. Remove paint or finish from racks or other devices directly underneath the hardware to insure conductivity
5. Ground and bond per Manufacturer's specifications
6. The following components must be ANSI/TIA-607 "Commercial Building Grounding (Earthing) and Bonding Requirements for Telecommunications":

- Metallic equipment racks
- Cable shields
- Copper cable protector modules
- All metal raceways and cable trays
- Vertical busbars on each rack

5.28. Pathways for Communications Systems

1. General

- A. New installations in existing facilities must integrate with the existing structured data network cabling system
- B. Cable runs should use common areas, ie.: hallways.
- C. When running cable in existing installations, follow existing routes where possible.
- D. All wiring must be run either parallel to or perpendicular to walls
- E. Install cables above the (drop) ceiling (where feasible), otherwise install conduit (EMT) at max 2" diameter
- F. If cabling must cross power cables, it must do so at a 90-degree angle to avoid interference
- G. Cabling must not be exposed, except where allowed in the LAN Rooms; in other spaces, cabling must run in plenum spaces and/or in walls or in conduits/raceways

2. Vertical

- A. Conduit must be used for all vertical data pathways in sleeves (ie, between floors and running in exposed spaces in LAN Rooms).
- B. Each satellite LAN Room will be connected to the Main LAN Room with a 75 mm (3") conduit

5.29. Hangers and Supports for Communications Systems

1. No cables shall rest on suspended ceiling tiles.
2. J-hooks
 - A. When wiring is being installed in existing facilities, provide J-hooks in suspended ceiling space to support cables. Spacing between adjacent j-hooks should not exceed 5 feet.
 - B. Follow manufacturer's recommendations for allowable fill capacity for each size of cable hook.
 - C. Finishes
 - Cable hooks for non-corrosive areas shall be pre-galvanized steel, ASTM A653. Where additional strength is required, cable hooks shall be spring steel with a zinc-plated finish, ASTM B633, SC3.
 - Cable hooks for corrosive areas shall be stainless steel, AISI Type 304.
3. If there is no drop ceiling (or not accessible), all wiring must be run within conduit or EMT.

5.33. Conduits and Backboxes for Communication Systems

1. Conduits must be dedicated to data (UTP/fibre) runs and not shared with power, security or other services.
2. Conduits for the main trunk cabling running between floors must use trade size 4" (metric size 103) EMT
3. Insulated bushings must be provided at the opening of all conduits (or other sharp edges), to protect cables
4. Conduits/sleeves must protrude a minimum of 1" above the surface (ie, floor or ceiling tile)
5. Conduit must be anchored to structure
6. The maximum fill of conduits shall be 40 percent
7. Conduits runs will be no longer than 30m (98 feet) without a pull box
8. Within conduit runs, conduits bends may not exceed those permitted by the cable manufacturer(s)
9. Due to the corrosion issues of conduits and the loss of ground continuity created by loose set screws with EMT, the TDSB requires that a ground wire be installed in all conduits.
10. When cable is permitted to be pulled through a firewall, an EMT conduit must be used and seals with appropriate firestop material
11. No conduits shall terminate within the ceiling space of the room, with the exception of the conduit that carries wiring to service the same room only
12. Outlet boxes
 - A. Each data outlet in a wall shall be in a device box
 - B. There shall be no more than 4 cables in a single gang box
 - C. For 5 or more cables, a double-gang box shall be used

5.36. Cable Trays for Communication Systems

1. All trunk cabling in common areas shall be installed on cable trays or cable runway for all new construction.
2. Cable tray specifications
 - Width/depth: 18" x 6"
 - Type: Mesh type
 - Material: Steel

5.39. Surface Raceways for Communications Systems

1. Where cables cannot be run in the plenum or walls, surface raceways shall be used
2. Where permitted, any surface wiring in finished areas shall be run in Wiremold with finish to match background
3. No cable shall be run exposed
4. Wiremold to be secured to structure with mechanical fasteners
5. Faceplates are to be mounted in Wiremold boxes
6. No conduits shall terminate within the ceiling space of the room, unless the conduit is carrying wiring to serve that room

7. Single-gang boxes may be used for 4 or fewer cables
8. For 5 or more cables, double-gang boxes are to be used
9. Raceways are to be sized appropriately so as not to be filled beyond 40% capacity

5.43. Sleeves and Sleeve Seals for Communications Pathways and Cabling

Sleeves or conduits shall be used as required to protect exposed cabling and complete the installation of cables in a neat manner.

All conduits and conduit sleeves shall have bushings or grommets and shall be installed prior to the installation of communications cables to avoid damage and abrasions to cable sheathing and insulation. If the electrical Contractor does not install bushings, the communications cabling contract shall furnish and install bushings prior to pulling communications cabling

5.53. Identification for Communication Systems

Identification and labeling shall meet the requirements in this document, based on the current ANSI/TIA-606, "Administration Standard for the Telecommunications Infrastructure of Commercial Buildings".

1. Faceplate/Outlet - UTP/Data Drop

Label each faceplate and outlet with format **SA-NN** where:

- **S** is the alpha character identifying the LAN Room
- **A** is either one or two alpha character(s) uniquely identifying a single patch panel with sequentially numbered ports
- **NN** is two numeric characters designating the port on the patch panel

Eg. AC-11 represents port 11 on patch panel C in LAN Room A

2. Faceplate/Outlet - Voice Drop and Ceiling/Appliance UTP drop:

Label each faceplate and outlet with format **ST-NN** where:

- **S** is the alpha character identifying the LAN Room
- **T** signifies a voice drop
- **NN** is two numeric sequential number

Eg. CT-01 represents the first cable on the Bix in LAN Room C

3. Horizontal (UTP) Patch Panel (Cross-connect)

UTP patch panels must be uniquely labelled with one or two alpha character(s), from A-Z and AA-ZZ. Labelling should start with A on the topmost patch panel on the left-most rack, then working down. Labelling continues on the next rack.

4. Horizontal (UTP) Patch Panel Ports

Each port to be labelled with both of the following two labels:

- A. Port label, using the format SA-NN (see above)
- B. Description of end point, using the following format:
 - Room number, in the case of a faceplate
 - Device type:
 - WAP for Wireless Access Point and Room Number/location in the format: AP RMxxx
 - Camera for Security Camera and Room Number/location

Eg. AP RM109 represents a port for a Wireless Access Point in room 109

Eg. Room 213 represents a port for a faceplate in room 213

5. Horizontal (UTP) Cables

The two ends of a horizontal cable shall be labeled within 300 mm (12 inches) of the end of the cable jacket, using the format SA-NN.

6. Fibre Patch Panel (FPP)

A separate label for each fibre optic cable terminating in the enclosure shall be created. Labels are to be affixed to the front of the enclosure adjacent to the port.

Label must include:

- Number of strands
- Destination
- Origin

7. Vertical (backbone) - Fibre optic and UTP

The two ends of a vertical cable shall be labeled within 300 mm (12 inches) of the end of the cable jacket, with the destination and origin locations.

8. Vertical (backbone) - Fibre optic and UTP

The two ends of a vertical cable shall be labeled within 300 mm (12 inches) of the end of the cable jacket, with the destination and origin locations.

9. Labelling Standards

- The size, color, and contrast of all labels should be selected to ensure that the identifiers are easily read. Labels should be visible during the installation of and normal maintenance of the infrastructure.
- Labels should be resistant to the environmental conditions at the point of installation (such as moisture, heat, or ultraviolet light), and should have a design life equal to or greater than that of the labeled component.
- Labels are generally of either the adhesive or insert type. All labels must be legible, resistant to defacement, and maintain adhesion to the application surface.
- Labels applied directly to a cable shall have a clear vinyl wrapping applied over the label and around the cable to permanently affix the label.
- All labels shall be printed or generated by a mechanical device.
- Handwritten labels are NOT acceptable.
- Font must be sans-serif.
- Minimum font size for labels:
 - Port labels (LAN Room): 12 pt
 - Port labels (faceplates): 14 pt
 - Patch panel labels: 18 pt
 - Cable labels: 12 pt
 - Rack labels: 20 pt

6. Schedules for Communication

For each UTP drop and Voice drop installed in TDSB buildings, an “As-built” document is to be provided. The “As-built” document should include each UTP drop and Voice drop location corresponding to each panel port being activated on the panel.

For any new panels installed a new “As-built” must be created as part of the scope of the contractor's work. For new UTP drops activated to the existing panel, the UTP drop location information can be added to the existing “As-built” document.

“As-built” documents are to be typed and provided to the TDSB Project Supervisor in both physical and electronic copy, for distribution to IT Services.

10. Structured Cabling

Testing

- A. Transmission performance of structured cabling varies with length, connecting hardware, cords and total number of connections. The installer must take care to properly install the cabling components. To ensure that the installed structured cabling solution meets or exceeds the required performance it must be 'tested' or 'certified'.
 - B. Testing must be performed for each run of horizontal and vertical (backbone) cabling. The value of each testing parameter is to be reported.
 - C. The requirements for each category of cabling (Cat 6A and optical fibre optics) links are located in the ANSI/TIA-568 series standards.
 - D. Test equipment must meet the requirements set forth in the ANSI/TIA-568 series Standard for Field Test Equipment. All Copper testers shall be Level III. All fibre testers shall meet the requirements in ANSI/TIA-568.
1. Copper Cable (UTP) - Horizontal and Vertical
 - Distance (m or feet)
 - Wire Map (straight through, crossed, or open circuit)
 - Far End crosstalk
 - Near End crosstalk
 - Impedance
 - Noise Level
 - Attenuation Loss
 - Passive Resistance
 2. Optical fibre - Vertical
 - Every fibre port/end-face must be cleaned before every mating of fibre connectors including tester patch cords and launch cables
 - All strands in every installed cable shall be tested for insertion loss performed with a light source and power meter (LSPM) or optical loss test set (OLTS)
 - OTDR testing is required if it is a long outside plant cable with intermediate splices.
 - Testing shall be bi-directional and cover both working windows (850µm and 1300µm)
 3. Voice Cable - Horizontal
 - Tone each installed line for connectivity with the use of a Butt set

11. Communications Equipment Room Fittings

11.10. LAN Rooms

One (1) main LAN Room shall be provided on the first floor and satellite LAN Rooms shall be provided as required to suit cabling distances, etc. The TDSB prefers that the number of LAN Rooms be minimized as much as possible.

1. Location
 - A. LAN Rooms shall have direct access to the hallway or corridor.
 - B. They shall not be shared by other building services, nor shall they be used as a passageway to another room
 - C. LAN Rooms shall not be shared with or used for any function other than legitimate network/telecommunication systems
 - D. LAN Rooms shall not contain any type of sink or be used as storage for any cleaning supplies.
 - E. They shall not be located in, adjacent to, or underneath washrooms or boiler rooms.
 - F. LAN Rooms shall be located as centrally and as closely as possible to the area being served
 - G. Each satellite LAN Room will be connected to the main LAN Room with a 75 mm (3") conduit - used for the vertical backbone cable
 - H. LAN Room doors shall swing out
2. Main LAN Room
 - A. The LAN Room is where:
 - Primary network gear resides, and
 - Service provider feeds (ie, ISP, phone services) interface with network gear
 - B. Where possible, the main LAN Room should be located in the centre of the building.
 - C. Shall be located on the main floor of the building
 - D. To be a minimum size of 8 feet x 8 feet
3. Satellite LAN Rooms
 - A. To be a minimum size of 8 feet x 6 feet
4. Naming Standards
 - A. The main LAN Room shall be designated as A
 - B. Satellite LAN Rooms shall be and designated sequentially with letters B-Z
5. Access Control (by others)
 - A. Each LAN Room is to be keyed alike, with a security key not on the school's master lock system
 - B. LAN Rooms are to be equipped with a security access card reader and electric door strike

11.17. Communications Cabinets, Racks, Frames, and Enclosures

1. Free standing equipment racks shall be used.
2. Equipment shall meet the following standards
 - A. Specifications
 - 19-inch floor mountable 2-post rack
 - Colour: black
 - Material: steel with powder coat
 - Height: 84"
 - Channel rack depth: 3" minimum
 - Mounting holes: EIA universal mounting hole spacing (#12-24)
 - B. Reference standard: Panduit R2P
(<https://www.panduit.com/en/products/cabinets-thermal-management-racks-enclosures/racks-accessories/racks/r2p.html>)
3. Rack Layout:
 - A. The floor-mounted communication rack must allow for 32" of open space on the front and back of the rack
 - B. Racks must be fastened directly to the floor structure per manufacturer's recommendations, to provide stability
 - C. Multiple Racks
 - Additional racks are installed when insufficient space is available on existing racks, or to accommodate future growth
 - Racks must be placed along the same plane immediately adjacent to one another
 - D. Racks should be oriented parallel to the length of the room and the first rack should be placed at the furthest point into the room (at a minimum of 16" away from the perpendicular wall)
4. Environmental Provisions (by others)
 - A. There must be adequate light
 - B. LAN Rooms shall have adequate ventilation and preferred temperatures. The following standard should be followed:
(Based on ASHRAE: *Thermal Guidelines for Data Processing Environments*)
 - Allowable Temperatures: 64°F - 77°F
 - Allowable Temperatures: 59°F – 86°F
 - Allowable RH: 20% - 55%
5. Electrical Provisions (by others)
 - A. The LAN Room shall have a minimum of two duplex outlets per rack, installed on a separate circuit. The outlets should be labeled with power panel number and circuit number
 - B. Convenience duplex outlets shall be placed at 6 ft. intervals around the perimeter.
 - C. The power circuit shall be 20Amp with 15Amp breaker on the power panel and 15 Amp receptacles for future upgrade purpose

11.19. Communications Termination Blocks and Patch Panels

1. Horizontal cabling (UTP) Patch Panels

A. Standards

1. T568B shall be used for new installations where no pre-existing wiring exists
2. Where existing wiring is present, the wiring scheme used for additional/retrofit installations shall match the existing scheme (be it T568A or T568B)
3. All equipment must be Cat 6A rated

B. Equipment Specifications

1. Rack mountable (19" rack)
2. Number of ports: 24 or 48
3. Mount direction: horizontal/flat (non-angled)
4. Height: 1U (24 port) or 2U (48 port)
5. Port standard: T568 A/B, RJ-45
6. Termination style: keystones or punchdown (110 tool) termination at rear

C. Equipment Reference standards

1. Modular style:
 - Panel: Panduit CP24BLY (<https://www.panduit.com/en/products/copper-systems/patch-panels-accessories/modular-patch-panels/cp24bly.html>)
 - Modules: Panduit CJ6X88TGYL, yellow (<https://www.panduit.com/en/products/copper-systems/connectors/jack-modules/cj6x88tgy.html>)
2. Populated style: Panduit DP246X88TGY (<https://www.panduit.com/en/products/copper-systems/patch-panels-accessories/populated-patch-panels/dp246x88tgy.html>)

2. Fibre Patch Panels (FPP) – vertical/backbone

A. Equipment Specifications

1. Rack mountable (19" rack)
2. Height: 2U
3. Number of ports:
 - Main LAN Room: 24 duplex LC ports
 - Satellite LAN Rooms: 6 duplex LC ports (where applicable, if not served by Cat 6A UTP)
4. Mount direction: horizontal/flat
5. Connector: LC Multimode
6. Fibre optic splice method/module: Fusion (splice tray)
7. Port Colour: Aqua

B. Reference standards

1. Enclosure: Panduit Opticom Enclosure FRME2U (<https://www.panduit.com/en/products/fiber-optic-systems/fiber-optic-panels-cassettes-enclosures/fiber-optic-enclosures/frme2u.html>)

2. Modules: Panduit FAP6WAQDLCZ LC Fibre Adapter Panel
(<https://www.panduit.com/en/products/fiber-optic-systems/fiber-optic-panels-cassettes-enclosures/fiber-optic-panels/fap6waqdlcz.html>)
 3. Splice module: Panduit 24 Fusion Splice Module FOSMF
(<https://www.panduit.com/en/products/fiber-optic-systems/fiber-optic-panels-cassettes-enclosures/fiber-optic-enclosure-accessories/fosmf.html>)
3. Voice Termination
- A. Provider Demarcation
 1. Location: Room designated for carrier (usually electrical room - to be defined at design time)
 2. Mount type: Bix 10A (usually supplied by carrier)
 3. Mounting requirements: to be mounted on plywood backboard on exterior wall)
 4. Reference standard: Cablek PNBIX-10A Mount
(<http://www.cablek.com/product/PNBIX-10A>)
 - B. TDSB Distribution Point - Main Hub Room
 1. Location: Main Hub Room
 2. Mount type: Bix 2A
 3. Mounting requirements: to be mounted on plywood backboard
 4. Cross connect:
 - 1A strip #1 used for cross connect of tie cable run from demarcation point
 - 1A strip #2 used for distribution/horizontal cables to equipment terminations
 5. Reference standard: Cablek PNBIX-10C Mount
(<http://www.cablek.com/product/PNBIX-10C>) and Cablek PNBIX-2A
(<http://www.cablek.com/product/PNBIX-2A>)
 - C. TDSB Distribution Point - Satellite Hub Room(s)
 1. Location: Satellite Hub Room
 2. Mount type: Bix 2A
 3. Mounting requirements: to be mounted on plywood backboard
 4. Reference standard: Cablek PNBIX-10C Mount
(<http://www.cablek.com/product/PNBIX-10C>) and Cablek PNBIX-2A
(<http://www.cablek.com/product/PNBIX-2A>)

11.23. Communications Cable Management and Ladder Rack

1. Each rack shall have:
 - A. Two vertical cable managers (one affixed to each post), except for adjacent racks.
 - B. Adjacent racks may share a single vertical cable manager between them.
 - C. One cable tray, mounted at the midway point of the rack
2. Vertical cable manager
 - A. Specifications:
 - Height: Must run full height of rack
 - Depth: Minimum 5"
 - Width: Minimum 3.25"
 - Adjacent racks? double sided or single?
 - Door: Include hinged door to enclose cables
 - Must be from same manufacturer as rack
 - B. Reference standard: Panduit WMPVF45E
(<https://www.panduit.com/en/products/cabinets-thermal-management-racks-enclosures/cable-managers-accessories/vertical-cable-managers/wmpvf45e.html>)
3. Horizontal rack shelf
 - A. Specifications:
 - Mounting: 2-post
 - Depth: minimum of 18"
 - Colour: black
 - Material: steel with powder coat
 - B. Reference standard: Panduit SRM19X18A1
(<https://www.panduit.com/en/products/cabinets-thermal-management-racks-enclosures/racks-accessories/rack-accessories/srm19x18a1.html>)
4. Cable Trays:
 - Trays are to be used to support cables running from the vertical cable managers to all data cable conduits/sleeves that enter the room
 - Cable trays must run the length of the LAN Room
 - Trays shall run parallel to and above the equipment racks
 - If a drop ceiling is present, placement is to be above the drop ceiling
5. Plywood backboard
 - Each LAN Room will have a ¾ inch plywood backboard affixed to a minimum of one wall
 - Preference is to mount opposite the front of the rack
 - Plywood is to be treated with a fire-retardant coating
6. Rack elevation/equipment placement
 - All equipment is to be placed facing the same direction, at the front of the rack

- Top RU is typically populated with a 2 RU Fibre Patch Panel (FPP) – note: there will generally be only one fibre optic enclosure per LAN Room, on the first rack
- Next, leave 2 RU empty for future expansion
- Next, the UTP patch panels
- Next, a group of Network switches (to be installed by TDSB staff)
- At the bottom of the rack, UPSs and appliances (such as voice controllers, DVRs) will be placed (to be installed by TDSB staff)

Note: UTP patch panels must not be installed below network switches

11.26. Communications Rack Mounted Power Protection and Power Strips

1. Each rack is to contain at least one 0U (zero-U) PDU, affixed to one post
2. PDU Specifications:
 - Mounting direction: Vertical rack mountable
 - Form factor: 0U (Zero U)
 - Power type: 20A/120VAC
 - Outlet type: NEMA 5-15R
 - Outlets: minimum of 12
 - Cord length: minimum of 10'
 - Housing type: metal

13. Communications Backbone Cabling

Backbone cabling connects the main LAN Room with each satellite LAN Room (in a hierarchical/star topology).

1. Each satellite LAN Room must have a dedicated run to the main LAN Room; daisy-chaining is not permissible.
2. Service loops shall be provided at both ends of installed backbone cabling. A ten (10) foot service loop shall be provided in communication rooms and shall be installed to allow for future equipment rack/cabinet relocations without the need to re-terminate patch panels; the ten (10) foot service loop shall be neatly bundled and secured in cable trays. Additional Cable slack and service coils shall be stored properly above the ceiling.
3. Any cabling installed in equipment rooms shall be neatly placed in cabling trays, cabling runways, or horizontal and vertical rack/cabinet cable managers.
4. Velcro straps shall be utilized in the LAN Room for all cable bundling. Tie wraps are prohibited.
5. All backbone cabling must be run in EMT conduit for the full length between origin and destination locations.

13.23. Communications Copper Backbone Cabling

1. For cable runs of less than 100 meters between the main LAN Room and satellite LAN Room (inclusive of slack and service coils), Cat 6A shall be the cabling medium used.

13.24. Communications Optical Fibre Backbone Cabling

Each fibre backbone run consists of multimode fibre optic cable.

1. For cable runs equal or more than 100 meters between the main LAN Room and satellite LAN Room (inclusive of slack and service coils), Optical Fibre shall be the cabling medium used.
2. Specifications
 - Fibre Count: 12 strand
 - Fibre Type: 50/125 OM3 10Gb 300 Meter Multimode
 - Jacket Colour: Aqua
 - Fire rating: FT6/Plenum-rated
3. Reference standard: CommScope P-012-DZ-5L-FSUAQ
(https://www.anixter.com/en_us/products/P-012-DZ-5L-FSUAQ/COMMSCOPE-ENTERPRISE-SOLUTIONS/Indoor-Fiber-Optic-Cable/p/370-COMOM3-TBA-12)

13.43. Communications Services Cabling (Backbone)

13.43.13. Dialtone/Voice Services Backbone Cabling

1. Carrier Feed Cable
 - Cable type: 25 Pair
 - Routing: underground feed through conduit
 - Termination: At carrier demarcation point (Bix 10A)
2. Tie Cable
 - Source: Bix 10A at demarcation point
 - Destination: Bix 2A in Main Hub Room
 - Cable type: 25 Pair
3. Backbone Cable - Satellite Hub Rooms
 - Source: Bix 2A in Main Hub Room
 - Destination: Bix 2A in Satellite Hub Room
 - Cable type: Cat 6 cable

15. Communications Horizontal Cabling

15.1. Communications Horizontal Cabling Applications

15.1.16. Voice Communications Horizontal Cabling

The horizontal voice cabling system (aka distribution cabling) extends from the telecommunications outlet (voice drop) in the work area to the horizontal cross-connect (Bix block) in the nearest LAN Room. It includes the telecommunications outlet, horizontal cable, and the mechanical terminations that comprise the horizontal cross-connect.

1. Run Length - The maximum horizontal distance allowed between the Bix block in the LAN Room and the voice drop shall be 328 feet (100 meters), including service loops.
2. Any cabling installed in LAN Rooms shall be neatly placed in cabling trays, cabling runways, or horizontal and vertical rack/cabinet cable managers.
3. Velcro straps shall be utilized in the LAN Room for all cable bundling. Tie wraps are prohibited
4. Specifications
 - Standard: Certified Category 6 with factory warranty
 - Jacket Colour: Blue
 - Fire rating: FT6/Plenum-rated
 - Certification standard: ANSI/TIA-568-B

15.13. Communications Copper Horizontal Cabling

The horizontal UTP cabling system extends from the telecommunications outlet (UTP drop) in the work area to the horizontal cross-connect (patch panel) in the nearest LAN Room. It includes the telecommunications outlet, horizontal cable, and the mechanical terminations and patch cords that comprise the horizontal cross-connect.

1. Run Length - The maximum horizontal distance allowed between the LAN Room and the UTP drop shall be 295 feet (90 meters) as per the requirements of TIA/EIA for Cat 6A (given an assumed patch cable length of 10 meters), including service loops.
2. Service loops shall be provided at both ends of installed horizontal cabling. A three (3) foot service loop shall be installed in the ceiling space near workstation outlets (excessive cable shall not be coiled in outlet boxes). A ten (10) foot service loop shall be provided in communication rooms and shall be installed to allow for future equipment rack/cabinet relocations without the need to re-terminate patch panels; the ten (10) foot service loop shall be neatly bundled and secured in cable trays. Additional Cable slack and service coils shall be stored properly above the ceiling. This length must be subtracted from the 295' run.

3. Any cabling installed in LAN Rooms shall be neatly placed in cabling trays, cabling runways, or horizontal and vertical rack/cabinet cable managers.
4. Velcro straps shall be utilized in the LAN Room for all cable bundling. Tie wraps are prohibited
5. Specifications
 - Standard: Certified Category 6A with factory warranty
 - Jacket Colour: Yellow
 - Fire rating: FT6/Plenum-rated
 - Certification standard: ANSI/TIA-568-B
6. Reference standard: Panduit PUP6XC04YL-UG
 (https://www.anixter.com/en_us/products/PUP6XC04YL-UG/PANDUIT/Voice-and-Data-Cable/p/CMP-00423PND-C6A-05)

15.43. Communications Faceplates and Connectors

15.43.1. UTP/Data

1. Standards
 - A. The standard data outlet will consist of two copper cables terminated in RJ-45 jacks.
 - B. Data outlets should be installed within a proximity of 1 m/3' of power outlets.
 - C. The height of data outlets are typically at the same height of power outlets.
2. Equipment
 - A. Faceplate/Outlet - UTP/Data Drop
 - Flush faceplates are to be used at locations for end user devices
 - The jacks will be mounted in a 2-port faceplate
 - If a single drop is specified for a location, a 2-port drop shall still be used, for future expansion, and the unused port will be filled with a blank module
 - Faceplates are to be oriented vertically
 - All faceplates are to be mounted in a gang box or Wiremold box
 - Port type is to be RJ-45
 - Built-in label is recommended
 - Wiring standard is to match the port on the cross-connect/patch panel
 - Reference standard:
 - Faceplate : Panduit CFPL2WHY
 (<https://www.panduit.com/en/products/copper-systems/faceplates-boxes/faceplates/cfpl2why.html>)
 - Jack module: Panduit CJ6X88TGYL, yellow
 (<https://www.panduit.com/en/products/copper-systems/connectors/jack-modules/cj6x88tgyl.html>)

- Blank module: Panduit CMBWH-X
(<https://www.panduit.com/en/products/audio-video-systems/audio-video-modules/audio-video-modules/cmbwh-x.html>)
- B. Data outlet for ceiling-mounted device - UTP/Data
 - To be used for Wireless Access Points/Cameras/etc. that are flush mounted to a ceiling
 - Only used where the data outlet is in the plenum/non-visible space and not mounted in a gang box
 - The data outlets shall 2-port
 - If the 2nd port is used, a blank module is not required in the empty port
 - Port type is to be RJ-45
 - Built-in label is recommended
 - Reference standards:
 - Faceplate: Panduit CFPL2WHY
(<https://www.panduit.com/en/products/copper-systems/faceplates-boxes/surface-mount-boxes/cbxq2wh-a.html>)
 - Jack module: Panduit CJ6X88TGYL, yellow
(<https://www.panduit.com/en/products/copper-systems/connectors/jack-modules/cj6x88tgyl.html>)

15.43.2. Voice

1. Standards
 - A. The standard voice outlet will consist of a copper cable terminated in an RJ-11 jack.
 - B. The height of voice outlets are typically at the same height of power outlets.
2. Equipment
 - A. Faceplate/Outlet - Voice
 - Flush faceplates are to be used at locations for end user devices
 - The jacks will be mounted in a 1-port faceplate
 - Faceplates are to be oriented vertically
 - All faceplates are to be mounted in a gang box or Wiremold box
 - Port type is to be RJ-11
 - Built-in label is recommended
 - Reference standard:
 - Faceplate : Panduit CFPL2WHY
(<https://www.panduit.com/en/products/copper-systems/faceplates-boxes/faceplates/cfpl2why.html>)
 - Jack module: Panduit CJ66UEIY
(<https://www.panduit.com/en/products/copper-systems/connectors/jack-modules/cj66ueiy.html>)

16. Communications Connecting Cords, Devices, and Adapters

16.19. Communications Patch Cords, Station Cords, and Cross Connect Wire

1. UTP Patch cables
 - Connector type: RJ-45
 - Length: maximum length of 5 feet
 - Colour Coding

Location	Usage	Jacket Colour
LAN Room	Device (ie, UTP outlets/Wireless Access Points) - Cat 6	Yellow
LAN Room	Crossover (x) - Cat 6	Red
LAN Room	VoIP connection - Cat 6	Orange
End Point device (class, lab, etc.)	Device - Cat 6	Blue/White

2. Fibre Patch cables
 - Connector Type: LC-LC
 - Fibre Type: 50/125 OM3 10Gb Multimode
 - Jacket Colour: Aqua
3. UTP Patch cables, except where connected to Wireless Access Points or other devices installed by the contractor, will be supplied and installed by TDSB.

21. Data Communications Network Equipment

21.33. Data Communications Wireless Access Points

1. General
 - All Wireless Access Points (WAPs) are labelled and must be mounted at the location matching the floorplan
 - Drops for Wireless Access Points must use a dedicated UTP data outlet
 - Wireless Access Point must be connected to the data outlet using a patch cable
2. Mounting
 - Access Points to be mounted using the supplied cradle
 - Access Points to be secured into cradle using Torx screws
3. Hallways and classrooms
 - Access Points must be mounted horizontally
 - Mounting should take place on a t-bar ceiling or bracket

4. Height restrictions
 - Do not install Access Points higher than 10 feet
 - If not possible due to the ceiling height in an area where horizontal mounting is required, a 90-degree bracket to be supplied by TDSB to be mounted on a wall
 - All surface wiring in case of a wall mount in finished area shall be run in Wiremold with finish to match background
 - Provide a wall mounted outlet box complete with a faceplate for the RJ-45 jack and connect the Access Point with a patch cable.
5. Gymnasiums, cafeterias and auditoriums
 - Vertical mounting is permitted in these locations
 - Do not install Access Points higher than 10 feet
 - All surface wiring in case of a wall mount in finished area shall be run in Wiremold with finish to match background
 - Provide a wall mounted outlet box complete with a faceplate for the RJ-45 jack and connect the Access Point with a patch cable.
 - WAP Protection in gymnasiums
 - Plastic cover/enclosure must be installed to protect Wireless Access Points when installed in a gymnasium
 - Non-metallic (ie, polycarbonate) cover must be used to prevent signal degradation
 - Reference Standard: AccelTex ATS-ENC-12164P-LB
(<https://www.acceltex.com/shop/12x16x4-polycarbonate-lock-box-enclosure/>)

32. Voice Communications Terminal Equipment

32.23. Elevator Telephones

Elevator cabs have emergency phone systems that automatically call the TDSB Emergency Call Centre when activated.

- Cable pulled from Bix 2A mount in Main Hub Room to Elevator Cab Room(s)
- Basic analog telephone service will be installed by TDSB
- Elevator vendor to program call (when elevator button pressed)
 - Dial 94163954620 (TDSB Emergency Call Centre)

APPENDIX 'A'

00850	LIST OF DRAWINGS
00861	DOOR AND FRAME SCHEDULE

1.1 ARCHITECTURAL

A0-0 COVER PAGE
A1-1 OVERALL EXISTING SITE PLAN
A2-1 OVERALL FIRST FLOOR PLAN
A2-2 PARTIAL FIRST FLOOR PLAN - NEW & DEMO

1.2 STRUCTURAL

1.3 ELECTRICAL

E-1 ELECTRICAL LEGEND AND NOTES
E-2 FIRST FLOOR KEYPLAN
E-3 ELECTRICAL PART PLANS

End of Section

Door and Frame Schedule

Door No.	Door										Frame			Fire Rating	Remarks
	no. of leafs - width	height	thick	type	mat'l	finish	glass	ADO	HO	AI & CR	type	mat'l	finish		
	FIRST FLOOR														
AUD-1	EX	±2150	EX	EX	EX	EX	-	✓			-	EX	EX	EX	<u>Auditorium.</u> -Auditorium door at stage lift side.
AUD-2	EX	±2150	EX	EX	EX	EX		✓				EX	EX	EX	<u>Auditorium.</u> -Auditorium door at stage lift side.
AUD-3	2-EX.	EX	EX	EX	EX	EX	-		-	-	-	EX	EX	EX	<u>Auditorium.</u> Auditorium main entrance doors. Repair electric connections between BF. Push button and ex. door operator required
STA-1	1-EX.	EX	EX	EX	EX. WD	EX	-	✓	-	-	-	EX. WD	EX	EX	Provide new door operator and push button
165D-1	1-EX.	EX	EX	EX	EX	EX	-		-	-	-	EX	EX	EX	

Abbreviations

ADO–BF. Automatic Door Operator AI–AI Phones AL–Aluminum AN–Anodized Clear B/S–Both Sides B.F.–Barrier Free CR–Card Reader EP–Epoxy
 Ex–Existing Ext–Exterior FG–Fire Rated Tempered Glass HO– Hold-Open Device (Electromagnetic) IGU–Insulated Glazed Unit LG–Laminated Glass
 PL–P.Lam w/ High Quality Transparent Finish PRE–Prefinished PSF–Pressed Steel Frame PT–Paint TB –Thermally Broken TG–Clear Tempered Glass
 VAR–Varnish WD–Wood

Door and Frame Schedule

General Notes:

•	All ex. HM doors and frames proposed to be painted “PT”, to be well prepared first to receive new painting -see specs and should be painted both sides.
•	Reuse ex. HM frames where new doors to be installed in ex. openings. All ex. HM frames to be repainted.
•	Refer to Colour Schedule for paint colors of HM doors and frames.
•	Turn in all the old hardware on ex. Doors to be removed and/or replaced to TDSB but temporary remove & reuse the cylinder cores. Before temporarily storing the cylinder cores, label by marking on the core itself, which room number it came out from.
•	Site verify ex. door openings widths before door manufacturing. Wherever ex. door openings widths do not allow for installation of a min. 950mm wide door for new doors to be installed in ex. openings, GC to inform K+/TDSB to provide further direction.
•	All tempered, fire rated glass/firelite to be labelled by the manufacturer as such.
•	All fire rated doors to be labelled by Intertek or equivalent as such.
•	All new electromagnetic hold opens to be connected to the fire alarm system – see elec.
•	Refer to floor plan for the location side of the door operator, regardless GC is responsible to site verify the side the door operator can be mounted on where there is enough headroom to ceiling above the door. Preference is to mount the door operator on the push side, however if no enough headroom to ceiling ceiling space exists , GC to install on the opposite side and door operator to be specified as such. If no enough headroom to ceiling exists on either side, door operator to be installed within the ceiling bulkhead and be of the “recessed” type. Wherever an ADO is proposed for a double door, one door leaf to be ADO operated and the other leaf to have a door closer.
•	Installation of new doors cylinders for <u>existing doors</u> , will be done by TDSB hardware vendor (N.I.C.). All permanent cylinders will be purchased by the TDSB and installed by the school board hardware vendor-see hardware schedule. However, where indicated in the hardware schedule to provide new locksets for existing doors, the new locksets to have <u>compatible</u> temporary construction cylinders within and both to be provided by GC. Locksets to also be <u>compatible</u> with permanent construction cylinders which in turn will be provided by TDSB.
•	GC to install temporary construction cylinders within permanent locksets, compatible with the school’s master keying system of interchangeable core, for all <u>new doors</u> requiring keying. All permanent cylinders will be purchased by the TDSB after and installed by the school board hardware vendor-see hardware schedule.
•	AI and Card readers will be provided by TDSB. GC to provide and allow for the electric strikes and electrical connections and install only the AI and Card readers.

End of Section

Abbreviations

ADO–BF. Automatic Door Operator AI–AI Phones AL–Aluminum AN–Anodized Clear B/S–Both Sides B.F.–Barrier Free CR–Card Reader EP–Epoxy
Ex–Existing Ext–Exterior FG–Fire Rated Tempered Glass HO– Hold-Open Device (Electromagnetic) IGU–Insulated Glazed Unit LG–Laminated Glass
PL–P.Lam w/ High Quality Transparent Finish PRE–Prefinished PSF–Pressed Steel Frame PT–Paint TB –Thermally Broken TG–Clear Tempered Glass
VAR–Varnish WD–Wood

APPENDIX 'B' – REPORTS

Report 1 Hazardous Materials Survey dated June 6, 2024
prepared by T. Harris Environmental Management



T. HARRIS
ENVIRONMENTAL MANAGEMENT
since 1979

93 Skyway Avenue, Suite 101
Toronto, Ontario M9W 6N6
Tel. (416) 679-8914
Fax. (416) 679-8915
1-888-ASK-THEM

**HAZARDOUS MATERIALS SURVEY
Downsview Secondary School
7 Hawksdale Road
Toronto, Ontario
M3K 1W3**

Issued: June 6, 2024

Prepared for:

Reem Makhoul

Project Supervisor

Toronto District School Board

15 Oakburn Crescent

Toronto, Ontario

M2N 2T5

Prepared by:

T. Harris Environmental Management Inc.

93 Skyway Avenue, Suite 101

Toronto, Ontario

M9W 6N6

THEM Project #: T26-52809



TABLE OF CONTENTS

1.0	INTRODUCTION	1
2.0	ONTARIO REGULATIONS AND GUIDELINES FOR SURVEY	2
3.0	SURVEY METHODOLOGY	2
3.1	INVESTIGATED AREAS	2
3.2	SAMPLING AND ASSESSMENT METHODOLOGIES	2
3.2.1	<i>Asbestos-containing Materials</i>	<i>3</i>
3.2.2	<i>Lead-containing Materials</i>	<i>5</i>
3.2.3	<i>PCB-containing Materials</i>	<i>6</i>
4.0	FINDINGS	7
4.1	DESIGNATED SUBSTANCES	7
4.1.2	<i>Acrylonitrile</i>	<i>7</i>
4.1.3	<i>Arsenic</i>	<i>7</i>
4.1.4	<i>Asbestos</i>	<i>7</i>
4.1.5	<i>Benzene</i>	<i>10</i>
4.1.6	<i>Coke Oven Emissions</i>	<i>10</i>
4.1.7	<i>Ethylene Oxide</i>	<i>10</i>
4.1.8	<i>Isocyanates</i>	<i>10</i>
4.1.9	<i>Lead</i>	<i>10</i>
4.1.10	<i>Mercury</i>	<i>10</i>
4.1.11	<i>Silica</i>	<i>11</i>
4.1.12	<i>Vinyl Chloride</i>	<i>11</i>
5.0	CONCLUSIONS AND RECOMMENDATIONS	11
5.1	DESIGNATED SUBSTANCES	11
5.1.1	<i>Asbestos</i>	<i>11</i>
5.1.2	<i>Benzene</i>	<i>12</i>
5.1.3	<i>Lead</i>	<i>12</i>
5.1.4	<i>Mercury</i>	<i>12</i>
5.1.5	<i>Silica</i>	<i>13</i>
5.2	GENERAL	14
6.0	LIMITATIONS	15
APPENDIX I: Site Photographs		
APPENDIX II: Laboratory Certificate of Analysis		
APPENDIX III: Site Drawings		



EXECUTIVE SUMMARY

T. Harris Environmental Management Inc. (THEM) was retained by Toronto District School Board (TDSB) to conduct a project specific Hazardous Materials Survey within the accessibility upgrade project specific work areas at Downsview Secondary School – 7 Hawksdale Road, Toronto, Ontario. The objective of this study was to determine whether any hazardous building materials, including Designated Substances, as defined under the Ontario Occupational Health and Safety Act, were present in the selected areas surveyed. The survey was conducted on March 13, 2026.

Based on the investigation conducted by T. Harris Environmental Management, through available records, interviews and a site review, the following were identified:

- At the time of the survey, confirmed asbestos containing materials were identified in the project specific areas and are detailed in **Table I** below. Referenced from TDSB AMP. 12" x 12" vinyl floor tile beige with white streaks found within Backstage (Monument #5364) has been determined to contain **5% Chrysotile** asbestos. Parging cement on fittings found throughout the building has been determined to contain **70% Chrysotile** asbestos. All these materials have been assigned a **priority 2** rating. Materials found to be asbestos containing are bolded and highlighted in yellow in **Table I** below.

TABLE I
Summary of Asbestos Containing Materials
Downsview Secondary School
7 Hawksdale Road, Toronto, Ontario
March 18, 2026

Location	Description	Asbestos Content	Priority	Friable (Y/N)
*** Backstage (5364)	12" x 12" Vinyl Floor Tile Beige with White and Dark Streaks	5% Chrysotile	2	N
*** Throughout Building	Parging Cement on Fittings	70% Chrysotile	2	N

***- Source: Referenced from TDSB AMP.

- Concentrations of lead were identified in the cream and off-white paint within the project specific areas. All paints sampled was observed to be in good condition. Materials containing less than or equal to 0.1% lead by weight are considered low-level lead materials. A summary of the materials and their associated lead concentrations can be found in **Table II** below. Paints observed in the surveyed area that are similar in colour to other paints listed in **Table II**, should be assumed to have the same lead concentrations unless proven otherwise. Materials containing a lead concentration greater than 0.1% are bolded and highlighted in yellow. Lead is suspected to be present as a component in pipes and in solder used in pipe fittings.



Table II
Summary of Lead Bulk Samples
Downsview Secondary School
7 Hawksdale Road, Toronto, Ontario
March 18, 2026

Sample	Location	Material Description	Condition	Lead Concentration (Lead by weight %)
L1	Stage (5513)	Off-white paint	Good	1.4
L2	Corridor (5363-1)	Cream paint	Good	1.4

- Liquid mercury may be present within wall mounted thermostatic switches and mercury vapour is suspected to be present in fluorescent light fixture bulbs.
- Silica may be present in building materials in two forms: i) amorphous silica (commonly found in insulation materials); and ii) free crystalline (α -Quartz) (commonly found in ceiling tiles and gypsum board). Silica (including free crystalline silica) may also be a component of concrete and brick surfaces noted in the investigated areas.
- Chlorofluorocarbons (CFCs) are organic compounds that contain carbon, chlorine, and fluorine atoms. These compounds are likely to be found as coolants in refrigeration and air conditioners which are suspected to be present within the building.

Based on the aforementioned findings for the survey conducted, THEM recommends the following:

- All waste material must be handled and disposed of according to the Revised Regulation of Ontario 347/90 as amended – made under the Environmental Protection Act. Lead and/or Mercury waste may be subject to Leachate Criteria (Schedule 4) of this regulation.
- At the time of removal or replacement of fluorescent light ballasts, the ballasts should be inspected for PCB content. All PCB materials must be handled and stored as outlined in the Revised Regulation of Ontario 362/90. In addition, requirements outlined in the federal regulation SOR/2008-273 made under the Canadian Environmental Protection Act, 2008 must be adhered to as well.
- Prior to performing construction, renovations or demolition, the Occupational Health & Safety Act Section 30 (1-4) requires an inventory of all Designated Substances to be submitted to the general contractor who in turn must submit the same list to all their subtrades. Submission of this report to all parties will satisfy this requirement.



-
- Building material(s) that are not detailed within this survey due to inaccessibility during the time of the survey and/or are uncovered during renovation/demolition activities, notably materials that are suspected to contain asbestos, should be properly assessed by a qualified person prior to their disturbance.

This survey satisfies requirements of the Occupational Health and Safety Act, Section 30, Subsection 2, 3 and 4, with regards to the presence/absence of hazardous materials identified within this report. This executive summary is not to be used alone and the report should be reviewed in its entirety.

Should you have any questions or comments regarding this survey, please do not hesitate to contact our office.

Sincerely,

T. HARRIS ENVIRONMENTAL MANAGEMENT INC.



March 18, 2026

Toronto District School Board
15 Oakburn Crescent
Toronto, Ontario
M2N 2T5

ATTN: Reem Makhoul
Project Supervisor

RE: TDSB – Downsview Secondary School – Accessibility Upgrades
7 Hawksdale Road, Toronto, Ontario, M3K 1W3
THEM Project: 52809

1.0 INTRODUCTION

T. Harris Environmental Management Inc. (THEM) was retained by Toronto District School Board (TDSB) to conduct a project specific Hazardous Materials Survey within the accessibility upgrade project specific work areas at Downsview Secondary School – 7 Hawksdale Road, Toronto, Ontario. The objective of this study was to determine whether any hazardous building materials, including Designated Substances, as defined under the Ontario Occupational Health and Safety Act, were present in the selected areas surveyed. The survey was conducted on March 13, 2026.

The objective of this survey was to determine whether any hazardous materials, including Designated Substances, as defined under the Ontario Occupational Health and Safety Act, Mould, Polychlorinated Biphenyls (PCBs) and Chlorofluorocarbons (CFCs) were present within the selected areas surveyed. The survey included a review of the selected areas for the presence and extent of hazardous materials, evaluation of the type of hazardous materials and degree of possible exposure, and assessment of requirements for any further investigation or remedial action, if necessary.

Identification of suspect asbestos materials and lead in paint was performed by means of bulk sampling and laboratory analysis. Other hazardous materials, if present, were identified by visual inspection only. These included mercury in gauges and light fixtures, polychlorinated biphenyls (PCBs) in coolant oils of transformers and fluorescent light fixture ballasts, and silica in cement. Recommendations based on our findings are made in Section 5.0.

This report documents our findings as noted during our site inspection. Individual assessments were made to identify Designated Substances and their condition, as well as requirements for special treatment such as control programs or specialized removal and disposal techniques.



2.0 ONTARIO REGULATIONS AND GUIDELINES FOR SURVEY

Ontario Regulation 490/09 — Designated Substances, made under the Ontario Health and Safety Act, applies to controlling designated substances in the workplace. This regulation may not be all encompassing for each of the Designated Substances and other associated Ontario Regulations may apply.

In addition to the Ontario Regulation 490/09 noted above, the following were observed for this survey:

- Guideline: Lead on Construction Projects, issued April 2011 by the Occupational Health and Safety branch of the Ministry of Labour
- Guideline: Silica on Construction Projects issued April 2011 by the Occupational Health and Safety branch of the Ministry of Labour.

All waste materials are regulated by Ontario Regulation 347/90 as amended, made under the Environmental Protection Act.

3.0 SURVEY METHODOLOGY

Not all Designated Substances or suspect hazardous materials were sampled. Sampling was carried out only for those compounds that were known to be present or those deemed to have a likely source of origin in the selected areas under study.

All sample analyses were performed by an independent laboratory and the Laboratory Certificates of Analysis are attached in Appendix II. Materials similar in appearance or texture to other materials tested were considered to be of similar composition.

3.1 Investigated Areas

Photographs of the areas investigated can be found in Appendix I. The survey included all accessible areas within the selected areas as required under our scope of work. Destructive investigation such as cutting holes in walls, floors, or ceilings to observe materials within was not performed.

3.2 Sampling and Assessment Methodologies

Samples of confirmatory lead-based materials were collected during the survey.

NOTES: Repetitive testing of homogeneous materials building materials suspected to contain asbestos was performed as per the requirements of Ontario Regulation 278/05 – made under the Occupational Health and Safety Act.



Although every effort was taken to investigate all areas of this structure, some areas not shown on the supplied drawings may have been overlooked. Architectural drawings, including as built, should be consulted to ensure that this assessment is complete, with any discrepancies brought to our attention.

Destructive testing was not performed. Therefore, in the event asbestos containing materials are discovered as part of the survey, inferences have been drawn for inaccessible spaces (i.e. above plaster ceilings with no access panels) based upon findings in adjacent spaces. Similarly, motors, blowers, electrical panels, etc., were not de-energized or disassembled to examine concealed conditions. Such items should be considered to have asbestos as a component until proven otherwise.

Boilers were frequently constructed (i.e. lined, bedded, etc.) with asbestos refractory materials. Demolition and/or renovations to existing boiler units which may elicit a disturbance of suspect ACM's should necessitate prior investigation to determine the presence of ACM's. In addition, fire doors that may be present in the surveyed areas were not tested intrusively and therefore should be considered to contain ACM's until proven otherwise. Further examples of such assumptions include elevator brakes, roofing felts and mastics, caulking, high voltage wiring, mechanical packing and gaskets, and underground services or piping.

3.2.1 Asbestos-containing Materials

Sampling of suspected asbestos containing building materials observed within the surveyed area is typically conducted as per the requirements of Table 1 found within Ontario Regulation 278/05, however asbestos bulk sampling was not required during this assessment. A summary of the sample requirements can be found in **Table III**.



TABLE III
Summary of Asbestos Bulk Sampling Requirements

Type of material	Size of area of homogeneous material	Minimum # of bulk material samples to be collected
Surfacing material, including without limitation material that is applied to surfaces by spraying, by troweling or otherwise, such as acoustical plaster on ceilings and fireproofing materials on structural members	<90 m ²	3
	>90 m ² but <450 m ²	5
	>450 m ²	7
Thermal insulation, except as described in item 3	Any size	3
Thermal insulation patch	<2 m or 0.5 m ²	1
Other material	Any size	3

Preliminary identification of the samples is made using polarized light microscopy (PLM), with confirmation of presence and type of asbestos made by dispersion staining optical microscopy. This analytical procedure follows the U.S. Environmental Protection Agency Test Method EPA/600/R-93/116 Method for the Determination of Asbestos in Bulk Building Materials, June 1993. Laboratory Certificates of Analysis for this identification are given in Appendix II.

Materials identified to contain asbestos were assessed on the relative possibility of fibre release into the air due to a combination of their condition and accessibility. Priorities have been established for remedial action based on these combinations and are given below.

Priority 1 (One)

- Asbestos-containing material highly recommended to be removed, repaired, or encapsulated.

Priority 2 (Two)

- Asbestos-containing materials could remain in place until system upgrading, or renovations are to occur.

Priority 3 (Three)

- Asbestos-containing material could remain in place until eventual building demolition.



3.2.2 Lead-containing Materials

Paints were observed in the surveyed areas. Other building materials not tested for lead content (i.e. mortar, concrete) should be considered lead-containing until proven otherwise.

Currently in Ontario, there is no regulation that provides a definition of what the percent of lead in paint must be in order to be considered “lead based paint”. The Surface Coating Materials Regulations (SOR/2005-109) made under the Canada Consumer Product Safety Act specifies that the concentration of total lead present in a surface coating material must not be more than 600 mg/kg. The Surface Coatings Materials Regulations came into effect on April 19th, 2005 and was amended in November of 2010, which lowered the acceptable concentration of total lead present in a surface coating material to less than 90 mg/kg (SOR/2010-224). This lead content applies to any paint and/or surface coatings of products advertised, sold or imported into Canada. Coatings applied to furniture, pencils, artists' brushes, toys and articles that are intended for children would fall under the jurisdiction of this regulation. However, these levels are not specifically intended to determine what constitutes a “lead based paint”, it is merely a regulation to protect consumers of coated materials. Therefore, this regulation does not apply to construction projects where lead-based coatings may be disturbed during the course of renovations or construction.

To date, there is no simple correlation between the concentration of lead in paints/surface coatings and the resulting airborne lead levels that may be emitted if the coated material was to be disturbed or removed. However, the EACO “Lead Guideline for Construction, Renovation, Maintenance or Repair”, published October 2014 (herein referred to as ‘EACO Guideline’), outlines “virtually safe” lead levels for paints or surface coatings. Paints or coatings containing less than or equal to 0.1% lead by weight¹ are considered low-level lead paints or coatings. If these paints or coatings are disturbed in a manner, which uses normal dust control procedures, and does not exceed the particulate not otherwise specified (PNOS) time-weighted average (TWA) of 0.05 mg/m³ set in Ontario Regulation 490/09, then worker protection from the inhalation of lead is not required. Projects that meet these guidelines must still adhere to general health and safety precautions, such as prohibiting eating, smoking, drinking or chewing gum in the work area. These projects must also implement dust suppression techniques and provide facilities for workers to wash their hands and face. Additionally, the Occupational Health and Safety branch of the Ministry of Labour (MOL) provides classifications of the types of specific lead operations, which are based on presumed airborne lead concentrations to which the worker will be exposed. The classifications are provided in the MOL publication, “Guideline: Lead on Construction Projects”, published in September 2004 and revised in April 2011 (herein referred to as ‘MOL Guideline’). The levels of airborne lead expected to be present in a work area is related to the types of work operations being used to disturb or remove the coatings; it is not a

¹ WHMIS reporting limit for lead in a safety data sheet or material safety data sheet.



function of the percentage of lead within the coating. Based on this MOL Guideline, all paints/surface coatings are to be considered lead containing unless they are tested and contain undetectable lead concentrations.

Lead is also suspected to be a component in solder on plumbing fixtures throughout the building. Representative samples of solder joints suspected to contain lead were not collected. Other suspect lead-containing materials such as lead sheeting, conduit, pipes and lead-calcium battery plates were not sampled during this investigation but were noted where applicable.

3.2.2.1 Bulk Sampling for Lead in Paints

To verify lead content in paints, representative bulk samples of paints were retrieved for laboratory analysis for lead content. Paint samples were scraped down to the building base structure, with all possible layer's present, then submitted to an independent laboratory. Samples were treated with a dilute nitric acid sample digestion prior to filtration. Analysis utilized for lead detection in filtered samples was Flame Atomic Absorption Spectroscopy (F.A.A.S.).

3.2.3 PCB-containing Materials

PCB's are not recognized as a Designated Substance, as outlined in the Ontario Occupational Health and Safety Act, however, a review of a number of representative and accessible fluorescent light ballasts suspected to contain PCBs were included in the survey. In addition, accessible building hydraulic equipment (i.e. elevators/lifts) or electrical transformers observed during the survey were visually reviewed. No sampling of materials for PCB content was conducted as a part of this survey. In addition, no other materials were reviewed/inspected as a part of this survey. Thus, the following materials should be assumed, if present onsite, to contain PCB's until proven otherwise: cable insulation, thermal insulation materials (i.e. foam, felt), adhesives/tapes, plastics, caulking, lead based paints and, various types of electrical equipment (i.e. voltage regulators, switches, bushings, electromagnets).

Polychlorinated biphenyl-containing ballasts reviewed were identified by model number, serial number, and date code, as listed in Environment of Canada Identification of Lamp Ballasts Containing PCBs - Report EPS 2/CC/2 (revised), August 1991. No bulk sampling of suspect PCB-containing materials was performed during this survey. Findings with respect to PCBs are presented in Section 4.12.



4.0 FINDINGS

The following includes observations for any hazardous materials identified within the area surveyed. The survey focused on building materials and as such there may be Designated Substances in equipment that was present within the surveyed area.

4.1 Designated Substances

4.1.2 *Acrylonitrile*

No source was identified. Acrylonitrile or ACN (also known as vinyl cyanide) is an explosive, flammable liquid used in the manufacture of acrylic fibres, rubber-like materials, and pesticide fumigants.

4.1.3 *Arsenic*

No source was identified within the surveyed areas. Arsenic is used in metallurgy for hardening copper, lead, and alloys, in pigment production, in the manufacture of certain types of glass, in insecticides, fungicides and rodenticides, as a by-product in the smelting of copper ores, and as a dopant material in semiconductor manufacturing. Chromated copper arsenate was also historically used as a wood preservative in playground structures.

4.1.4 *Asbestos*

Laboratory analysis results of bulk samples are given in Appendix III with results summarized in **Table IV**. Samples found to be asbestos containing are bolded and highlighted in yellow.



TABLE IV
Summary of Asbestos Bulk Samples
Downsview Secondary School
7 Hawksdale Road, Toronto, Ontario
March 18, 2026

Sample #	Location	Description	Asbestos Content
1.1	Backstage (5364)	Block Fill – Gray/White/Yellow	ND
		Mortar – Gray	ND
1.2	Corridor (5363-1)	Block Fill – Gray/White/Yellow	ND
		Mortar – Gray	ND
1.3	Stage (5513)	Block Fill – White/Beige	ND
		Mortar – Gray	ND
2.1	Stage (5513)	Joint Compound – Beige	ND
		Skim Coat – White	ND
		Rough Coat – Gray/White	ND
2.2	Stage (5513)	Joint Compound – White	ND
		Skim Coat – White	ND
		Rough Coat – Gray/White	ND
2.3	Stage (5513)	Joint Compound – Beige	ND
		Skim Coat – White	ND
3.1	Backstage (5364)	Block Fill – Gray/White/Yellow	ND
		Mortar – Gray	ND
3.2	Corridor (5363-1)	Mortar – Brown Gray	ND
3.3	Corridor (5363-1)	Block Fill – Beige	ND
		Mortar – Gray	ND
***	Backstage (5364)	12" x 12" Vinyl Floor Tile Beige with White and Dark Streaks	5% Chrysotile
***	Throughout Building	Parging Cement on Fittings	70% Chrysotile
***	Backstage (5364)	2" x 4" Wiggly Large Lengthwise Fissure and Pinhole Ceiling Tile	ND

ND – None Detected, *** - Source: TDSB Asbestos Management Program

4.1.4.1 Fireproofing

No fireproofing was observed in the surveyed areas.

4.1.4.2 Texture Finishes

No texture finish was observed in the surveyed areas.

4.1.4.3 Mechanical Pipe Insulation

Linear Mechanical Pipe Insulation



No linear mechanical pipe insulation was observed in the surveyed areas.

Mechanical Pipe Fitting Insulation

Insulation was observed on pipe fittings in the surveyed area. Material was previously tested and determined to contain **70% Chrysotile** asbestos.

HVAC Duct Insulation

No insulation was observed on the HVAC ductwork within the surveyed area.

4.1.4.4 Plaster

Plasters were observed in the surveyed area. Material was sampled (sample set - 2.1 – 2.3), tested and determined to contain no asbestos.

4.1.4.5 Ceiling Tiles

Ceiling tiles were observed in the surveyed area. Materials were previously tested and determined to contain no asbestos.

4.1.4.6 Vinyl Floor Tiles

Vinyl floor tiles were observed in the surveyed area. Materials were previously tested and determined to contain **5% Chrysotile** asbestos.

4.1.4.7 Vinyl Sheet Floor

No vinyl sheet flooring was observed in the surveyed area.

4.1.4.8 Drywall Joint Compound

No drywall joint compound was observed in the surveyed area.

4.1.4.9 Other Materials

Block mortar was observed within the surveyed area. Materials were sampled (sample set – 3.1 – 3.3) tested and found to contain no asbestos.

Block Fill was observed within the surveyed area. Materials were sampled (sample set – 1.1 – 1.3) tested and found to contain no asbestos.



4.1.5 Benzene

No source was identified within the surveyed areas. Benzene or benzol is a colourless liquid. It is used as an intermediate in the production of styrene, phenol, cyclohexane, and other organic chemicals, and in the manufacture of detergents, pesticides, solvents, polymers, plastics, resins and paint removers. It is also found in gasoline.

4.1.6 Coke Oven Emissions

Not applicable for the areas surveyed.

4.1.7 Ethylene Oxide

No source was identified. Ethylene oxide is a colourless gas liquefying below 12°C. It is used generally as a fumigant and sterilizing agent for medical equipment.

4.1.8 Isocyanates

No source was identified. Isocyanates (HDI, MDI and TDI) are used in the production of polyurethane and as an elastomer in casting compounds, mastics, and textile coatings (IPDI).

4.1.9 Lead

Concentrations of lead were identified in the cream and off-white paint within the project specific areas. All paints sampled was observed to be in good condition. Materials containing less than or equal to 0.1% lead by weight are considered low-level lead materials. A summary of the materials and their associated lead concentrations can be found in **Table V** below. Paints observed in the surveyed area that are similar in colour to other paints listed in **Table V**, should be assumed to have the same lead concentrations unless proven otherwise. Materials containing a lead concentration greater than 0.1% are bolded and highlighted in yellow. Lead is suspected to be present as a component in pipes and in solder used in pipe fittings.

Table V
Summary of Lead Bulk Samples
Downsview Secondary School
7 Hawksdale Road, Toronto, Ontario
March 18, 2026

Sample	Location	Material Description	Condition	Lead Concentration (Lead by weight %)
L1	Stage (5513)	Off-white paint	Good	1.4
L2	Corridor (5363-1)	Cream paint	Good	1.4



4.1.10 Mercury

Mercury vapour is suspected to be present in fluorescent light tubes. No source was identified within the surveyed area.

4.1.11 Silica

Silica may be present in the building in insulation materials. Free crystalline silica (α -Quartz) may be a component in ceiling tiles and gypsum board. Silica (including free crystalline silica) may also be a component of concrete and brick surfaces noted in the building.

4.1.12 Vinyl Chloride

No source was identified. Vinyl chloride, also known as chloroethylene, is a colourless gas but is usually handled as a liquid under pressure. It is used in the production of PVC resins and in organic synthesis.

5.0 CONCLUSIONS AND RECOMMENDATIONS

T. Harris Environmental Management Inc. (THEM) was retained by Toronto District School Board (TDSB) to conduct a project specific Hazardous Materials Survey within the accessibility upgrade project specific work areas at Downsview Secondary School – 7 Hawksdale Road, Toronto, Ontario. The objective of this study was to determine whether any hazardous building materials, including Designated Substances, as defined under the Ontario Occupational Health and Safety Act, were present in the selected areas surveyed. The survey was conducted on March 13, 2026.

The following summarizes hazardous building materials identified within the surveyed area.

5.1 Designated Substances

5.1.1 Asbestos

At the time of the survey, confirmed asbestos containing materials were identified in the project specific areas and are detailed in **Table I** below. Referenced from TDSB AMP. 12" x 12" vinyl floor tile beige with white streaks found within Backstage (Monument #5364) has been determined to contain **5% Chrysotile** asbestos. Parging cement on fittings found throughout the building has been determined to contain **70% Chrysotile** asbestos. All these materials have been assigned a **priority 2** rating. Materials found to be asbestos containing are bolded and highlighted in yellow in **Table VI** below.



TABLE VI
Summary of Asbestos Containing Materials
Downsview Secondary School
7 Hawksdale Road, Toronto, Ontario
March 18, 2026

Location	Description	Asbestos Content	Priority	Friable (Y/N)
*** Backstage (5364)	12" x 12" Vinyl Floor Tile Beige with White and Dark Streaks	5% Chrysotile	2	N
*** Throughout Building	Parging Cement on Fittings	70% Chrysotile	2	N

***- Source: Referenced from TDSB AMP.

5.1.2 Benzene

Benzene is not suspected to be present in the surveyed areas.

5.1.3 Lead

Concentrations of lead were identified in the cream and off-white paint within the project specific areas. All paints sampled was observed to be in good condition. Materials containing less than or equal to 0.1% lead by weight are considered low-level lead materials. A summary of the materials and their associated lead concentrations can be found in **Table VII** below. Paints observed in the surveyed area that are similar in colour to other paints listed in **Table VII**, should be assumed to have the same lead concentrations unless proven otherwise. Materials containing a lead concentration greater than 0.1% are bolded and highlighted in yellow. Lead is suspected to be present as a component in pipes and in solder used in pipe fittings.

Table VII
Summary of Lead Bulk Samples
Downsview Secondary School
7 Hawksdale Road, Toronto, Ontario
March 18, 2026

Sample	Location	Material Description	Condition	Lead Concentration (Lead by weight %)
L1	Stage (5513)	Off-white paint	Good	1.4
L2	Corridor (5363-1)	Cream paint	Good	1.4

5.1.4 Mercury

Mercury vapour is suspected to be present in fluorescent light tubes. No source was identified within the surveyed area.



Precautions must be taken to prevent mercury vapours from becoming airborne during building demolition. Exposure to airborne mercury is regulated under Ontario Regulation 490/09, *Designated Substances* - made under the Occupational Health and Safety Act.

5.1.5 Silica

Silica may be present in building materials in two forms: i) amorphous-diatomaceous earth (commonly found in insulation materials); and ii) free crystalline (α -Quartz) (commonly found in ceiling tiles and gypsum board). Silica (including free crystalline silica) may also be a component of concrete and brick surfaces noted in the investigated areas.

Precautions must be taken to prevent silica-containing particles from becoming airborne during the disturbance of silica-containing surfaces, such as during renovation or demolition projects. Exposure to airborne silica is regulated under Ontario Regulation 490/09, *Designated Substances* - made under the Occupational Health and Safety Act. All work being carried out with silica containing materials should be conducted following Guideline: Silica on Construction Projects issued April 2011 by the Occupational Health and Safety branch of the Ministry of Labour.



5.2 General

Precautions must be taken to prevent mercury vapours becoming airborne during renovations or building demolition. Exposure to airborne mercury is regulated under Ontario Regulation 490/09, *Designated Substances* - made under the Occupational Health and Safety Act.

All waste material must be handled and disposed of according to the Revised Regulation of Ontario 347/90 as amended – made under the Environmental Protection Act. Lead and/or Mercury waste may be subject to Leachate Criteria (Schedule 4) of this regulation.

At the time of removal or replacement of fluorescent light ballasts, the ballasts should be inspected for PCB content. All PCB materials must be handled and stored as outlined in the Revised Regulation of Ontario 362/90. In addition, requirements outlined in the federal regulation SOR/2008-273 made under the Canadian Environmental Protection Act, 2008 must be adhered to as well.

Prior to performing construction, renovations or demolition, the Occupational Health & Safety Act Section 30 (1-4) requires an inventory of all Designated Substances to be submitted to the general contractor who in turn must submit the same list to all their subtrades. Submission of this report to all parties will satisfy this requirement.

Building material(s) that are not detailed within this survey due to inaccessibility during the time of the survey and/or are uncovered during renovation/demolition activities, notably materials that are suspected to contain asbestos, should be properly assessed by a qualified person prior to their disturbance.



6.0 LIMITATIONS

In this statement of limitations, the “Client” refers to the persons or entities to whom this report is addressed. “THEM” refers to T. Harris Environmental Management Inc. The “Contract” refers to any general, or project-specific written agreement, including project-specific scope of work documents, executed between THEM and the Client pertaining to the subject matter of this report.

This report is subject to the limitations set out below and any other limitations set out in the body of this report or in the Contract between THEM and the Client.

The investigation and assessment described in this report were conducted in accordance with the Contract agreed upon by the Client in a manner consistent with a reasonable level of care and skill normally exercised by members of the occupational hygiene consulting profession currently practising under similar conditions in the Province of Ontario and observing the code of ethics of the Canadian Registration Board of Occupational Hygiene (CRBOH) and the American Board of Industrial Hygiene (ABIH).

In preparing this report, THEM has relied on information provided by others, including without limitation, information concerning the history and operation of the site, and test results and analyses of other consultants, independent laboratories, or testing services. Except as expressly stated in this report, THEM has not made any independent verification of such information. Findings cannot be extended to portions of the site, which were unavailable for direct observation.

The assessment in this report has been made in the context of regulations which were in force and effect at the time of the assessment and which are specified in this report. The assessment did not take into account any regulations, which were not in effect at the date of the assessments, or any guideline or standard not specified in this report. Regulatory standards do not exist for all materials of a potentially hazardous nature.

The collection of any samples at the site (including the location of samples and the analytical parameters applied to the samples) was undertaken in accordance with the Contract agreed upon by the Client, based upon the information provided to THEM by the Client concerning existing site conditions. Conditions between sample locations (if any) may differ from those indicated in this report.

This report is intended solely for the use or uses specified in this report and/or the Contract. Use of this report for purposes other than those set out in this report and/or the Contract will be at the sole risk of the Client.



Copying of this report except as may be reasonably required for internal use by the Client and any distribution of this report to persons other than the Client in whole or in part, is not permitted without the express written permission of THEM.

This report is for the sole use of the Client. THEM makes no representation or warranty, either expressed or implied, to any third party with regard to this report and the work referred to in this report and expressly disclaims any, and accepts no duty of care to any third party or any responsibility or liability whatsoever to any third party for any loss, expenses, damages (direct, consequential or contingent), fines, penalties, or other harm that may be suffered or incurred by any third party as a result of any use of, any reliance placed upon, or any decision made or actions taken based upon this report or the work referred to herein.

In no event shall THEM be liable for any indirect, incidental, special or consequential damages, or damages from loss of profits, revenue, or use, incurred by either the client or any third party, whether in an action in tort or contract, even if THEM has been advised of the possibility of such damages. THEM's liability for damages shall in no event exceed the limit of available insurance coverage.

If new information concerning the subject matter of this report arises, THEM should be contacted to re-evaluate the conclusions of this report and to provide amendments as required.

Sincerely,

T. HARRIS ENVIRONMENTAL MANAGEMENT INC.

Rayan Foster
Environmental/OH&S Technician

Raj Singh, P.Eng., MBA
Manager – Greater Toronto Area (GTA) and
National Capital Region (NCR)



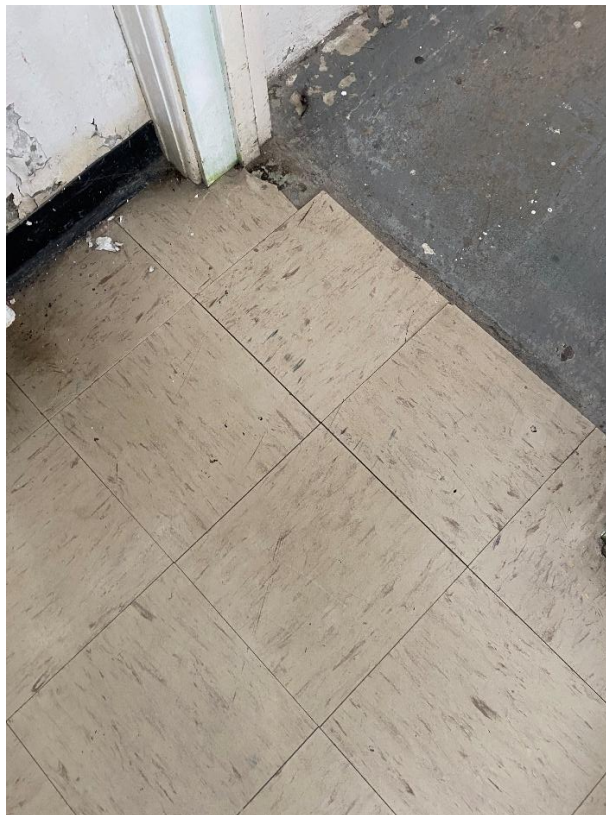
HAZARDOUS MATERIALS SURVEY
DOWNSVIEW SECONDARY SCHOOL
7 HAWKSDALE ROAD, TORONTO, ONTARIO, M3K 1W3

THEM PROJECT #52809
MARCH 2026

APPENDIX I SITE PHOTOGRAPHS



Photograph 1: View of cream paint containing high concentration of lead within Corridor (53631).



Photograph 2: View of asbestos containing vinyl floor tile within Backstage (5364).



Photograph 3: View of off-white paint containing high concentration of lead within Stage (5513).



Photograph 4: View of plaster sampling location within Stage (5513).



HAZARDOUS MATERIALS SURVEY
DOWNSVIEW SECONDARY SCHOOL
7 HAWKSDALE ROAD, TORONTO, ONTARIO, M3K 1W3

THEM PROJECT #52809
MARCH 2026

APPENDIX II
LABORATORY CERTIFICATE OF ANALYSIS



EMSL Canada Inc.

2756 Slough Street Mississauga, ON L4T 1G3
Phone/Fax: (289) 997-4602 / (289) 997-4607
<http://www.EMSL.com> / torontolab@emsl.com

EMSL Canada Order 552605247
Customer ID: 55THAR50
Customer PO: 52809
Project ID:

Attn: Rayan Foster
T. Harris Environmental Management, Inc.
93 Skyway Avenue
Suite 101
Toronto, ON M9W 6N6

Phone: (416) 679-8914
Fax: (416) 679-8915
Collected:
Received: 3/16/2026
Analyzed: 3/18/2026

Proj: Downsview SS- 52809

Summary Test Report for Asbestos Analysis of Bulk Materials for Ontario Regulation 278/05

Client Sample ID: 1.1-Block Fill **Lab Sample ID:** 552605247-0001

Sample Description: Back Stage (5364)/Block Fill

TEST	Analyzed Date	Color	Non-Asbestos		Asbestos	Comment
			Fibrous	Non-Fibrous		
PLM	3/18/2026	Gray/White/Yellow	0.0%	100.0%	None Detected	

Client Sample ID: 1.1-Mortar **Lab Sample ID:** 552605247-0001A

Sample Description: Back Stage (5364)/Block Fill

TEST	Analyzed Date	Color	Non-Asbestos		Asbestos	Comment
			Fibrous	Non-Fibrous		
PLM	3/18/2026	Gray	0.0%	100.0%	None Detected	

Client Sample ID: 1.2-Block Fill **Lab Sample ID:** 552605247-0002

Sample Description: Corridor (5363-1)/ Block Fill

TEST	Analyzed Date	Color	Non-Asbestos		Asbestos	Comment
			Fibrous	Non-Fibrous		
PLM	3/18/2026	Gray/White/Yellow	0.0%	100.0%	None Detected	

Client Sample ID: 1.2-Mortar **Lab Sample ID:** 552605247-0002A

Sample Description: Corridor (5363-1)/ Block Fill

TEST	Analyzed Date	Color	Non-Asbestos		Asbestos	Comment
			Fibrous	Non-Fibrous		
PLM	3/18/2026	Gray	0.0%	100.0%	None Detected	

Client Sample ID: 1.3-Block Fill **Lab Sample ID:** 552605247-0003

Sample Description: Stage (5513)/ Block Fill

TEST	Analyzed Date	Color	Non-Asbestos		Asbestos	Comment
			Fibrous	Non-Fibrous		
PLM	3/18/2026	White/Beige	0.0%	100.0%	None Detected	

Client Sample ID: 1.3-Mortar **Lab Sample ID:** 552605247-0003A

Sample Description: Stage (5513)/ Block Fill

TEST	Analyzed Date	Color	Non-Asbestos		Asbestos	Comment
			Fibrous	Non-Fibrous		
PLM	3/18/2026	Gray	0.0%	100.0%	None Detected	

Client Sample ID: 2.1-Joint Compound **Lab Sample ID:** 552605247-0004

Sample Description: Stage (5513)/ Plaster

TEST	Analyzed Date	Color	Non-Asbestos		Asbestos	Comment
			Fibrous	Non-Fibrous		
PLM	3/18/2026	Beige	0.0%	100.0%	None Detected	



EMSL Canada Inc.

2756 Slough Street Mississauga, ON L4T 1G3
Phone/Fax: (289) 997-4602 / (289) 997-4607
<http://www.EMSL.com> / torontolab@emsl.com

EMSL Canada Order 552605247
Customer ID: 55THAR50
Customer PO: 52809
Project ID:

Summary Test Report for Asbestos Analysis of Bulk Materials for Ontario Regulation 278/05

Client Sample ID: 2.1-Skim Coat **Lab Sample ID:** 552605247-0004A

Sample Description: Stage (5513)/ Plaster

TEST	Analyzed Date	Color	Non-Asbestos		Asbestos	Comment
			Fibrous	Non-Fibrous		
PLM	3/18/2026	White	0.0%	100.0%	None Detected	

Client Sample ID: 2.1-Rough Coat **Lab Sample ID:** 552605247-0004B

Sample Description: Stage (5513)/ Plaster

TEST	Analyzed Date	Color	Non-Asbestos		Asbestos	Comment
			Fibrous	Non-Fibrous		
PLM	3/18/2026	Gray/White	0.0%	100.0%	None Detected	

Client Sample ID: 2.2-Joint Compound **Lab Sample ID:** 552605247-0005

Sample Description: Stage (5513)/ Plaster

TEST	Analyzed Date	Color	Non-Asbestos		Asbestos	Comment
			Fibrous	Non-Fibrous		
PLM	3/18/2026	White	0.0%	100.0%	None Detected	

Client Sample ID: 2.2-Skim Coat **Lab Sample ID:** 552605247-0005A

Sample Description: Stage (5513)/ Plaster

TEST	Analyzed Date	Color	Non-Asbestos		Asbestos	Comment
			Fibrous	Non-Fibrous		
PLM	3/18/2026	White	0.0%	100.0%	None Detected	

Client Sample ID: 2.2-Rough Coat **Lab Sample ID:** 552605247-0005B

Sample Description: Stage (5513)/ Plaster

TEST	Analyzed Date	Color	Non-Asbestos		Asbestos	Comment
			Fibrous	Non-Fibrous		
PLM	3/18/2026	Gray/White	0.0%	100.0%	None Detected	

Client Sample ID: 2.3-Joint Compound **Lab Sample ID:** 552605247-0006

Sample Description: Stage (5513)/ Plaster

TEST	Analyzed Date	Color	Non-Asbestos		Asbestos	Comment
			Fibrous	Non-Fibrous		
PLM	3/18/2026	Beige	0.0%	100.0%	None Detected	

Client Sample ID: 2.3-Skim Coat **Lab Sample ID:** 552605247-0006A

Sample Description: Stage (5513)/ Plaster

TEST	Analyzed Date	Color	Non-Asbestos		Asbestos	Comment
			Fibrous	Non-Fibrous		
PLM	3/18/2026	White	0.0%	100.0%	None Detected	

Client Sample ID: 3.1-Block Fill **Lab Sample ID:** 552605247-0007

Sample Description: Ack Stage (5364)/ Block Mortar

TEST	Analyzed Date	Color	Non-Asbestos		Asbestos	Comment
			Fibrous	Non-Fibrous		
PLM	3/18/2026	Gray/White/Yellow	0.0%	100.0%	None Detected	



EMSL Canada Inc.

2756 Slough Street Mississauga, ON L4T 1G3
Phone/Fax: (289) 997-4602 / (289) 997-4607
<http://www.EMSL.com> / torontolab@emsl.com

EMSL Canada Order 552605247
Customer ID: 55THAR50
Customer PO: 52809
Project ID:

Summary Test Report for Asbestos Analysis of Bulk Materials for Ontario Regulation 278/05

Client Sample ID: 3.1-Mortar

Lab Sample ID: 552605247-0007A

Sample Description: Ack Stage (5364)/ Block Mortar

TEST	Analyzed Date	Color	Non-Asbestos		Asbestos	Comment
			Fibrous	Non-Fibrous		
PLM	3/18/2026	Gray	0.0%	100.0%	None Detected	

Client Sample ID: 3.2

Lab Sample ID: 552605247-0008

Sample Description: Corridor (5363-1)/ Block Mortar

TEST	Analyzed Date	Color	Non-Asbestos		Asbestos	Comment
			Fibrous	Non-Fibrous		
PLM	3/18/2026	Brown/Gray	0.0%	100.0%	None Detected	

Client Sample ID: 3.3-Block Fill

Lab Sample ID: 552605247-0009

Sample Description: Corridor (5363-1)/ Block Mortar

TEST	Analyzed Date	Color	Non-Asbestos		Asbestos	Comment
			Fibrous	Non-Fibrous		
PLM	3/18/2026	Beige	0.0%	100.0%	None Detected	

Client Sample ID: 3.3-Mortar

Lab Sample ID: 552605247-0009A

Sample Description: Corridor (5363-1)/ Block Mortar

TEST	Analyzed Date	Color	Non-Asbestos		Asbestos	Comment
			Fibrous	Non-Fibrous		
PLM	3/18/2026	Gray	0.0%	100.0%	None Detected	

Analyst(s):

Diana Costantino PLM (6)
Olivia Zeppieri PLM (13)

Reviewed and approved by:

Matthew Davis or other approved signatory
or Other Approved Signatory

None Detected = <0.1%. EMSL maintains liability limited to cost of analysis. Interpretation and use of test results are the responsibility of the client. This is a summary report; official reports are available on LabConnect or upon request and relates only to the samples reported above, and may not be reproduced, except in full, without written approval by EMSL. EMSL bears no responsibility for sample collection activities or analytical method limitations. The report reflects the samples as received. Results are generated from the field sampling data (sampling volumes and areas, locations, etc.) provided by the client on the Chain of Custody. Samples are within quality control criteria and met method specifications unless otherwise noted. The above analyses were performed in general compliance with Appendix E to Subpart E of 40 CFR (previously EPA 600/M4-82-020 "Interim Method") but augmented with procedures outlined in the 1993 ("final") version of the method. This report must not be used by the client to claim product certification, approval, or endorsement by NVLAP, NIST or any agency of the federal government. Non-friable organically bound materials present a problem matrix and therefore EMSL recommends gravimetric reduction prior to analysis. Unless requested by the client, building materials manufactured with multiple layers (i.e. linoleum, wallboard, etc.) are reported as a single sample. Estimation of uncertainty is available on request.

Samples analyzed by EMSL Canada Inc. Mississauga, ON NVLAP Lab Code 200877-0

Initial report from: 03/18/2026 12:06:23

**EMSL Canada Inc.**

2756 Slough Street, Mississauga, ON L4T 1G3

Phone/Fax: (289) 997-4602 / (289) 997-4607

<http://www.EMSL.com>torontolab@emsl.com

EMSL Canada Or 552605251
CustomerID: 55THAR50
CustomerPO: 52809
ProjectID:

Attn: **Ryan Foster**
T. Harris Environmental Management, Inc.
93 Skyway Avenue
Suite 101
Toronto, ON M9W 6N6

Phone: (416) 679-8914
Fax: (416) 679-8915
Received: 3/16/2026 04:40 PM
Collected:

Project: **Downsview SS - 52809****Test Report: Lead in Paint Chips by Flame AAS (SW 846 3050B/7000B)***

<i>Client Sample</i>	<i>Description</i>	<i>Collected</i>	<i>Analyzed</i>	<i>Weight</i>	<i>RDL</i>	<i>Lead Concentration</i>
L1			3/17/2026	0.2543 g	0.032 % wt	1.4 % wt
552605251-0001	Site: Off-White Paint / Stage (5513)					
L2			3/17/2026	0.2508 g	0.032 % wt	1.4 % wt
552605251-0002	Site: Cream Paint / Corridor (5363-1)					

Rowena Fanto, Lead Supervisor
or other approved signatory

EMSL maintains liability limited to cost of analysis. Interpretation and use of test results are the responsibility of the client. This report relates only to the samples reported above, and may not be reproduced, except in full, without written approval by EMSL. EMSL bears no responsibility for sample collection activities or analytical method limitations. The report reflects the samples as received. Results are generated from the field sampling data (sampling volumes and areas, locations, etc.) provided by the client on the Chain of Custody. Samples are within quality control criteria and met method specifications unless otherwise noted. * Analysis following Lead in Paint by EMSL SOP/Determination of Environmental Lead by FLAA. Reporting limit is 0.0064% wt based on the minimum sample weight per our SOP. "<" (less than) result signifies the analyte was not detected at or above the reporting limit. Measurement of uncertainty is available upon request. Definitions of modifications are available upon request.

Samples analyzed by EMSL Canada Inc. Mississauga, ON AIHA LAP, LLC-ELLAP Accredited #196142

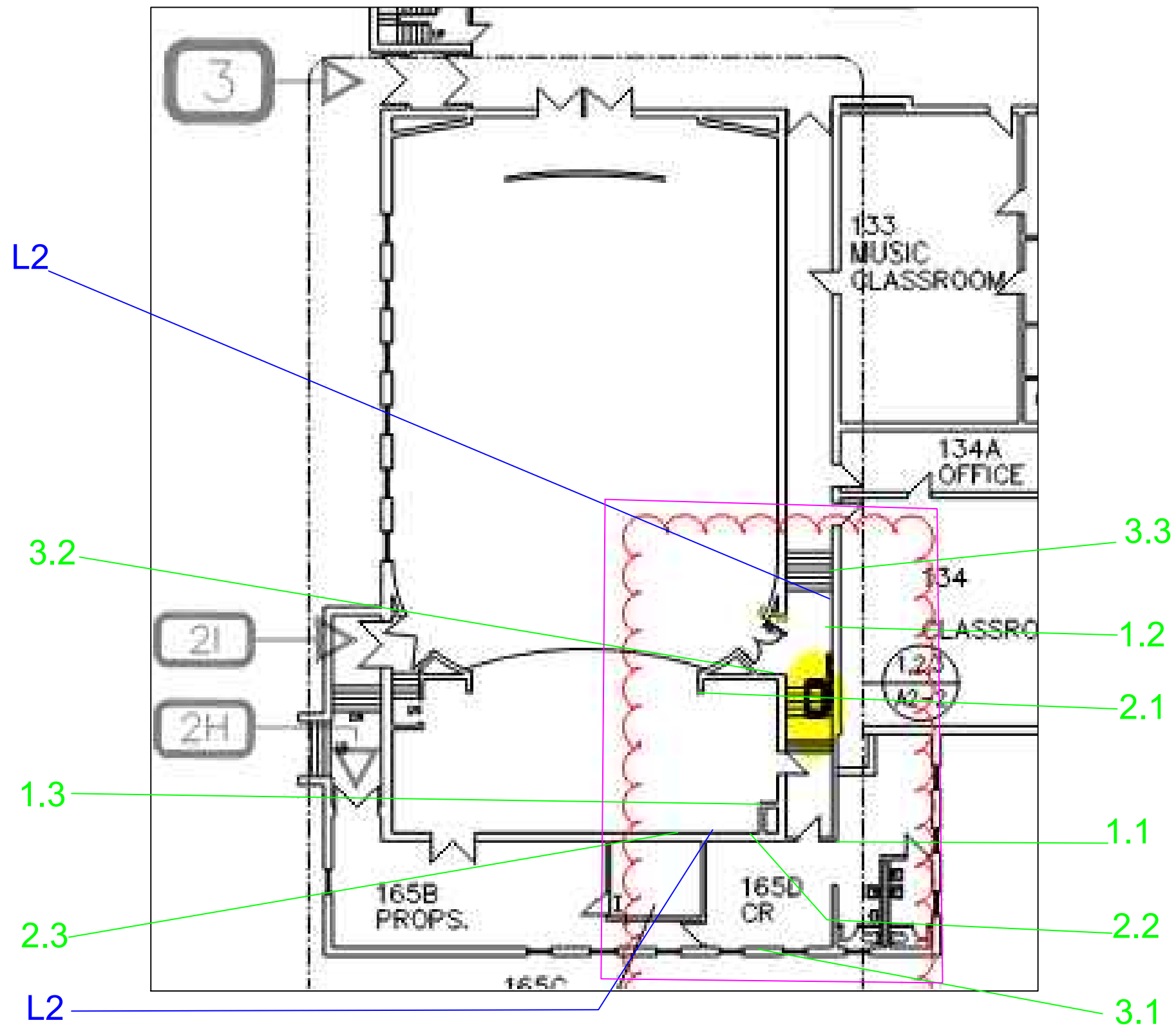
Initial report from 03/18/2026 14:29:13



HAZARDOUS MATERIALS SURVEY
DOWNSVIEW SECONDARY SCHOOL
7 HAWKSDALE ROAD, TORONTO, ONTARIO, M3K 1W3

THEM PROJECT #52809
MARCH 2026

**APPENDIX III
SITE DRAWINGS**



LEGEND



Project Specific Area

■ Negative Asbestos Sampling Locations

■ Lead Sampling Locations

■ Positive Asbestos Sampling Locations

NOTE:
Original floor plan was not created by
T. Harris



93 Skyway Avenue, Suite 101, Toronto, Ontario M9W 6N6
1-800-ASK-THEM www.tharris.ca

THEM PROJECT NUMBER: T26-52809

PROJECT NAME: TDSB Downsview SS Accessibility Upgrade DSS

LOCATION: 7 Hawksdale Road, Toronto, Ontario, M3K 1W3

DRAWING NAME:
Hazardous Materials Bulk Sampling Locations

DRAWING DATE: March 18, 2026

SCALE: NTS

DRAWING LOCATION: First Floor

DRAWN BY: AS

[illegible]