



# **S P E C I F I C A T I O N S**

for

**ST. ANNE KITCHENER CES RENOVATIONS  
RFT 2026-10**

**250 EAST AVE., KITCHENER, ONTARIO, CANADA  
+VG PROJECT NO. 22584**

for the

**WATERLOO CATHOLIC DISTRICT SCHOOL BOARD**

**March 2026**

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**+VG ARCHITECTS**

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**End of Section**

## 1.1 INVITATION

### .1 Bid Call

#### .1 REGISTERED SUPPLIERS/BIDDERS

- All Bidders shall have a Bidding System Vendor account and be registered as a Plan Taker for this Bid opportunity, which will enable the Bidder to download the Bid Call Document, to receive Addenda email notifications and download all documents without the watermark “preview” on them.
- To ensure receipt of the latest information and updates via email regarding this bid, or if a Bidder has obtained this Bid Document from a third party, the onus is on the Bidder to create a Bidding System Vendor account and be register as a Plan Taker for the bid opportunity.

### .2

ELECTRONIC BID SUBMISSIONS ONLY, shall be received by the Bidding System. Hardcopy submissions are not permitted.

Bidders are cautioned that the timing of their Bid Submission is based on when the Bid is RECEIVED by the Bidding System, not when a Bid is submitted, as Bid transmission can be delayed due to file transfer size, transmission speed, etc.

For the above reasons, it is recommended that sufficient time to complete your Bid Submission and to resolve any issues that may arise. The closing time and date shall be determined by the Bidding System’s web clock.

Bidders should contact bids&tenders support listed below, at least twenty-four (24) hours prior to the closing time and date, if they encounter any problems. The Bidding System will send a confirmation email to the Bidder advising that their bid was submitted successfully. If you do not receive a confirmation email, contact bids&tenders support at [support@bidsandtenders.ca](mailto:support@bidsandtenders.ca).

Late Bids are not permitted by the Bidding System.

To ensure receipt of the latest information and updates via email regarding this bid, or if a Bidder has obtained this Bid Document from a third party, the onus is on the Bidder to create a Bidding System Vendor account and register as a Plan Taker for the bid opportunity.

Supplementary Form of Tender to be emailed to:  
[Stephen.butterworth@wcdsb.ca](mailto:Stephen.butterworth@wcdsb.ca)

- .3 Submissions to the bidding system will be on or before 2:00:00pm April 15, 2026, local time and Followed by the Supplementary Form of Tender emailed to [Stephen.butterworth@wcdsb.ca](mailto:Stephen.butterworth@wcdsb.ca) at 3:00:00 pm April 15, 2026 local time.
- .4 Instructions for tendering must be followed implicitly. Any Tender which does not comply with the *CCDC 2-2020 Stipulated Price Contract, Supplementary Conditions, as attached*, and the Instructions to Bidders may be declared informal and may not be considered.

- .5 Stipulated sum tenders, submitted on the Form of Tender supplied, on the Work described in the following specifications and/or shown on the accompanying drawings, including all Addenda issued prior to the closing of Tender.
- .6 ALL BLANKS IN THE FORM OF TENDER, INCLUDING SUPPLEMENTAL FORM OF TENDER, SHALL BE FULLY COMPLETED OR THE TENDER MAY BE INVALIDATED. TENDERS NOT COMPLETED IN FULL, MAY, AT THE DISCRETION OF THE BOARD, BE REJECTED. IF A BLANK IS DEEMED TO BE NOT REQUIRED BY THE BIDDER, COMPLETE WITH A "NOT APPLICABLE (N/A)", "OWN FORCES", ETC.
- .7 Tenders shall be valid for sixty (60) Calendar Days from the date of closing above.
- .8 Tenders must note, and include, on a separate form, any "Separate Prices" requested by the Consultant; any "Alternate Prices to the Base Bid" requested by the Consultant; any "Supplementary Alternate Prices" proposed by the Bidder; as well as all Unit Prices indicated on the *Supplementary Form of Tender*. Tender award to be based on low bid as specified.
- .9 Tender award will be determined based on low Bid as specified.

## 1.2 INTENT

- .1 Intent of this Bid call is to obtain an offer to perform work to complete the construction of **St. Anne Catholic Elementary School** located at 250 East Ave., Kitchener, ON for a Stipulated Price contract, in accordance with Contract Documents.

## 1.3 CONTRACT/BID DOCUMENTS

- .1 Agreement Form
- .2 Definitions
  - .1 Contract Documents: Defined in the *CCDC 2-2020* Stipulated Price Contract, Definitions.
  - .2 Bid Documents: Contract Documents supplemented with Instructions to Bidders, Project Information, Soils Investigation Data, Form of Tender, and Supplementary Form of Tender identified herein.
  - .3 Bid, Offer, or Bidding: Act of submitting an offer under seal or signed under witness.
  - .4 Bid Price: Monetary sum identified in Bid Form as an offer to perform work.
- .3 Availability

To obtain documents online please visit <https://wcdsb.bidsandtenders.ca/>. You can preview the bid documents with a Preview Watermark prior to registering for the opportunity.

  - .1 Documents are not provided in any other manner.
  - .2 Documents are made available only for purpose of obtaining offers for this project. Their use does not confer license or grant for other purposes.
  - .3 A copy of soils investigation report may be found in Bid Documents
- .4 Examination

- .1 Upon receipt of Bid Documents verify that documents are complete.
- .2 Immediately notify, through the bidding system "Submit a Question", upon finding discrepancies or omissions in Bid Documents.
- .5 Queries/Questions
  - .1 Questions related to this bid are to be submitted to the Purchasing representative through the Bidding System only by clicking on the "Submit a Question" button for this specific bid opportunity.

Purchasing Representative

Stephen Butterworth  
Purchasing Officer  
Waterloo Catholic District School Board

Email: Stephen.Butterworth@wcdsb.ca

Neither the Board nor the Board contact will be responsible for any verbal instructions or clarifications given during the Bidding process. As a result, verbal recollections of discussions, meetings, or telephone conversations will not be considered valid.

- .6 Addendums
  - .1 Bidders shall acknowledge receipt of any addenda through the Bidding System by checking the box for each addenda and any applicable attachment.

It is the responsibility of the Bidder to have received all Addenda that are issued. Bidders should check online at <https://wcdsb.bidsandtenders.ca/> prior to submitting their Bid and up until Bid closing time and date in the event additional addenda are issued.

If a Bidder submits their bid prior to the Bid closing time and date and addenda have been issued, the Bidding System shall WITHDRAW the Bid submission and the bid status will change to an INCOMPLETE STATUS and Withdraw the Bid. The Bidder can view this status change in the "MY BIDS" section of the Bidding System.

The Bidder is solely responsible to:

- make any required adjustments to their Bid; and
  - acknowledge the addenda; and
  - Ensure the re-submitted Bid is RECEIVED by the Bidding System no later than the stated bid closing time and date.
- .2 Clarifications requested by bidders must be received by the bidding system, not less than nine (9) days before date set for receipt of Bids. Reply will be in form of an addendum, a copy of which will be forwarded to known bidders no later than seven (7) working days before receipt of Bids
  - .7 Product/System Options
    - .1 There are two opportunities for a Bidder to identify Alternates in the Bidder's Tender. The first method is to identify Alternates at the time of the Tender

submission on the *Supplementary Form of Tender* to be attached to the Form of Tender. This document is to be entitled ALTERNATE PRICES TO BASE BID:

- .1 Wherever possible or practical, the specifications are written on a “Base Bid” principle. When “Base Bid” product or service is identified, a number of “alternates” have been listed. The Bidder must tender on the “Base Bid” and indicate, on a separate sheet, Alternates and a credit to the Contract if one of the specified alternate supplier/manufacturer/installer or material/method of construction is being proposed by the Bidder. Only those identified Alternates in the Specification may be listed on the *Supplementary Form of Tender*. If the Specification identifies a “Base Bid” with a number of Alternates and the Bidder does not identify on the *Supplementary Form of Tender* any of the indicated Alternates with a credit, then the Contractor shall provide, in all instances, the “Base Bid” supplier/manufacturer/installer or material/method of construction.
- .2 The Contractor shall accept full responsibility that a proposed Alternate will not exceed space requirements as indicated on the drawings and that coordination of the Contractor’s own and related work and cost of installation is included in the Contractor’s work. Approved alternate products or assemblies shall comply with all technical and design requirements specified in the “Base Bid”. (E.g. materials, gauge, finish, colour, size, fit, mounting, strength, durability, operation and warranty.) If any additional design fee, either Architectural or Engineering, is required due to a change or substitution requested by the Contractor, the cost of such fee must be paid by the Contractor.
- .2 The second method is to identify alternates on the *Supplementary Form of Tender* and submitted, as requested by the Consultant, at the time of Tender. This document is to be entitled. SUPPLEMENTARY ALTERNATE PRICES:
  - .1 Mechanical and Electrical Alternates may be submitted on the *Supplementary Form of Tender*.
  - .2 If proposals for alternates (not already identified as alternates in the specification) are submitted by the Contractor to the Consultant during the tender period in sufficient time to allow for analysis and the issuance of an Addendum to include the proposals, then such proposal may be included in the Form of Tender under *Separate Prices*.
  - .3 Proposed alternates which are not covered by an Addendum and listed in the Form of Tender under *Separate Prices*, may be considered if the proposed entitled *Supplementary Alternate Prices* accompanies the *Supplementary Form of Tender* as a separate document on which the Alternate is completely specified and described, and on which is given the reason for substitution.
  - .4 Any proposed alternates or in lieu of prices will not necessarily be accepted.
  - .5 The Contractor shall accept full responsibility that a proposed Alternate will not exceed space requirements as indicated on the drawings and that coordination of his own and related work and cost of installation is included in his work. Approved alternate products or assemblies shall comply with all technical and design requirements specified in the “Base Bid”. (E.g. materials, gauge, finish, colour, size, fit, mounting, strength, durability,

operation and warranty.) If any additional design fee, either Architectural or Engineering, is required due to a change or substitution requested by the Contractor, the cost of such fee must be paid by the Contractor.

- .6 Unless substitutions are submitted in this manner and subsequently accepted, provide products as specified.

#### 1.4 OWNER

- .1 The Owner of the Project is:

WATERLOO CATHOLIC DISTRICT SCHOOL BOARD  
35 Weber Street West, Unit A  
Kitchener, Ontario N2H 3Z1  
Phone: (519) 578-3660

#### 1.5 CONSULTANT

- .1 The Architect on this Project is:

+VG Architects (The Ventin Group Ltd)  
50 Dalhousie Street  
Brantford, ON  
T: (519) 754-1652  
[www.plusvg.com](http://www.plusvg.com)

E-mail

(Direct questions by E-MAIL to the office of [eschuck@plusvg.com](mailto:eschuck@plusvg.com))

#### 1.6 SUB CONSULTANTS

- .1 The Structural Engineer for this Project is:

+VG Structural (The Ventin Group Ltd)  
50 Dalhousie Street  
Brantford, ON  
T: (519) 754-1652  
[www.plusvg.com](http://www.plusvg.com)

- .2 The Mechanical Consultant on this Project is:

Smith + Andersen  
148 Fullarton St., Suite 1400  
London, ON  
T: 519-963-8888  
[www.smithandandersen.com](http://www.smithandandersen.com)

- .3 The Electrical Consultant on this Project is:

Smith + Andersen  
148 Fullarton St., Suite 1400  
London, ON  
T: 519-963-8888  
[www.smithandandersen.com](http://www.smithandandersen.com)

**1.7 PREQUALIFIED GENERAL CONTRACTORS AND SPECIFIC TRADES**

- .1 The following General Contractors and Specific Trades have been prequalified by the Board to bid on the work included in this Tender **as per the WCDSB – 2019-24 Mechanical, Electrical, and General Contractors.**

**NOTE:** This Tender can be tendered by **prequalified General Contractors and Specific Trades ONLY. Tenders received from non-prequalified General Contractors and Specific Trades will not be considered.**

**GENERAL CONTRACTORS**

CRD Construction Gateman Milloy Reid and Deleye Pre Eng Contractors STM Construction Melloul Blamey Gordner Construction Dakon Construction Elgin Contracting TRP Construction PM Contracting Devlan Construction Tambro Construction Sax Construction Percon Construction Everstrong Construction Spec Construction	Nith Valley Construction Norlon Builders Golden Gate Contracting Brook Restoration Harrington Construction Genpro Contracting J.R. Certus Harbridge and Cross Ritestart Ltd M J Dixon Construction AEC Developments Renokrew Zehr Levesque Inc. Aviero Hall Construction S.G. Cunningham
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**MECHANICAL TRADES**

Aim Industrial Inc. Dependable Mechanical Sys. Arcadian Projects Jay Stewart Mechanical Conestoga Mechanical JTS Mechanical Roberts Onsite Dean Lane CEC Mechanical	L.J. Barton Mechanical Chamberlain Building Serv. Soan Mechanical Linde Mechanical JMR Electric Velocity Mechanical Brenner Mechanical Kittel Mechanical Superior Boiler Works
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**ELECTRICAL TRADES**

Kraun Electric Inc. Aim Industrial Inc. Powerserve Inc. PHE Contractor Roberts Onsite T. Lloyd Electric	Group L.J. Barton Mechanical Energy Network Services Superior Boiler Works Chamberlain Building Serv. RBT Electrical CEC Services Ltd.
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Juno Electric Comtrade Ltd MJM Electric Trade Service Group	JMR Electric B Safe Electric Ltd Arcadian Projects Millers Electric
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## 1.8 SITE ASSESSMENT

### .1 Site Examination

- .1 Visit project site and surrounding area before submitting Bid.
- .2 Notwithstanding the responsibility, a Non-Mandatory Site Visit to project site has been arranged for General Contractors and their sub-trades as follows:
- .3 Recommended, non-mandatory site visit: St. Anne Catholic Elementary School, 250 East Ave, Kitchener on Wednesday April 8, 2026, 9:30 a.m.
- .4 Meet at Main Entrance to school.
- .5 Before tendering, the Bidder shall examine the site, and the Reports prepared by separately engaged Consultants, bound into the Specifications for reference only, and shall ascertain the extent and nature of the materials it may be necessary, and shall be sure that the Bidder's determinations are made in accordance with the drawings and specifications and the Reports.
- .6 Proposals shall include the cost imposed by existing conditions and limitations of site and the accepted proposal shall be held to have included such costs. NO ALLOWANCE WILL BE MADE FOR FAILURE TO EXAMINE THE EXISTING SITE.
- .7 The information shown on the drawings are furnished in good faith for the guidance of the Contractor, but shall in no way relieve the Contractor of the responsibility of ascertaining to the Contractor's own satisfaction the nature of all conditions at the site.

## 1.9 BID ENCLOSURES/REQUIREMENTS

### .1 Security Deposit

- .1 Each tender shall be accompanied by a Bid Bond and Agreement to Bond in the most recent form approved by the Canadian Construction Association from a Surety Company, acceptable to the Board. The Bid Bond shall be in the amount of [...10% of Base Bid...], together with an Agreement to Bond. The Bid Bond must be valid for a minimum of sixty (60) Calendar Days from the closing date. Tenders not accompanied by a Bid Bond and Agreement to Bond will be declared informal.
- .2 This Bid Bond shall be forfeited if the bidder declines to enter into a formal contract in the amount tendered, or as adjusted according to the separate prices included in the tender, and/or to furnish, when called upon to do so, a Performance Bond. This Bid Bond shall be accompanied by an Agreement from the Surety Company that a 50 % Performance Bond and a 50 % Labour and Material Payment Bond will be issued to the Bidder if the Bidder is awarded the contract. The cost of the Bonds shall be included in the amount of the Tender. Refer to the *CCDC 2-2020 Stipulated Price Contract and the Supplementary Conditions, as attached*, for further information.
- .3 Retention and use of the Bid Bond, as outlined above, shall not be deemed a penalty, but a consideration to the Board for inviting and considering the

- Tender and as part payment for sustained damages and costs incurred by the Board, which shall be deemed to be the difference between the bid price of this Bidder and the bid price of the next lowest Bidder acceptable to the Board.
- .4 A Performance Bond, equal to 50 % of the contract price, shall be furnished through a Surety Company or Insurance Company approved by the Consultant and the Board according to terms and conditions acceptable to the Board and the Consultant.
  - .5 On completion of the work, the Performance Bond shall remain in force as a MAINTENANCE BOND for a period of one (1) year from the date of acceptance of the building by the Board. It shall form a guarantee of workmanship and materials for the one (1) year period.
  - .6 Use latest edition CCDC approved bond forms.
- .2 Performance Assurance
- .1 The Bidder to whom the contract is awarded must properly sign the contract and furnish a satisfactory Performance Bond, Labour and Material Payment Bond, Insurance Certificate and Workers' Compensation Board Certificate within ten (10) Working Days of acceptance of the tender by the Board, or forfeit the Bid Bond.
  - .2 Labour and Material Payment Bond, equal to 50 % of contract, to be provided within ten (10) Working Days, stating that the Board will not be held responsible if payment to subcontractors, as certified due by the Consultant, is not made by the General Contractor when due.
  - .3 Tenders must include all costs involved in having the contract "Fit for Legal Occupancy and Substantial Performance" by Friday, August 28, 2026 and having the entire building Totally Completed by Monday, September 7, 2026.
  - .4 Persons or firms submitting tender proposals shall be actually engaged as their recognized business in the lines of work required by the specifications, and shall be able to refer to work of a similar character which has been satisfactorily performed by them.
- .3 Fees for Changes in Work
- .1 It must be clearly understood that the Board cannot accept any price variation in the supply or installation of products or labour or materials from those submitted and carried by the Contractor at the time of tender. During the contract period, the Board will not be responsible for, or entertain any price increase in the cost of materials or labour carried in the tender amount.
  - .2 The tender amount shall not include Harmonized Sales Taxes but shall include all other applicable excise taxes, custom duties, freight, exchange and all other charges in effect and known to come into effect during the construction work described in this Contract.
  - .3 Unit Prices are exclusive of Harmonized Sales Taxes.
  - .4 The successful Bidder must provide the Bidder's H.S.T. (Tax) Registration Number and each request for payment must show this number and the amount of H.S.T.(Tax) payable.
  - .5 At the time of tender submission, include *Separate Prices* listed in the Supplemental Form of Tender for the identified items. Express each In Lieu of Price as a Credit or an Extra to the amount tendered. Contract Amount will be

adjusted consistent with their acceptance or rejection by the Board. Separate Prices DO NOT include H.S.T.

.4 Unit Prices

- .1 UNIT PRICES FOR ADDITIONAL WORK SHALL NOT EXCEED UNIT PRICES FOR DEDUCTED WORK BY MORE THAN 20%.
- .2 Unit prices must be submitted at time of Tender.
- .3 The Board reserves the right to accept or reject any or all of the unit prices prior to entering into a contract.
- .4 The Board reserves the right to negotiate any or all of the unit prices with the low Bid Contractor prior to signing a contract
- .5 Refer to *CCDC 2-2020 Part 6 CHANGES IN THE WORK* regarding valuation of changes not covered by Unit Prices.

.5 Subcontractors

- .1 Bidders are required to submit the list of subcontractors. The list is to be submitted with tender, on the *Supplemental Form of Tender* included in the Contract Documents. The Bidder shall name in these lists the subcontractors proposed to perform the work under the contract. No substitutions to these lists shall be made without the written approval of the Consultants.
- .2 The selection of Subcontractors must be acceptable to the Board and to the Consultants. If the required substitution of a Subcontractor affects the sub-tender price, an adjustment will be made in the amount of the General Contract by the amount only of the difference in sub-tenders, without additional overhead or profit to the Contractor.
- .3 If the Bidder proposes to do work with persons directly employed by the Bidder and not subcontract, then the Bidder shall insert the words "*Own Forces*" provided the Bidder can submit proof that the Bidder's forces have had previous experience in this field.
- .4 Subcontractors shall be actually engaged as their own recognized business, in the line of work required by the specifications and shall carry out themselves the work which they are awarded by subcontract. They shall not be permitted to re-subcontract their work or portions thereof, to other contractors.

.6 Fair Wage and Labour

- .1 Rate of wages, hours and conditions of work shall be in accordance with Provincial Codes and as generally recognized and accepted in the locality. Building mechanics and labourers resident in the district are to be employed where suitable.

.7 Discrepancies and Omissions

- .1 Bidders, including subcontractors, finding specified items unavailable, finding discrepancies in, or omissions from, the drawings or specifications or other contract documents, or having any doubt as to the intent or meaning of any part thereof, shall at once notify the Consultant in writing, who will issue an Addendum to all bidders in explanation of the inquiry if necessary.
- .2 All definitions, explanations, corrections or additional information will be issued by the Consultant during the time of bidding in the form of typewritten addenda and such addenda will be available to all Bidders. These shall become part of

the contract documents and **must** be shown on the Form of Tender as having been received.

.3 NO ORAL INSTRUCTIONS WILL BE VALID.

.8 Bidding Assumptions

.1 All bids submitted, are assumed to be based upon the complete set of Bid Documents.

.9 Errors in Tender

.1 The Board shall not entertain requests for gratuitous payments arising from errors alleged to have been made in a tender which the Board has accepted

.10 Building Permit

.1 Building Permit has been applied for by the Consultant and shall be paid for by the Board.

.2 The Contractor must, however, pay all other necessary fees, deposits and charges related to Municipal, Provincial and Federal Requirements. The General Contractor is responsible for determining the amounts of these permits, fees, etc.

.11 Contract Documents

.1 The Contract shall be subject to the Requirements of the *CCDC 2-2020* Stipulated Price Contract and the Supplementary Conditions, as attached. The successful Bidder must sign the *CCDC 2-2020* Stipulated Price Contract as amended by the Supplementary Conditions using this document and these specifications and drawings, within ten (10) Working Days of notification of award. Failure to do so may result in termination of the award. The Contractor shall not be entitled to any payment until this document is signed.

.2 All Contractors will be held to have examined and made themselves familiar with the various articles of these Standard Documents and shall be as binding for all sections of the following specifications as though written in full therein.

## 1.10 OFFER ACCEPTANCE/ REJECTION

.1 Privilege and Waiver of Non-Compliance

.1 Notwithstanding anything elsewhere herein set out, the lowest or any proposal will not necessarily be accepted by the Board, and the Board reserves the right in its sole discretion to reject any and all proposals at any time or to accept any proposal which is considered advantageous by the Board. Proposals which are non-compliant with the requirements of this Tender, or which contain qualifying conditions, may be disqualified or the Board may waive any non-compliance with the Tender documents, and in its sole discretion, retain for consideration proposals which are non-conforming or non-compliant.

.2 Acceptance of Offer

.1 It must be clearly understood that the final acceptance of this contract is subject to approvals of the Board and other bodies and these may delay final approval. There will be no adjustments in the tendered price for a period of sixty (60) Calendar Days from receipt of Tenders due to delays resulting from obtaining necessary approvals.

- .3 No Change in Pricing
  - .1 It must be clearly understood that the Board cannot accept any price variation in the supply or installation of products or labour or materials from those submitted and carried by the Contractor at the time of tender. During the contract period, the Board will not be responsible for, or entertain any price increase, in the cost of materials or labour carried in the tender amount for any reason, including acts of war or world events.
- .4 Withdrawl of Bids.
  - .1 Bidders may edit or withdraw their Bid Submission prior to the closing time and date. However, the Bidder is solely responsible to ensure the re-submitted bid is received by the Bidding System no later than the stated closing time and date.

Bids by hardcopy, telephone, email, or fax will not be accepted.

#### 1.11 SPECIFICATION MANUAL AND INSPECTIONS

- .1 The Bidder must be aware that the Board has instructed the Consultant to prepare a painting specification based upon the *Painting Architectural Specification Manual* prepared by the Ontario Painting Contractors' Association, 211 Consumers Road, Suite 305, Willowdale, ON, M2J 4G8
- .2 The Specification consists of three main components
  - .1 Evaluation and Choice of Systems – Surface Preparation
  - .2 Approved Product/Manufacture Listing – Specification Guide
  - .3 Inspection and Guarantee Program
  - .4 Refer to the specifications for the first two components listed above. The Inspection Procedure will be complied with in every respect by the successful General Contractor and the Painting Contractor as follows:
    - .1 Upon issuance of a subcontract to the Painting Contractor, the General Contractor shall fill out our “*Request for Assignment of an Inspector*” Form. The Inspection fee, which is a percentage charge of the painting subcontract price, will be paid from the *Allowances* identified in the General Instructions. Provide a copy of the properly executed Inspector Form to the Consultant and confirm the accuracy of the subcontractor’s painting bid.
  - .5 The Form will contain the following information:
    - .1 Name of Contractor
    - .2 Name and Description of Project
    - .3 Name and Address of the Architect
    - .4 Job Location
    - .5 Project starting date
    - .6 Contract Price
    - .7 Commencement Date of painting.
- .6 The Association will assign an Inspector to the project.

- .3 The Painting Contractor must advise the Association office of the actual starting date of painting. Painting shall not commence until the Association has been notified and the Inspector makes the initial site visit.
- .4 The Painting Contractor must supply the Inspector with a schedule of materials intended for use on the job at the commencement of the painting.
- .5 During the painting application the frequency of inspections will be sufficient to ensure adequate Quality Control procedures in accordance with the Painting *Architectural Specification Manual* and the Specifications.
- .6 The Inspector will use Interim Inspection Reports during the Project. One copy of each of these reports will be given to the Painting Contractor, one copy to the General Contractor, and two copies to the Association office, one of which will be forwarded to the Consultant. On completion of the job, the final Inspection Report will be made and routed as noted.
- .7 The Inspector will be required to check for proper preparation of surfaces, specified number of coats, as specified in the Specifications and drawings.
- .8 Any deficiencies must be corrected before the Guarantee is issued and final payment for painting made by the Board.
- .9 The Guarantee must cover making good any defects in painting and decorating due to faulty workmanship or defective materials supplied by the Painting and Decorating Subcontractor which appear during a two year period, following "substantial" completion of the Contract or the date of "Fit for Occupancy", whichever occurs first.

**1.12 MILLWORK SPECIFICATIONS AND INSPECTIONS OR ANY OTHER SPECIFICATIONS REQUIRED BY THE APPROPRIATE CONSULTANTS**

**1.13.0 COMPLIANCE WITH LAWS, REGULATION**

- 1.13.1 In the performance of its obligations under the contract awarded (if any), the successful Respondent shall, at its own cost comply with, and ensure all persons for whom it is directly or indirectly responsible under this contract comply with all Federal, Provincial, County, City and Municipal laws, Acts, Codes and Regulations pertaining to the performance of the contract.
- 1.13.2 The successful Respondent shall obtain all necessary permits, licenses and fees required for the execution of the work and pay all fees required, including legal fees if any.

**1.14.0 WCDSB POLICIES AND GUIDELINES**

- 1.14.1 No work is to commence until an official purchase order, or award letter is received.
- 1.14.2 At all times while on the Board property, the successful Respondent, and all people for whom they are directly or indirectly responsible in law or under the contract, shall comply with all policies, rules and requirements of the Board.

**END OF SECTION**

## 1.1 TENDER INFORMATION

NAME OF BIDDER: \_\_\_\_\_

TENDER CLOSE: April 15, 2026 at 2:00:00 p.m.

SUPPLEMENTAL TENDER FORM CLOSE:

April 15, 2026 at 3:00:00 p.m.

NAME OF PROJECT: St. Anne CES Renovation

PROJECT NUMBER: RFT 2026-10

ELECTRONIC BID SUBMISSIONS ONLY, shall be received by the Bidding System.

Supplementary Form of Tender to be emailed to [Stephen.butterworth@wcdsb.ca](mailto:Stephen.butterworth@wcdsb.ca)

## 1.2 ACKNOWLEDGEMENT RE EXAMINATION OF TENDER DOCUMENTS

- .1 Having carefully examined all of the drawings (Architectural, Structural, Mechanical, Electrical, Site Servicing and Landscape) and having carefully examined the Instructions to Bidders, the requirements of the *CCDC 2-2020 Stipulated Price Contract, as amended by the Supplementary Conditions, as attached*, and all of the attached Specifications; (Architectural, Structural, Mechanical, Electrical, Site Servicing and Landscape) including Addenda numbered as follows:

Addenda #.....to/and including Addenda  
#.....

and, having visited the sites, investigated and examined all conditions affecting the Work, including soil reports and surveys, and other reports as included in the Tender Documents, the undersigned Bidder makes the offers set out below.

## 1.3 CASH ALLOWANCES

- .1 All allowances specified under Section 01020 only amended as provided hereunder.

The Tender Amount includes the total Cash Allowance of \$41,500.00 not including Harmonized Sales Tax (HST). (*HST on Cash Allowance is not to be included in the Tender Amount*)

#### 1.4 TENDER AMOUNT

- .1 The undersigned Bidder hereby offers to furnish all materials, labour, plant and equipment and to perform all duties and services called for by the ENTIRE WORK INCLUDING ALL TRADES for the Project named above for the stipulated sum of:

.....  
(Written Value)

\$.....  
(Numeric Value)

in lawful money of Canada, excluding Harmonized Sales Tax, but including all other applicable Excise Taxes, Custom Duties, Insurance's, Freight, Exchange and all other charges.

#### 1.5 TENDER VALIDITY

- .1 The undersigned Bidder is hereby submitting a valid Tender and will enter into the *CCDC 2-2020 Stipulated Price Contract, as amended by the Supplementary Conditions, as attached*, if we are notified in writing of our Tender acceptance by THE BOARD within sixty (60) calendar days from the closing of the Tender.

#### 1.6 BONDING

- .1 The undersigned Bidder encloses a Bid Bond in the amount of [10]% made out in the name of WATERLOO CATHOLIC DISTRICT SCHOOL BOARD.
- .2 It is a condition of this Agreement that if the above mentioned Tender is accepted, application for a 50% Performance Bond and a 50% Labour and Material Payment Bond must be completed with undersigned within ten (10) days of acceptance of the tender related thereto, otherwise this Agreement shall be null and void.

#### 1.7 CONSTRUCTION SCHEDULE

- .1 The undersigned Bidder solemnly undertakes, as an integral part of our proposal and tender to:
- (a) Have the buildings "Fit for Occupancy" by August 31, 2026;
  - (b) Have all buildings and site work completed by September 7, 2026; and
  - (c) Have the Contract completed in its entirety by September 7, 2026.
- .2 The undersigned Bidder confirms that all appropriate costs, such as but not limited to winter heat, inclement weather protection and all overtime costs for all

trades to meet the aforementioned schedule, have been included in our tender price to achieve this date.

- .3 The Bidder acknowledges and agrees that so long as a building permit is obtained and the Bidder is directed to commence Work within the sixty (60) calendar days following the Closing Date, even if such direction does not occur until the fifty-ninth (59<sup>th</sup>) day following the Closing Date, the Bidder shall not be entitled to a delay claim.
- .4 The undersigned Bidder acknowledges and agrees to comply with the terms and conditions of the Project Occupancy Requirements as outlined in the Supplementary Conditions, attached hereto

### **1.8 REQUIRED DOCUMENTS**

- .1 If notified of the acceptance of this Tender via a Letter of Intent issued by the Board, the undersigned Bidder agrees to provide the prerequisite documentation within ten (10) days.

### **1.9 FEES FOR CHANGES IN THE WORK**

- .1 The undersigned Bidder acknowledges and agrees that the fees referred to in *CCDC 2-2020 Stipulated Price Contract, as amended by the Supplementary Conditions, as attached*, will apply to changes in the Contract not covered by Unit Prices.

### **1.10 SUPPLEMENTARY FORM OF TENDER**

- .1 The undersigned Bidder agrees to submit the *SUPPLEMENTARY FORM OF TENDER*, as attached, at Tender close, which shall including the following:
  - BID AND COST BREAKDOWN
  - LIST OF SUBCONTRACTORS / SUPPLIERS / INSTALLERS
  - SEPARATE PRICES - REQUESTED BY CONSULTANTS
  - UNIT PRICES
  - ITEMIZED PRICES - REQUESTED BY CONSULTANTS
  - ALTERNATE PRICES TO BASE BID
  - LIST OF ALTERNATIVE BIDS SUBMITTED FOR CONSIDERATION

### **1.11 DECLARATION OF NO CONFLICT**

- .1 The undersigned Bidder hereby declares that this Tender submission is made in good faith and without any connection, knowledge, comparison of figures, or arrangements with any other company, firm, or person making a Tender for the same work and is, in all respects, fair and without collusion with any other bidder for this Contract, and without fraud. The undersigned also represents and warrants that, to the best of the undersigned's knowledge and belief, no actual or potential conflict of interest exists with respect to the submission of the Tender or performance of the Contract other than those disclosed hereunder. The undersigned confirms that, where the Board discovers that the undersigned has

failed to disclose all actual or potential conflicts of interest, the Board may disqualify the undersigned or terminate any Contract awarded to the undersigned pursuant to this Tender process. The undersigned understands that, for the purposes hereof, "conflict of interest" also includes:

- (a) in relation to the Tender process, the undersigned has an unfair advantage or engages in conduct, directly or indirectly, that may give the undersigned an unfair advantage, including:
  - (i) having or having access to information in the preparation of the undersigned's proposal that is confidential to the Board and not available to other bidders; communicating with any person with a view to influencing preferred treatment in the Tender process; or, engaging in conduct that compromises or could be seen to compromise the integrity of the open and competitive process and render that process non-competitive and unfair; or,
- (b) in relation to the performance of its contractual obligations in a Board contract, the undersigned's other commitments, relationships or financial interests:
  - (i) could or could not be perceived to exercise an improper influence over the objective, unbiased and impartial exercise of the Board's independent judgment; or,
  - (ii) could or could not be perceived to compromise, impair or be incompatible with the effective performance of the undersigned's contractual obligations.

#### **1.12 MUNICIPAL FREEDOM OF INFORMATION AND PROTECTION OF PRIVACY ACT**

- .1 This Tender and supporting documentation shall become the property of the Board. Information in a Tender is subject to potential disclosure to third parties after the award, in accordance with the provisions of the Municipal Freedom of Information and Protection of Privacy Act, R.S.O. 1990 ("MFOIPOP"). The Bidder acknowledges that any personal or confidential information which Bidders provide is being collected and will be used exclusively for the purposes of analyzing, evaluating and assessing Tenders submitted. Any information a Bidder wishes to identify as proprietary and have maintained as confidential, excluding unit pricing information as well as the total dollar value of the Tender, must be clearly identified as such, and any proposed restrictions on disclosure specified. For the purposes of a report to the Trustees of the Board, pricing information as well as the total dollar value of the Tender may be reported in a public report and will not be considered confidential. In addition, the Board may be ordered by the Information & Privacy Commissioner under the provisions of MFOIPOP to disclose additional information identified by a Bidder as proprietary and confidential.

### **1.13 LIMITATION OF LIABILITY**

- .1 By submitting a Tender, the undersigned Bidder acknowledges and agrees that the Board will have no liability or obligation to any Tender except only that of the successful Bidder, if any, awarded the Contract by the Board, in its sole discretion. The Bidder also agrees that if the undersigned is not awarded the Contract, the Board shall be fully and forever released and discharged of all liability and obligations relating to this Request for Tender and all its submission procedures. All Bidders responding to this Request for Tender shall accept the decision of the Board as final and binding.

**1.14 SIGNING OF TENDER**

The undersigned Bidder is hereby submitting this Stipulated Sum Tender under a Corporate Seal or witnessed by an Individual.

PRINT COMPANY NAME: \_\_\_\_\_

PRINT ADDRESS OF COMPANY: \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

PRINT NAME OF CONTACT PERSON  
REGARDING THIS TENDER: \_\_\_\_\_

CONTACT PERSON'S EMAIL: \_\_\_\_\_

PHONE NUMBER OF COMPANY: \_\_\_\_\_

SIGNATURE OF SIGNING OFFICER: \_\_\_\_\_

DATE: \_\_\_\_\_

PRINT NAME OF SIGNING OFFICER: \_\_\_\_\_

PRINT TITLE OF SIGNING OFFICER: \_\_\_\_\_

SIGNATURE OF WITNESS: \_\_\_\_\_

PRINT NAME OF WITNESS: \_\_\_\_\_

AFFIX CORPORATE SEAL (If no individual Witness):

**END OF SECTION**

Submit this Supplementary Form of Tender at the close of General Tenders.

**1.1 TENDER INFORMATION**

TENDER CLOSE: April 15, 2026 at 2:00:00 p.m.

SUPPLEMENTAL TENDER FORM CLOSE:

April 15, 2026 at 3:00:00 p.m.

NAME OF PROJECT: St. Anne CES Renovation

PROJECT NUMBER: RFT 2026-10

Submission Email Address: [stephen.butterworth@wcdsb.ca](mailto:stephen.butterworth@wcdsb.ca)

**1.2 SUPPLEMENTARY LIST OF SUBCONTRACTORS**

.1 I/We, the undersigned, propose to use the following Subcontractors and/or suppliers to perform work of this Contract, and I/we confirm that all have been investigated to confirm their reliability and competence to carry out the Work in accordance with the Contract Documents; and I/we agree that no changes from this may be made without the express written approval of the Board.

Extra costs to the Contract will not be considered for a Subcontractor/supplier substitution, regardless of the reason, except where a substitution is requested by the Owner.

Metal Fabrications \_\_\_\_\_

Glazing \_\_\_\_\_

Gypsum Board and Acoustical Ceilings \_\_\_\_\_

Ceramic Tile \_\_\_\_\_

Resilient Flooring \_\_\_\_\_

Painting \_\_\_\_\_

Whiteboards and Tackboards \_\_\_\_\_

Electrical \_\_\_\_\_

Mechanical \_\_\_\_\_

**1.3 SEPARATE PRICES**

.1 N/A

**1.4 ELECTRICAL UNIT PRICES:**

- .1 I/We enclose herewith Unit Prices, exclusive of applicable taxes, which are an integral part of the Bid. Unit prices are, in effect, for the duration of this Project's construction period, unit prices are exclusive of applicable taxes.
- .2 The following unit costs will apply to all additional or deleted work from the Contract and should include their proportionate share of all labour equipment, materials, accessories, profits, overhead and taxes for a job completely installed. Applications of unit prices will be to the net difference of quantities of individual products and materials in each Proposed Change or Change Order.
- .3 The unit prices will be used for additions and deletions. Credit rate for deletions shall be at 80% of original rates listed under sections 1.4, 1.5, 1.6, 1.7, 1.8, 1.9.

.4 Conduit and Cable:

Supply and install the following conduit and cables including fastenings, clips, connectors, coupling boxes, etc. as required based on length as shown.

MORE WORK

- .1 25MM EC/3500mm Length \$ \_\_\_\_\_
- .2 2 #12-12mm C/3500mm Length \$ \_\_\_\_\_
- .3 3 #12-12mm C/3500mm Length \$ \_\_\_\_\_
- .4 2 #10-19mm C/3500mm Length \$ \_\_\_\_\_
- .5 3 #10-19mm C/3500mm Length \$ \_\_\_\_\_
- .6 3 #8- 19mm C/3500mm Length \$ \_\_\_\_\_

.5 Lighting Fixtures:

Supply and installation of the following lighting fixtures. The supply and installation of lighting fixtures shall include the fixtures, flexible conduit, wiring and connection to nearest outlet box containing 347 and/or 120 volt circuits and the supply and installation of the lamps. (Base conduit and wiring on 4500mm length).

MORE WORK

- .1 Supply and installation of one type 'A' fixture \$ \_\_\_\_\_
- .2 Supply and installation of one type 'B' fixture \$ \_\_\_\_\_

.3 Supply and installation of one type  
'C' fixture \$ \_\_\_\_\_

### 1.5 LABOUR RATES

I/We enclose herewith Labour Rates which are an integral part of the Tender. Labour rates are in effect for the duration of this Project's construction period. The Owner is not obligated to accept Labour rates indicated.

#### .1 Mechanical Labour Rates

Labour at the following rates should be applied for additions or deletions to the work not covered by unit prices. The prices consist of salary, all agreed local union benefits. The rate quoted represents the net cost to the Contractor, exclusive of overhead and profit and applicable taxes.

.1	Plumbing & Drainage Tradesmen	\$ _____ Per Hour
.2	HVAC Piping Tradesman	\$ _____ Per Hour
.3	Insulation Tradesmen	\$ _____ Per Hour
.4	Sheet Metal Tradesmen	
.1	Shop	\$ _____ Per Hour
.2	Field	\$ _____ Per Hour
.5	(Other)	\$ _____ Per Hour

### 1.6 MECHANICAL MANUFACTURERS AND SUPPLIERS:

I/We enclose herewith a list of Manufacturers and Suppliers to the Mechanical Building Services which is an integral part of the Tender. We hereby agree that the Owner may select from any substitutes that we have offered in our Tender. Our Tender Price is based on the equipment/manufacturers indicated hereunder and we hereby agree that we will not alter the indicated equipment/manufacturers unless specifically authorized by the Owner.

I/We, the undersigned, have inserted below proposed substitutions and prices for the Owner's consideration.

I/We agree that:

- .1 all prices submitted take into consideration and allow for changes and adjustments in other work as may be necessary to provide a finished and functional result, unless specifically indicated otherwise;
- .2 alternative prices are for work which is not included in the Tender price listed on Form of Tender but which may be substituted by the Owner for work which is included (no price listed shall mean no change in cost);
- .3 and that the Board reserves the right to accept or reject any of the prices proposed hereunder;
- .4 prices listed hereunder do not include HST

	<u>Product/Equipment Specified</u>	<u>Proposed Substitution</u>	<u>Reduction in Contract Price</u>
.1	_____	_____	\$ _____
.2	_____	_____	\$ _____
.3	_____	_____	\$ _____
.4	_____	_____	\$ _____
.5	_____	_____	\$ _____
.6	_____	_____	\$ _____

Attach additional sheets and supporting documentation, if necessary.

### 1.7 STANDARDS OF MECHANICAL MATERIALS

BASE BID ITEM	ACCEPTABLE BASIS OF DESIGN	ALTERNATE
Pipe Hangers	Grinnell	Crane, Flamco, Unistrut
Mechanical Grooved Joints	Victaulic	Coupcos, Gruvlok
Unions	Crane	Grinnell, Dart
Expansion Joints	Flexonics	Amtrol, Hydroflex Tube Turn
Gate, Globe & Ball Valve	Crane	Jenkins, Toyo/R+W Kitz
Check Valves	Crane	Jenkins, Toyo/R+W Kitz
Plug Valves	DeZurick	NEO
Circuit Balancing Valves	Tour and Andersson	
Butterfly Valves	Crane	Jenkins, Centerline, Kitz, Toyo
Thermal Insulation	Fiberglas Canada	Manson, Knauf Johns-Manville
Pumps & Circulators (Except as noted)	S.A. Armstrong	ITT Fluids
Extended Shaft Coupling VIL Pumps	S.A. Armstrong	ITT Fluids
Strainers	Sarco	Crane, McAvity, Morrison Brass, Braukmann
Suction Guides	S.A. Armstrong	ITT Fluids, Victualic
Automatic Air Vents	Sarco	Amtrol, Braukmann S.A. Armstrong Terice

BASE BID ITEM	ACCEPTABLE BASIS OF DESIGN	ALTERNATE
Backflow Preventors	Watts	Braukmann, Zurn-Wilkins
Make-Up Assemblies	Watts	S.A. Armstrong, Bell & Gossett, Mueller, Singer
Gauges, Thermometers	Trerice	Ashrcroft, Weiss Weksler, Winters, Wika
Finned Tube Radiation and Convectors	Sigma	Dunham-Bush, Trane Engineered Air
Hot Water Unit Heaters and Cabinet Heaters	Sigma	Dunham-Bush, McQuay, Trane, Engineered Air
Steam Humidifiers	Engineered Air	Dri Steem
Hot Water Boilers	Boderus	
Prefabricated Chimneys	Van-Packer	Metal-Fab, Selkirk, ICC
Water Treatment	Aqurian	Alchem, Mogul, Culligan, Finnan
Fire Dampers	Controlled Air	Air Balance, Canadian Advanced Air, Ruskin
Louvre Insulated Blank-off Panels	Construction Specialties	
Air Terminal Devices (Diffusers, Registers, Grilles By-Pass Boxes)	E.H. Price	Nailor, Kruger, Carnes, Titus Tuttle & Bailey
Air Handling Unit	Engineered Air	McQuay, Trane, Haakon

BASE BID ITEM	ACCEPTABLE BASIS OF DESIGN	ALTERNATE
Heat Recovery Unit	Engineered Air	McQuay, Trane, Haakon
Fan Coil Units	Enviro-Tech	Trane, York
Misc. Fans	Cook	Carnes, Greenheck, ACME, Jenn-Air
Air Filters	Farr	Cambridge, Airguard, Vibron, A.A.F.
Filter Gauges	Dwyer	Airflow Developments (Canada) Ltd.
Dampers (Except low leakage)	Tamco	Johnson, Powers, Kerr Hunt, Honeywell, Barber-Coleman
Low Leakage Dampers	Tamco Series 9000	
Electrical Starters, Disconnects, MCC's, Alternator Panels	Square 'D'	Allen-Bradley, Klockner-Moeller
Noise and Vibration Control	Vibron	Korfund-Sampson, Vibro-Acoustics, Coolbreeze J.P. Environmental
Electric Pipe Tracing	Raychem	Serge-Baril
Trap Primers	PPP	
Plumbing Fixtures	American Standard	Crane, Kohler, Eljer
Floor Drains, Roof Drains, Cleanouts, Drainage Specialties	Zurn	Ancon J.R. Smith Mifab
Plumbing Trim	Chicago Faucets, Symmons	American Standard, Crane, Cambridge Brass

BASE BID ITEM	ACCEPTABLE BASIS OF DESIGN	ALTERNATE
Toilet Seats	Centoco	Beneke, Moldex, Olsonite
Domestic Water Heaters	Bradford-White	A.O. Smith, John Wood
Fire Extinguishers & Cabinets	National Fire Equipment	Wilson & Cousins
Washfountains	Bradley, Acorn	
S.S. Sinks	Aristaline	Kindred, Architectural Metal
Drinking Fountains	Haws	Sunroc
Emergency Eyewash	Haws	Bradley, Speakman
Mixing Valves	Symmons	Powers
Alarm Valves And Trim	Grinnell, Central	Reliable, Viking, Automatic, Victaulic
Siamese Connections	National Fire Equipment	Wilson & Cousins, Stelpro
Sprinkler Heads	Grinnell, Central	Reliable, Viking, Automatic, Victaulic
Equipment Cabinets	National Fire Equipment	Wilson & Cousins, Stelpro
Excess Pressure Pump	Albany	

**1.8 SIGNING OF SUPPLEMENTARY FORM OF TENDER**

PRINT COMPANY NAME: \_\_\_\_\_

PRINT NAME OF CONTACT PERSON  
REGARDING THIS TENDER: \_\_\_\_\_

PRINT ADDRESS OF COMPANY: \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

PHONE NUMBER OF COMPANY: \_\_\_\_\_

PRINT NAME OF CONTACT PERSON  
REGARDING THIS TENDER: \_\_\_\_\_

CONTACT PERSON'S EMAIL: \_\_\_\_\_

EMAIL ADDRESS SIGNING OFFICER: \_\_\_\_\_

SIGNATURE OF SIGNING OFFICER: \_\_\_\_\_

DATE: \_\_\_\_\_

PRINT NAME OF SIGNING OFFICER: \_\_\_\_\_

PRINT TITLE OF SIGNING OFFICER: \_\_\_\_\_

SIGNATURE OF WITNESS: \_\_\_\_\_

PRINT NAME OF WITNESS: \_\_\_\_\_

AFFIX CORPORATE SEAL (If no individual Witness):

**END OF SECTION**



Waterloo Catholic  
District School Board

**SUPPLEMENTARY CONDITIONS  
AMENDMENTS TO CCDC 2 – 2020  
STIPULATED PRICE CONTRACT (Version May 2022)**

- 1 -



**Waterloo Catholic  
District School Board**

**SUPPLEMENTARY CONDITIONS &  
AMENDMENTS TO STANDARD CONSTRUCTION  
DOCUMENT CCDC2 -2020 STIPULATED PRICE  
CONTRACT**

**(the “Supplementary Conditions”)**

**AGREEMENT, DEFINITIONS, AND  
GENERAL CONDITIONS**



**SUPPLEMENTARY CONDITIONS**  
**AMENDMENTS TO CCDC 2 – 2020**  
**STIPULATED PRICE CONTRACT (Version May 2022)**

- 2 -

The Standard Construction Document CCDC 2 2020 for a Stipulated Price Contract, English version, consisting of the Agreement Between *Owner* and Contractor, Definitions and General Conditions of the Stipulated Price Contract, Parts 1 to 13 inclusive, governing same, together with the changes with the new *Construction Act* is hereby made part of these *Contract Documents*, with the following amendments, additions and modifications:

**AGREEMENT BETWEEN OWNER AND CONTRACTOR**

**SC1 ARTICLE A-1 – THE WORK**

SC1.1	A-1.3	<p><u>Amend</u> Article A-1.3 by <u>deleting</u> all of the words after “<i>Contract Documents</i>” and <u>replace</u> them with the following”</p> <p>“attain</p> <p>.1 <i>Substantial Performance of the Work</i> by the 28 day of August in the year 2026.</p> <p>.2 (if applicable) <i>Occupancy</i> by the 31 day of August in the year 2026, and</p> <p>.3 <i>Ready-for-Takeover</i> by the 7 day of September in the year 2026.”</p>
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**SC2 ARTICLE A-3 – CONTRACT DOCUMENTS**

SC2.1	A-3.1	<p><u>Add</u> the following documents to the list of <i>Contract Documents</i> in Article A-3.1:</p> <ul style="list-style-type: none"> <li>• Waterloo Catholic District School Board’s Supplementary Conditions &amp; Amendments to Standard Construction Document CCDC2-2020 Stipulated Price Subcontract, May 2022 Version, including any Special Supplementary Conditions listed in Appendix 2 thereto</li> <li>• <i>Drawings</i></li> <li>• <i>Specifications</i></li> <li>• Performance Bond (Form 32 -Performance Bond under Section 85.1 of the <i>Act</i>)</li> <li>• Labour and Material Payment Bond (Form 31 – Labour and Material Payment Bond under Section 85.1 of the <i>Act</i>)</li> </ul>
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**SC3 ARTICLE A-4 – CONTRACT PRICE**

SC3.1	A-4.4	<p><u>Delete</u> Article A-4.4 and <u>replace</u> it with the following:</p> <p>“4.4 The <i>Contract Price</i> shall remain fixed for the duration of the <i>Contract Time</i>, subject only to adjustments as provided for in the <i>Contract Documents</i>. For certainty, and without limiting the general application of the preceding sentence, the <i>Contractor</i> assumes all risks in connection with cost increases for overhead, <i>Products</i>, <i>Labour</i>, and <i>Construction Equipment</i> prescribed by the <i>Contract Documents</i> for the performance of the <i>Work</i>, and the <i>Contractor</i> assumes all responsibility for liabilities and additional costs that may arise as a result of the <i>Contractor’s</i> inclusion of any <i>Product</i>, <i>Construction Equipment</i>, <i>Supplier</i>, or <i>Subcontractor</i> in its calculation of the <i>Contract Price</i>.”</p>
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**SC4 ARTICLE A-5 – PAYMENT**

SC4.1	A-5.1	<p><u>Delete</u> Article A- 5.1 in its entirety including all subparagraphs and <u>replace</u> it with the following:</p>
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**SUPPLEMENTARY CONDITIONS**  
**AMENDMENTS TO CCDC 2 – 2020**  
**STIPULATED PRICE CONTRACT (Version May 2022)**

		<p>“5.1 Subject to the provisions of the <i>Contract Documents</i> and the <i>Construction Act</i>, the <i>Owner</i> shall:</p> <ul style="list-style-type: none"> <li>.1 make progress payments to the <i>Contractor</i> on account of the <i>Contract Price</i> when due together with such <i>Value Added Taxes</i> as may be applicable to such payments,</li> <li>.2 upon <i>Substantial Performance of the Work</i> as certified by the <i>Consultant</i>, and on the 61<sup>st</sup> day after the publication of the certificate of <i>Substantial Performance of the Work</i>, in accordance with the <i>Construction Act</i>, there being no claims for lien registered against the title to the <i>Place of the Work</i> and no written notices of lien delivered to the <i>Owner</i>, pay the <i>Contractor</i> the unpaid balance of the holdback, together with such <i>Value Added Taxes</i> as may be applicable to such payment, less any amount stated in the <i>Owner’s Notice of Non-Payment</i>.</li> <li>.3 after <i>Ready-for-Takeover</i> has been achieved in accordance with the <i>Contract Documents</i> and the <i>Work</i> is complete, there being no claims for lien registered against the title to the <i>Place of the Work</i> and no written notices of lien delivered to the <i>Owner</i>, pay the <i>Contractor</i> any unpaid balance of the <i>Contract Price</i> in accordance with GC 5.5 – FINAL PAYMENT, together with such <i>Value Added Taxes</i> as may be applicable to such payment.”</li> </ul>
SC 4.2	A-5.2.1	<p><u>Delete</u> subparagraph 5.2.1 in its entirety and <u>replace</u> it with the following:</p> <p>“.1 Should either party fail to make payments as they become due under the terms of the <i>Contract</i> or in an award by arbitration or court, interest shall also become due and payable on such unpaid amounts at the prejudgment interest rate prescribed by the <i>Courts of Justice Act</i> (Ontario), as it may change from time to time.”</p>

**SC5 \*NEW\* ARTICLE A-9 – CONFLICT OF INTEREST**

SC5.1	A-9	<p><u>Add</u> new ARTICLE A-9 CONFLICT OF INTEREST as follows:</p> <p><b>“ARTICLE A-9 CONFLICT OF INTEREST</b></p> <p>9.1 The <i>Contractor</i>, <i>Subcontractors</i> and <i>Suppliers</i> and any of their respective advisors, partners, directors, officers, employees, agents, and volunteers shall not engage in any activity or provide any services where such activity or the provision of such services creates a conflict of interest (actually or potentially, in the sole opinion of the <i>Owner</i>) with the provision of the <i>Work</i> pursuant to the <i>Contract</i>. The <i>Contractor</i> acknowledges and agrees that a conflict of interest, as described in this Article A-9, includes, but is not limited to, the use of <i>Confidential Information</i> where the <i>Owner</i> has not specifically authorized such use.</p> <p>9.2 The <i>Contractor</i> shall disclose to the <i>Owner</i>, in writing, without delay, any actual or potential situation that may be reasonably interpreted as either a conflict of interest or a potential conflict of interest, including the retention of any <i>Subcontractor</i> or <i>Supplier</i> that is directly or indirectly affiliated with or related to the <i>Contractor</i>.</p> <p>9.3 The <i>Contractor</i> covenants and agrees that it will not hire or retain the services of any employee or previous employee of the <i>Owner</i> where to do so constitutes a breach by such employee or previous employee of the <i>Owner’s</i> conflict of interest policy, as it may be amended from time to time, until after completion of the <i>Work</i> under the <i>Contract</i>.</p> <p>9.4 It is of the essence of the <i>Contract</i> that the <i>Owner</i> shall not have direct or indirect liability to any <i>Subcontractor</i> or <i>Supplier</i>, and that the <i>Owner</i> relies on the maintenance of an arm's-length relationship between the <i>Contractor</i> and its</p>
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		<p><i>Subcontractors and Suppliers</i>. Consistent with this fundamental term of the <i>Contract</i>, the <i>Contractor</i> will not enter into any agreement or understanding with any <i>Subcontractor or Supplier</i>, whether as part of any contract or any written or oral collateral agreement, pursuant to which the parties thereto agree to cooperate in the presentation of a claim for payment against the <i>Owner</i>, directly or through the <i>Contractor</i>, where such claim is, in whole or in part, in respect of a disputed claim by the <i>Subcontractor or Supplier</i> against the <i>Contractor</i>, where the payment to the <i>Subcontractor or Supplier</i> by the <i>Contractor</i> is agreed to be conditional or contingent on the ability to recover those amounts or a portion thereof from the <i>Owner</i>, failing which the <i>Contractor</i> shall be saved harmless from all or a portion of those claims. The <i>Contractor</i> acknowledges that any such agreement would undermine the required arm's-length relationship and constitute a conflict of interest. For greater certainty, the <i>Contractor</i> shall only be entitled to advance claims against the <i>Owner</i> for amounts pertaining to <i>Subcontractor or Supplier</i> claims where the <i>Contractor</i> has actually paid or unconditionally acknowledged liability for those claims or where those claims are the subject of litigation or binding arbitration between the <i>Subcontractor or Supplier</i> and the <i>Contractor</i> has been found liable for those claims.</p> <p>9.5 Notwithstanding paragraph 7.1.2 of GC 7.1 - OWNER'S RIGHT TO PERFORM THE WORK, TERMINATE THE CONTRACTOR'S RIGHT TO CONTINUE WITH THE WORK, OR TERMINATE THE CONTRACT, a breach of this Article A-9 by the <i>Contractor</i>, any of the <i>Subcontractors</i>, or any of their respective advisors, partners, directors, officers, employees, agents, and volunteers shall entitle the <i>Owner</i> to terminate the <i>Contract</i>, in addition to any other rights and remedies that the <i>Owner</i> has in the <i>Contract</i>, in law, or in equity."</p>
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**SC6 \*NEW\* ARTICLE A-10 TIME OF THE ESSENCE**

SC6.1	Article A-10	<p><u>Add</u> the following new Article A-10 as follows:</p> <p><b>“ARTICLE A-10 TIME OF THE ESSENCE</b></p> <p>10.1 It is agreed that one of the reasons the <i>Contractor</i> was selected by the <i>Owner</i> for this <i>Contract</i> is the <i>Contractor's</i> representation and covenant that it will attain <i>Substantial Performance, Occupancy</i> (if applicable), and <i>Ready-for-Takeover</i> within the <i>Contract Time</i> stated in Article A-1 of this <i>Contract</i>.</p> <p>10.2 The <i>Contractor</i> acknowledges and agrees that it is responsible to marshal its resources and those of its <i>Subcontractors and Suppliers</i> in a manner which will permit timely attainment of <i>Substantial Performance, Occupancy</i> (if applicable), and <i>Ready-for-Takeover</i>. The <i>Contractor</i> agrees that time is of the essence of this <i>Contract</i>.”</p>
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**SC7 DEFINITIONS**

<b>Revisions to Existing Definitions</b>		
SC7.1	Consultant	<p><u>Amend</u> the definition of “Consultant” by <u>adding</u> the following to the end of the definition:</p> <p>“For the purposes of the <i>Contract</i>, the terms “<i>Consultant</i>”, “<i>Architect</i>” and “<i>Engineer</i>” shall be considered synonymous.”</p>



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SC7.2	Payment Legislation/Construction Act	<p><u>Delete</u> the Definition of <i>Payment Legislation</i> and replace it with “Construction Act” as follows:</p> <p><b>“Construction Act</b></p> <p><i>Construction Act</i> means the <i>Construction Act</i>, R.S.O. 1990, c. C.30, as amended, including all regulations passed under it that are enforceable as of the date of execution of this <i>Contract</i>. For certainty, the first procurement process for the <i>Project</i> (i.e., the “improvement” as that term is defined in the <i>Construction Act</i>) was commenced on or after October 1, 2019.”</p>
SC7.3	Ready-for-Takeover	<p><u>Amend</u> the Definition of <i>Ready-for-Takeover</i> by deleting all the words after “as verified” and replacing them with “and approved by the <i>Owner</i>.”</p>
<b>New Definitions</b>		
SC7.4	Adjudication	<p><u>Add</u> the following definition:</p> <p><b>“Adjudication</b></p> <p><i>Adjudication</i> means construction dispute interim adjudication as defined under the <i>Construction Act</i>.”</p>
SC7.5	Close-Out Documentation	<p><u>Add</u> the following new definition:</p> <p><b>“Close-Out Documentation</b></p> <p><i>Close-Out Documentation</i> has the meaning given to it under GC 5.4.2.”</p>
SC7.6	Confidential Information	<p><u>Add</u> the following definition:</p> <p><b>“Confidential Information</b></p> <p><i>Confidential Information</i> means all the information or material of the <i>Owner</i> that is of a proprietary or confidential nature, whether it is identified as proprietary or confidential or not, including but not limited to information and material of every kind and description (such as drawings and move-lists) which is communicated to or comes into the possession or control of the <i>Contractor</i> at any time, but <i>Confidential Information</i> shall not include information that:</p> <ol style="list-style-type: none"> <li>.1 is or becomes generally available to the public without fault or breach on the part of the <i>Contractor</i>, including without limitation breach of any duty of confidentiality owed by the <i>Contractor</i> to the <i>Owner</i> or to any third party, but only after that information becomes generally available to the public;</li> <li>.2 the <i>Contractor</i> can demonstrate to have been rightfully obtained by the <i>Contractor</i> from a third party who had the right to transfer or disclose it to the <i>Contractor</i> free of any obligation of confidence;</li> <li>.3 the <i>Contractor</i> can demonstrate to have been rightfully known to or in the possession of the <i>Contractor</i> at the time of disclosure, free of any obligation of confidence; or</li> <li>.4 is independently developed by the <i>Contractor</i> without use of any <i>Confidential Information</i>.”</li> </ol>
SC7.7	Construction Schedule	<p><u>Add</u> the following definition:</p> <p><b>“Construction Schedule</b></p> <p><i>Construction Schedule</i> means the schedule for the performance of the <i>Work</i> provided by the <i>Contractor</i>, and approved by the <i>Owner</i>, pursuant to GC 3.4.1, including any amendments to the <i>Construction Schedule</i> made pursuant to the <i>Contract Documents</i>.”</p>



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SC7.8	Construction Schedule Update	<p><u>Add</u> the following definition:</p> <p><b>“Construction Schedule Update</b></p> <p><i>Construction Schedule Update</i> means an update to the <i>Construction Schedule</i> by the <i>Contractor</i> using Microsoft Project (or other approved scheduling software) that accurately depicts the progress of the <i>Work</i> relative to the critical path established in the <i>Construction Schedule</i> approved in GC 3.5.1 (or any approved successor <i>Construction Schedule</i>), aligns with the currently approved date for <i>Substantial Performance of the Work</i>, shows up-to-date projected major activity sequences and durations, and shows any changes or delays in anticipated completion dates of major activities in the <i>Work</i> relative to the last <i>Construction Schedule Update</i>, and includes the following minimum deliverables:</p> <ul style="list-style-type: none"> <li>(a) a record version of the updated <i>Construction Schedule</i> in .pdf format;</li> <li>(b) an editable copy of the updated original digital file of the <i>Construction Schedule</i> (e.g., .mpp format files for Microsoft Project).”</li> </ul>
SC7.9	Direct Costs	<p><u>Add</u> the following definition:</p> <p><b>“Direct Costs</b></p> <p><i>Direct Costs</i> are the reasonable costs of performing the contract or subcontract including costs related to the additional supply of services or materials (including equipment rentals), insurance and surety bond premiums, and costs resulting from seasonal conditions, that would not have been incurred, but do not include indirect damages suffered, such as loss of profit, productivity or opportunity, or any head office overhead costs.”</p>
SC7.10	EFT	<p><u>Add</u> the following definition:</p> <p><b>“EFT</b></p> <p><i>EFT</i> has the definition given to it under GC 5.3.2.”</p>
SC7.11	Excess Soil	<p><u>Add</u> the following definition:</p> <p><b>“Excess Soil</b></p> <p><i>Excess Soil</i> means “excess soil” as that term is defined under section 3 of the <i>Excess Soil Regulation</i>.”</p>
SC7.12	Excess Soil Regulation	<p><u>Add</u> the following Definition:</p> <p><b>“Excess Soil Regulation</b></p> <p><i>Excess Soil Regulation</i> means O. Reg. 406/19: On-Site and Excess Soil Management to the <i>Environmental Protection Act</i>, R.S.O. 1990, c. E.19.”</p>
SC7.13	Final Pre-Invoice Submission Meeting	<p><u>Add</u> the following definition:</p> <p><b>“Final Pre-Invoice Submission Meeting</b></p> <p><i>Final Pre-Invoice Submission Meeting</i> has the meaning given to it in GC 5.5.1.”</p>



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SC7.14	Force Majeure	<p><u>Add</u> the following definition:</p> <p><b>“Force Majeure</b></p> <p><i>Force Majeure</i> means any cause, unknown at the effective date of the <i>Contract</i> and beyond either party’s control, other than financial difficulties, bankruptcy or insolvency, which prevents the performance by a party, or both, of any of their respective obligations under the <i>Contract</i> and the event of <i>Force Majeure</i> did not arise from a party’s default and could not be avoided or mitigated by the exercise of reasonable effort or foresight. <i>Force Majeure</i> includes <i>Labour Disputes</i>; fire; unusual delay by common carriers or unavoidable casualties; delays in obtaining third-party licences, permits, agreements, or approvals (excluding approvals of any <i>Subcontractors</i> or <i>Suppliers</i> of any tier); civil disturbance; emergency acts, orders, legislation, regulations or directives of any government or other public authority; acts of a public enemy; war; riot; sabotage; blockage; embargo; lightning; earthquake; adverse weather conditions but only if substantially beyond the weather norms of the <i>Place of the Work</i>; acts of God; or declared epidemic or pandemic outbreak or other public health emergency (e.g. SARS, COVID-19).”</p>
SC7.15	Install	<p><u>Add</u> the following definition:</p> <p><b>“Install</b></p> <p><i>Install</i> means install and connect. <i>Install</i> has this meaning whether or not the first letter is capitalized.”</p>
SC7.16	Labour Dispute	<p><u>Add</u> the following definition:</p> <p><b>“Labour Dispute</b></p> <p><i>Labour Dispute</i> means any lawful or unlawful labour problems, work stoppage, labour disruption, strike, job action, slow down, lock-outs, picketing, refusal to work or continue to work, refusal to supply materials, cessation or work or other labour controversy which does, or might, affect the <i>Work</i>.”</p>
SC7.17	Notice of Non-Payment	<p><u>Add</u> the following definition:</p> <p><b>“Notice of Non-Payment</b></p> <p><i>Notice of Non-Payment</i> means a notice of non-payment of holdback (Form 6) or a notice of non-payment (Form 1.1) under the <i>Act</i>, as applicable to the circumstances.”</p>
SC7.18	OHSA	<p><u>Add</u> the following definition:</p> <p><b>“OHSA</b></p> <p><i>OHSA</i> means the <i>Occupational Health and Safety Act</i>, R.S.O. 1990, c. O.1, as amended, including all regulations thereto.”</p>
SC7.19	Overhead	<p><u>Add</u> the following definition:</p> <p><b>“Overhead</b></p> <p><i>Overhead</i> means all site and head office operations and facilities, all site and head office administration and supervision; all duties and taxes for permits and licenses required by the authorities having jurisdiction at the <i>Place of the Work</i>; all requirements of Division 1, including but not limited to submittals, warranty, quality control, calculations, testing and inspections; meals and accommodations; and, tools, expendables and clean-up costs.”</p>



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SC7.20	Payment Period	<p><u>Add</u> the following definition:</p> <p><b>“Payment Period</b></p> <p><i>Payment Period</i> has the definition given to it under GC 5.2.1.”</p>
SC7.21	Pre-Invoice Submission Meeting	<p><u>Add</u> the following definition:</p> <p><b>“Pre-Invoice Submission Meeting</b></p> <p><i>Pre-Invoice Submission Meeting</i> has the definition given to it under GC 5.2.1.”</p>
SC7.22	Proper Invoice	<p><u>Add</u> the following definition:</p> <p><b>“Proper Invoice</b></p> <p><i>Proper Invoice</i> means a “proper invoice” as that term is defined in Section 6.1 of the <i>Act</i>, including the minimum requirements set out in Appendix “1” of the Supplementary Conditions.”</p>
SC7.23	Proper Invoice Submission Date	<p><u>Add</u> the following definition:</p> <p><b>“Proper Invoice Submission Date</b></p> <p><i>Proper Invoice Submission Date</i> has the definition given to it under GC 5.2.2.1.”</p>
SC7.24	Request for Information (RFI)	<p><u>Add</u> the following definition:</p> <p><b>“Request for Information (RFI)</b></p> <p><i>Request for Information</i> or <i>RFI</i> means written documentation sent by the <i>Contractor</i> to the <i>Owner</i> or to the <i>Owner’s</i> representative or the <i>Consultant</i> requesting written clarification(s) and/or interpretation(s) of the <i>Drawings</i> and/or <i>Specifications</i>, <i>Contract</i> requirements and/or other pertinent information required to complete the <i>Work</i> of the <i>Contract</i> without applying for a change or changes to the <i>Work</i>.”</p>
SC7.25	Restricted Period	<p><u>Add</u> the following definition:</p> <p><b>“Restricted Period</b></p> <p><i>Restricted Period</i> means the (inclusive) period of time between December 1 to January 8 and August 15 to September 15 of any given year throughout the duration of the <i>Contract</i>.”</p>

**GENERAL CONDITIONS OF THE STIPULATED PRICE CONTRACT**

Where a General Condition or paragraph of the General Conditions of the *Contract* is deleted by these amendments, the numbering of the remaining General Conditions or paragraphs shall remain unchanged, unless stated otherwise herein, and the numbering of the deleted item will be retained, unused.

**PART 1 GENERAL PROVISIONS**

**SC8 GC 1.1 CONTRACT DOCUMENTS**

SC8.1	1.1.3	<p><u>Delete</u> GC 1.1.3 in its entirety and <u>replace</u> it with the following:</p> <p>“1.1.3 The <i>Contractor</i> shall review the <i>Contract Documents</i> and shall report promptly to the <i>Consultant</i> any error, inconsistency, or omission the <i>Contractor</i> may discover. Such review by the <i>Contractor</i> shall be undertaken with the standard of care described in GC 3.13.1. Except for its obligation to make such review and report the result, the</p>
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		<p><i>Contractor</i> does not assume any responsibility to the <i>Owner</i> or to the <i>Consultant</i> for the accuracy of the <i>Contract Documents</i>. Provided it has exercised the degree of care and skill described in this GC 1.1.3, the <i>Contractor</i> shall not be liable for damage or costs resulting from such errors, inconsistencies, or omissions in the <i>Contract Documents</i>, which the <i>Contractor</i> could not reasonably have discovered through the exercise of the required standard of care.”</p>
SC8.2	1.1.4	<p><u>Delete</u> GC 1.1.4 in its entirety and <u>replace</u> it with the following:</p> <p>“1.1.4 Except for the obligation to complete the review prescribed in GC 1.1.3, and report the results as set out in this GC 1.1.4, the <i>Contractor</i> is not responsible for errors, omissions or inconsistencies in the <i>Contract Documents</i>. If there are errors, omissions or inconsistencies discovered by or made known to the <i>Contractor</i> as part of its review under GC 1.1.3 or at any time during the performance of the <i>Work</i>, the <i>Contractor</i> shall immediately notify the <i>Consultant</i>, and request instructions, a <i>Supplemental Instruction</i>, <i>Change Order</i>, or <i>Change Directive</i>, as the case may require, and shall not proceed with the <i>Work</i> affected until the <i>Contractor</i> has received corrected or additional information from the <i>Consultant</i>. The <i>Contractor</i> shall not be liable for damage or costs resulting from such errors, inconsistencies, or omissions in the <i>Contract Documents</i>, which the <i>Contractor</i> could not reasonably have discovered through the exercise of care and skill described in GC 3.13.”</p>
SC8.3	1.1.5.1	<p><u>Delete</u> GC 1.1.5.1 and <u>replace</u> with the following:</p> <p>“.1 the order of priority of documents, from highest to lowest, shall be:</p> <ul style="list-style-type: none"> <li>.1 Supplementary Conditions;</li> <li>.2 the Agreement between the Owner and the Contractor;</li> <li>.3 the Definitions;</li> <li>.4 the General Conditions;</li> <li>.5 Division 01 of the <i>Specifications</i></li> <li>.6 technical <i>Specifications</i>;</li> <li>.7 material and finishing schedules; and</li> <li>.8 the <i>Drawings</i>.</li> </ul>
SC8.4	1.1.5.5	<p><u>Delete</u> GC 1.1.5.5 and <u>replace</u> with the following:</p> <p>“.5 Noted materials and annotations on the <i>Drawings</i> shall govern over the graphic representation of the <i>Drawings</i>.”</p>
SC8.5	1.1.5.6 to 1.1.5.8	<p><u>Add</u> the following new GC 1.1.5.6 to 1.1.5.8 as follows:</p> <p>“.6 Finishes in the room finish schedules shall govern over those shown on the <i>Drawings</i>.</p> <p>.7 Architectural drawings shall have precedence over structural, plumbing, mechanical, electrical and landscape drawings insofar as outlining, determining and interpreting conflicts over the required design intent of all architectural layouts and architectural elements of construction, it being understood that the integrity and installation of the systems designed by the <i>Consultant</i>, or its sub-<i>Consultants</i> are to remain with each of the applicable drawing disciplines.</p> <p>.8 Should reference standards contained in the <i>Specifications</i> conflict with the <i>Specifications</i>, the <i>Specifications</i> shall govern. Should reference standards and <i>Specifications</i> conflict with each other or if certain requirements of the <i>Specifications</i> conflict with other requirements of the <i>Specifications</i>, the more stringent requirements shall govern.”</p>



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SC8.6	1.1.9	<p><u>Add</u> the following to the end of GC 1.1.9:</p> <p>“The <i>Specifications</i> are divided into divisions and sections for convenience but shall be read as a whole and neither such division nor anything else contained in the <i>Contract Documents</i> will be construed to place responsibility on the <i>Owner</i> or the <i>Consultant</i> to settle disputes among the <i>Subcontractors</i> and <i>Suppliers</i> with respect to such divisions. The <i>Drawings</i> are, in part, diagrammatic and are intended to convey the scope of the <i>Work</i> and indicate general and appropriate locations, arrangements and sizes of fixtures, equipment, outlets and other elements. The <i>Contractor</i> shall obtain more accurate information about the locations, arrangements and sizes from study and coordination of the <i>Drawings</i>, including <i>Shop Drawings</i> and shall become familiar with conditions and spaces affecting those matters before proceeding with the <i>Work</i>. Where site conditions require reasonable minor changes where the change requires only the additional labour two hours or less, the <i>Contractor</i> shall make such changes at no additional cost to the <i>Owner</i>. Similarly, where known conditions or existing conditions interfere with new installation and require relocation, the <i>Contractor</i> shall include such relocation in the <i>Work</i>. The <i>Contractor</i> shall arrange and install fixtures and equipment in such a way as to conserve as much headroom and space as possible. The schedules are those portions of the <i>Contract Documents</i>, wherever located and whenever issued, which compile information of similar content and may consist of drawings, tables and/or lists.”</p>
SC8.7	1.1.13	<p><u>Add</u> new paragraph 1.1.13 as follows:</p> <p>1.1.13 The <i>Contractor</i> shall keep one copy of the current <i>Contract Documents</i>, <i>Supplemental Instructions</i>, contemplated <i>Change Orders</i>, <i>Change Orders</i>, <i>Change Directives</i>, cash allowance disbursement authorizations, reviewed <i>Shop Drawings</i>, submittals, reports and records of meeting at the <i>Place of the Work</i>, in good order and available to the <i>Owner</i> and <i>Consultant</i>.”</p>

**SC9 GC 1.3 RIGHTS AND REMEDIES**

SC9.1	1.3.2	<p>In paragraph 1.3.2 <u>delete</u> the word “No” from the beginning of the paragraph and <u>replace</u> it with the words:</p> <p>“Except with respect to the requirements set out in paragraphs 6.4.1, 6.5.4, 6.6.1 and 8.3.2, no...”</p>
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**SC10 \*NEW\* GC 1.5 EXAMINATION OF DOCUMENTS AND SITE**

SC10.1	1.5	<p><u>Add</u> new GC 1.5 – EXAMINATION OF DOCUMENTS AND SITE as follows:</p> <p><b>“GC 1.5 EXAMINATION OF DOCUMENTS AND SITE</b></p> <p>1.5.1 The <i>Contractor</i> declares and represents that in tendering for the <i>Work</i>, and in entering into a Contract with the <i>Owner</i> for the performance of the <i>Work</i>, it has investigated for itself the character of the <i>Work</i> to be done, based on information generally available from a visit to the <i>Place of the Work</i> and to the standard set out under GC 3.14.1 and further represents and warrants and acknowledges that it considered and took into account in the <i>Contract Price</i> all reasonably known impacts and restrictions arising from the COVID-19 pandemic, including without limitation corresponding legislative changes that may impact performance of the <i>Project</i>, various weather conditions that may affect the <i>Work</i>, the availability of supplies and labour or other conditions or risks that the <i>Contractor</i> knew about or reasonably ought to have known about prior to the date of the <i>Contract</i>. The <i>Contractor</i> has assumed and does hereby assume all risk of known conditions now existing or arising in the course of the <i>Work</i> which might or could make the <i>Work</i>, or any items</p>
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		<p>thereof more expensive in character, or more onerous to fulfil, than was contemplated or known when the tender was made or the <i>Contract</i> signed.</p> <p>1.5.2 The <i>Contractor</i> also declares that prior to commencement of the <i>Work</i>, where in tendering for the <i>Work</i> and in entering into this <i>Contract</i>, the <i>Contractor</i> relied upon information furnished by the <i>Owner</i> or any of its agents or servants respecting the nature or confirmation of the ground at the site of the <i>Work</i>, the <i>Contractor</i> shall review to the standard specified in GC 3.14.1, the accuracy of the information furnished by the <i>Owner</i>. If a condition is materially different than what is stated in the information furnished by the <i>Owner</i>, the <i>Contractor</i> shall, no later than five (5) <i>Working Days</i> after the first observation of such condition(s), deliver to the <i>Owner</i> and to the <i>Consultant</i> a <i>Notice in Writing</i> specifying the materially different condition and the <i>Contractor</i> shall not proceed with the affected part of the <i>Work</i> until receiving written direction from the <i>Owner</i> or the <i>Consultant</i>. Where the <i>Contractor</i> fails to provide prompt <i>Notice in Writing</i> in accordance with this GC 1.5.2, the <i>Contractor</i> expressly waives and releases the <i>Owner</i> from all claims with respect to the said information with respect to the <i>Work</i>.</p>
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**PART 2 ADMINISTRATION OF THE CONTRACT**

**SC11 GC 2.2 ROLE OF THE CONSULTANT**

SC11.1	2.2.5	<p><u>Delete</u> paragraph 2.2.4 and <u>replace</u> it with the following:</p> <p>“2.2.4 Upon receipt of an application for payment that satisfies the requirement of a <i>Proper Invoice</i>, based on the <i>Consultant’s</i> observations and evaluation of the <i>Contractor’s</i> application for payment, the <i>Consultant</i> will determine the amounts owing to the <i>Contractor</i> under the <i>Contract</i> and will issue certificates for payment as provided in Article A-5 - PAYMENT, GC 5.3 - PAYMENT, GC 5.4 SUBSTANTIAL PERFORMANCE OF THE WORK AND PAYMENT OF HOLDBACK, and GC 5.5 - FINAL PAYMENT. If the <i>Consultant</i> determines that the amount payable to the <i>Contractor</i> differs from the amount stated in a <i>Proper Invoice</i>, the <i>Consultant</i> shall notify the <i>Owner</i> as provided in GC 5.3.1.2 and prepare a draft of the applicable <i>Notice of Non-Payment</i> for the amount in dispute.”</p>
SC11.2	2.2.6	<p>In the first sentence of paragraph 2.2.6, <u>delete</u> the words “Except with respect to GC 5.1 – FINANCING INFORMATION REQUIRED OF THE OWNER”.</p>
SC11.3	2.2.12	<p>At paragraph 2.2.12, <u>insert</u> the following at end of that paragraph:</p> <p>“If, in the opinion of the <i>Contractor</i>, the <i>Supplemental Instruction</i> involves an adjustment in the <i>Contract Price</i> or in the <i>Contract Time</i>, it shall, within ten (10) <i>Working Days</i> of receipt of a <i>Supplemental Instruction</i>, provide the <i>Consultant</i> with a notice in writing to that effect. Failure to provide written notification within the time stipulated in this paragraph 2.2.12 shall be deemed an acceptance of the <i>Supplemental Instruction</i> by the <i>Contractor</i>, without any adjustment in the <i>Contract Price</i> or <i>Contract Time</i>.”</p>

**SC12 GC 2.3 REVIEW AND INSPECTION OF THE WORK**

SC12.1	2.3.2	<p><u>Amend</u> paragraph 2.3.2 by <u>adding</u> the words “and <i>Owner</i>” after the words “<i>Consultant</i>” in the second and third lines.</p>
SC12.2	2.3.3	<p><u>Delete</u> paragraph 2.3.3 in its entirety and <u>replace</u> it with the following:</p> <p>“2.3.3 The <i>Contractor</i> shall furnish promptly two copies to the <i>Consultant</i> and one copy to the <i>Owner</i> of all certificates and inspection reports relating to the <i>Work</i>.”</p>



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SC12.3	2.3.4	In paragraph 2.3.4 <u>add</u> the word “review” after the word “inspections” in the first and second lines of paragraph 2.3.4.
SC12.4	2.3.5	In paragraph 2.3.5 in the first line after the word “ <i>Consultant</i> ”, <u>add</u> “or the <i>Owner</i> ”.
SC12.5	2.3.8	<u>Add</u> a new paragraph 2.3.8 as follows:  “2.3.8 The <i>Consultant</i> will conduct periodic reviews of the <i>Work</i> in progress, to determine general conformance with the requirements of the <i>Contract Documents</i> . Such reviews, or lack thereof, shall not give rise to any claims by the <i>Contractor</i> in connection with construction means, methods, techniques, sequences and procedures, nor in connection with construction safety at the <i>Place of Work</i> , responsibility for which belongs exclusively to the <i>Contractor</i> .”

**SC13 GC 2.4 DEFECTIVE WORK**

SC13.1	2.4.1	<u>Amend</u> GC 2.4.1 by inserting “, the <i>Owner</i> and/or its agent” in the first sentence following “rejected by the <i>Consultant</i> ”.
SC13.2	2.4.1.1 to 2.4.1.2	<u>Add</u> new paragraphs 2.4.1.1 and 2.4.1.2 as follows:  “2.4.1.1 The <i>Contractor</i> shall rectify, in a manner acceptable to the <i>Consultant</i> and to the <i>Owner through the Consultant</i> all defective work and deficiencies throughout the <i>Work</i> , whether or not they are specifically identified by the <i>Consultant</i> .  2.4.1.2 The <i>Contractor</i> shall prioritize the correction of any defective work, which, in the sole discretion of the <i>Owner through the Consultant</i> , adversely affects the day to day operations of the <i>Owner</i> or which, in the sole discretion of the <i>Consultant</i> , adversely affects the progress of the <i>Work</i> .”
SC13.3	2.4.2	<u>Delete</u> paragraph 2.4.2 in its entirety and <u>replace</u> it with the following:  “2.4.2 The <i>Contractor</i> shall promptly pay the <i>Owner</i> for costs incurred by the <i>Owner</i> , the <i>Owner’s</i> own forces or the <i>Owner’s</i> other contractors, for work destroyed or damaged or any alterations necessitated by the <i>Contractor’s</i> removal, replacement or re-execution of defective work.”
SC13.4	2.4.4	<u>Add</u> new paragraph 2.4.4 as follows:  “2.4.4 Neither acceptance of the <i>Work</i> by the <i>Consultant</i> or the <i>Owner</i> , nor any failure by the <i>Consultant</i> or the <i>Owner</i> to identify, observe or warn of defective <i>Work</i> or any deficiency in the <i>Work</i> shall relieve the <i>Contractor</i> from the sole responsibility for rectifying such defect or deficiency at the <i>Contractor’s</i> sole cost, even where such failure to identify, observe or warn is negligent.”

**PART 3 EXECUTION OF THE WORK**

**SC14 GC 3.1 CONTROL OF THE WORK**

SC14.1	3.1.2	Amend paragraph 3.1.2 by <u>inserting</u> the words “Construction Schedule” after the word “sequences”.
SC14.2	3.1.3 & 3.1.4	<u>Add</u> new paragraphs 3.1.3 and 3.1.4 as follows:  “3.1.3 Prior to commencing individual procurement, fabrication and construction activities, the <i>Contractor</i> shall verify at the <i>Place of the Work</i> , all relevant measurements and



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		<p>levels necessary for proper and complete fabrication, assembly and installation of the <i>Work</i> and shall further carefully compare such field measurements and conditions with the requirements of the <i>Contract Documents</i>. Where dimensions are not included or exact locations are not apparent, the <i>Contractor</i> shall immediately notify the <i>Consultant</i> in writing and obtain written instructions from the <i>Consultant</i> before proceedings with any part of the affected <i>Work</i>.</p> <p>3.1.4 Notwithstanding the provisions of paragraphs 3.1.1 and 3.1.2, the <i>Owner</i> shall have access to the site at all times to monitor all aspects of construction. Such access shall in no circumstances affect the obligations of the <i>Contractor</i> to fulfill its contractual obligations.”</p>
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**SC15 GC 3.2 CONSTRUCTION BY OWNER OR OTHER CONTRACTORS**

SC15.1	3.2.2.1	<u>Delete</u> subparagraph 3.2.2.1 and <u>replace</u> it with “[Intentionally left blank]”.
SC15.2	3.2.3.2	<p><u>Delete</u> subparagraph 3.2.3.2 and <u>replace</u> it with the following:</p> <p>“.2 co-ordinate and schedule the activities and work of other contractors and the <i>Owner’s</i> own forces, including where other contractors or the <i>Owner’s</i> own forces are used after the <i>Owner</i> and the <i>Contractor</i> cannot reach agreement on the value of a change, with the <i>Work</i> of the <i>Contractor</i> and connect as specified or shown in the <i>Contract Documents</i>.”</p>
SC15.3	3.2.3.4	<u>Delete</u> the period at the end of subparagraph 3.2.3.4 and <u>replace</u> it with a semi-colon.
SC15.4	3.2.3.5	<p><u>Add</u> new subparagraph 3.2.3.5 as follows:</p> <p>“.5 Subject to GC 9.4 CONSTRUCTION SAFETY, for the <i>Owner’s</i> own forces and for other contractors, assume overall responsibility for compliance with all aspects of the applicable health and safety legislation in force at the <i>Place of the Work</i>, including all of the responsibilities of the “constructor”, pursuant to the <i>OHSA</i>.”</p>

**SC16 GC 3.3 TEMPORARY WORK**

SC16.1	3.3.2	In paragraph 3.3.2, in the second line after the words “where required by law”, insert “or by the <i>Consultant</i> ”.
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**SC17 GC 3.4 CONSTRUCTION SCHEDULE**

SC17.1	3.4.1	<p><u>Delete</u> GC 3.4.1 in its entirety and <u>replace</u> it with the following:</p> <p>“3.4.1 The <i>Contractor</i> shall:</p> <p>1 within five (5) calendar days of receiving written confirmation of the award of the <i>Contract</i>, prepare and submit to the <i>Owner</i> and the <i>Consultant</i> for their review and approval, a construction schedule in the format indicated below that indicates the timing of the activities of the <i>Work</i> and provides sufficient detail of the critical events and their inter-relationship to demonstrate the <i>Work</i> will be performed in conformity with the <i>Contract Time</i> and in accordance with the <i>Contract Documents</i>. Such schedule is to include a delivery schedule for <i>Products</i> whose delivery is critical to the schedule for the <i>Work</i> or are required by the <i>Contract</i> to be included in a <i>Products</i> delivery schedule. The <i>Contractor</i> shall employ construction scheduling software, being the latest version of “Microsoft Project”, that permits the progress of the <i>Work</i> to be monitored in relation to the critical path established in the schedule. The <i>Contractor</i> shall provide such schedule and any successor or revised schedules in</p>
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		<p>both original digital file format (e.g., .mpp format for Microsoft Project), portable data file (PDF) format, and hard copy. Once accepted by the <i>Owner</i> and the <i>Consultant</i>, the construction schedule submitted by the <i>Contractor</i> shall become the baseline “<b>Construction Schedule</b>”;</p> <p>.2 provide the expertise and resources, such resources including manpower and equipment, as are necessary on a best efforts basis to maintain progress under the accepted baseline <i>Construction Schedule</i> or revised construction schedule accepted by the <i>Owner</i> pursuant to GC 3.4 CONSTRUCTION SCHEDULE, which includes without limitation, the <i>Contractor’s</i> use of all possible and, if necessary, extraordinary measures, to bring the progress of the <i>Work</i> into compliance with the <i>Construction Schedule</i>, such as (i) increasing the presence of its own forces at the <i>Place of the Work</i>; (ii) directing any <i>Subcontractors</i> or <i>Suppliers</i> to increase their labour forces and equipment; (iii) working overtime and extra shifts; and (iv) providing any additional supervision and coordination of the <i>Project</i>, all at the <i>Contractor’s</i> own cost and expense save and except where GC 6.5.1, 6.5.2, or 6.5.3 apply; and,</p> <p>.3 monitor the progress of the <i>Work</i> on a weekly basis relative to the baseline <i>Construction Schedule</i>, or any revised <i>Construction Schedule</i> accepted by the <i>Owner</i> pursuant to GC 3.4 CONSTRUCTION SCHEDULE, deliver a <i>Construction Schedule Update</i> to the <i>Consultant</i> and <i>Owner</i> with each application for payment, at a minimum, or as may be reasonably required by the <i>Consultant</i> and advise the <i>Consultant</i> and the <i>Owner</i> weekly in writing of any variation from the baseline or slippage in the schedule; and,</p> <p>.4 if after applying the expertise and resources required under paragraph 3.4.1.2, the <i>Contractor</i> forms the opinion that the slippage in schedule reported in paragraph 3.4.1.3 cannot be recovered by the <i>Contractor</i>, it shall, in the same notice provided under paragraph 3.4.1.3, indicate to the <i>Consultant</i> if the <i>Contractor</i> intends to apply for an extension of <i>Contract Time</i> as provided in PART 6 —CHANGES IN THE WORK; and,</p> <p>.5 ensure that the <i>Contract Price</i> shall include all costs required to phase or stage the <i>Work</i>.”</p>
SC17.2	3.4.2	<p><u>Add</u> new GC 3.4.2 and GC 3.4.3 as follows:</p> <p>“3.4.2 If, at any time, it should appear to the <i>Owner</i> or the <i>Consultant</i> that the actual progress of the <i>Work</i> is behind schedule or is likely to become behind schedule, or if the <i>Contractor</i> has given notice of such to the <i>Owner</i> or the <i>Consultant</i> pursuant to GC 3.4.1.3, the <i>Contractor</i> shall, either at the request of the <i>Owner</i> or the <i>Consultant</i>, or following giving notice pursuant to GC 3.4.1.3, take appropriate steps to cause the actual progress of the <i>Work</i> to conform to the schedule or minimize the resulting delay. Within 5 calendar days of the request by the <i>Owner</i> or the <i>Consultant</i> or the notice being given pursuant to GC 3.4.1.3, the <i>Contractor</i> shall produce and present to the <i>Owner</i> and the <i>Consultant</i> a plan demonstrating how the <i>Contractor</i> will recover the performance of the <i>Work</i> to align with the currently approved <i>Construction Schedule</i>.</p> <p>3.4.3 The <i>Contractor</i> shall not amend the <i>Construction Schedule</i> without the prior written consent of the <i>Owner</i>.. Any revisions to the <i>Construction Schedule</i> approved by the <i>Owner</i> shall not be deemed to be an extension of the <i>Contract Time</i>. All requests by the <i>Contractor</i> for a revision to the <i>Construction Schedule</i> that include an extension to the <i>Contract Time</i> must be approved by the <i>Owner</i> through an executed <i>Change Order</i>.”</p>

#### SC18 GC 3.5 SUPERVISION

SC18.1	3.5.1	<u>Delete</u> GC 3.5.1 and <u>replace</u> it with the following:
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		<p>“3.5.1 The <i>Contractor</i> shall employ a competent full-time superintendent, acceptable to the <i>Owner</i> and <i>Consultant</i>, who shall be in full time attendance at the <i>Place of the Work</i> while the <i>Work</i> is being performed. The superintendent shall not be changed by the <i>Contractor</i> without valid reason which shall be provided in writing and shall not be changed without prior consultation with and agreement by the <i>Owner</i> and the <i>Consultant</i>. The <i>Contractor</i> shall replace the superintendent within 7 <i>Working Days</i> of the <i>Owner’s</i> written notification, if the superintendent’s performance is not acceptable to the <i>Owner</i>. The <i>Contractor</i> shall provide the <i>Owner</i> and the <i>Consultant</i> with the names, addresses and telephone numbers of the superintendent referred to in this GC 3.5.1 and other responsible persons who may be contacted for emergency and other reasons during non-working hours. .”</p>
SC18.2	3.5.2	<p><u>Delete</u> GC 3.5.2 and <u>replace</u> it with the following:</p> <p>“3.5.2 The superintendent, and any project manager appointed by the <i>Contractor</i>, shall represent the <i>Contractor</i> at the <i>Place of the Work</i> and shall have full authority to act on written instructions given by the <i>Consultant</i> and/or the <i>Owner</i>. Instructions given to the superintendent or the project manager shall be deemed to have been given to the <i>Contractor</i> and both the superintendent and any project manager shall have full authority to act on behalf of the <i>Contractor</i> and bind the <i>Contractor</i> in matters related to the <i>Contract</i>.”</p>
SC18.3	3.5.3 to 3.5.6	<p><u>Add</u> new GC 3.5.3, 3.5.4, 3.5.5 and 3.5.6 as follows:</p> <p>“3.5.3 The <i>Owner</i> may, at any time during the course of the <i>Work</i>, request the replacement of the appointed representative(s). Immediately upon receipt of the request, the <i>Contractor</i> shall make arrangements to appoint an acceptable replacement, which is approved by the <i>Owner</i>.</p> <p>3.5.4 The supervisory staff assigned to the <i>Project</i> shall also be fully competent to implement efficiently all requirements for scheduling, coordination, field engineering, reviews, inspections and submittals defined in the <i>Specifications</i>, and have a minimum 5 years documented “Superintendent/Project Management” experience.</p> <p>3.5.5 The <i>Consultant and Owner</i> shall reserve the right to review the record of experience and credentials of supervisory staff assigned to the <i>Project</i> prior to commencement of the <i>Work</i>.</p> <p>3.5.6 A superintendent assigned to the <i>Work</i> shall be “Gold Seal Certified” as per the Canadian Construction Association; or a superintendent that can demonstrate the requisite experience and success related to the <i>Project</i> to the sole satisfaction of the <i>Owner</i>.”</p>

**SC19 GC 3.6 SUBCONTRACTORS AND SUPPLIERS**

SC19.1	3.6.1.1	In paragraph 3.6.1.1 <u>add</u> to the end of the second line the words “including any warranties and service agreements which extend beyond the term of the <i>Contract</i> .”
SC19.2	3.6.1.2	In subparagraph 3.6.1.2 after the words “the <i>Contract Documents</i> ” <u>add</u> the words “including any required surety bonding”.
SC19.3	3.6.2	<p><u>Delete</u> paragraph 3.6.2. in its entirety and <u>replace</u> it with the following:</p> <p>“3.6.2 The substitution of any <i>Subcontractor</i> and/or <i>Suppliers</i> after submission of the <i>Contractor’s</i> bid will not be accepted unless a valid reason is given in writing to and approved by the <i>Owner</i>, whose approval may be arbitrarily withheld. The reason for substitution must be provided to the <i>Owner</i> and to the original <i>Subcontractor</i> and/or <i>Supplier</i> and the <i>Subcontractor</i> and/or <i>Supplier</i> shall be given the opportunity to reply</p>



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		to the <i>Contractor</i> and <i>Owner</i> . The <i>Contractor</i> shall be fully aware of the capability of each <i>Subcontractor</i> and/or <i>Supplier</i> included in its bid, including but not limited to technical ability, financial stability and ability to maintain the proposed construction schedule.”
SC19.4	3.6.7, 3.6.8, 3.6.9 & 3.6.10	<p><u>Add</u> new paragraphs 3.6.7, 3.6.8, 3.6.9, and 3.6.10 as follows:</p> <p>“3.6.7 The <i>Contractor</i> represents and warrants that it has confirmed the availability of its <i>Subcontractors</i> for the <i>Project</i> and, in particular, for the performance of their respective portions of the <i>Work</i> to ensure completion of the <i>Project</i> within the <i>Contract Price</i> and the <i>Contract Time</i>.</p> <p>3.6.8 The <i>Consultant</i> or the <i>Owner</i>, acting reasonably, may from time to time require the <i>Contractor</i> to remove from the <i>Project</i> any personnel of the <i>Contractor</i>, including project managers, superintendents or <i>Subcontractors</i>. Such persons shall be replaced by the <i>Contractor</i> in a timely fashion to the satisfaction of the <i>Consultant</i> or the <i>Owner</i>, as the case may be, at no cost to the <i>Owner</i>.</p> <p>3.6.9 Where provided in the <i>Contract</i>, the <i>Owner</i> may assign to the <i>Contractor</i>, and the <i>Contractor</i> agrees to accept, any contract procured by the <i>Owner</i> for <i>Work</i> or services required on the <i>Project</i> that has been pre-tendered or pre-negotiated by the <i>Owner</i>, and upon such assignment, the <i>Owner</i> shall have no further liability to any party for such contract.</p> <p>3.6.10 The <i>Contractor</i> covenants that each subcontract or supply contract which the <i>Contractor</i> enters into for the purpose of performing the <i>Work</i> shall expressly provide for the assignment thereof to the <i>Owner</i> (at the option of the <i>Owner</i>) and the assumption by the <i>Owner</i> of the obligations of the <i>Contractor</i> thereunder, upon the termination of the <i>Contract</i> and upon written notice by the <i>Owner</i> to the other parties to such subcontracts or supply contracts, without the imposition of further terms or conditions; provided, however, that until the <i>Owner</i> has given such notice, nothing herein contained shall be deemed to create any contractual or other liability upon the <i>Owner</i> for the performance of obligations under such subcontracts or supply contracts and the <i>Contractor</i> shall be fully responsible for all of its obligations and liabilities (if any) under such subcontracts and supply contracts.”</p>

**SC20 GC 3.7 LABOUR AND PRODUCTS**

SC20.1	3.7.1	<u>Amend</u> paragraph 3.7.1 by <u>adding</u> the words, “..., agents, <i>Subcontractors</i> and <i>Suppliers</i> ...” after the word “employees” in the first line.
SC20.2	3.7.2	<p><u>Delete</u> paragraph 3.7.2 and <u>substitute</u> with the following:</p> <p>“3.7.2 <i>Products</i> provided shall be new and shall conform to all current applicable specifications of the Canadian Standards Association, Canadian Standards Board or General Standards Board, ASTM, National Building Code, provincial and municipal building codes, fire safety standards, and all governmental authorities and regulatory agencies having jurisdiction at the <i>Place of the Work</i>, unless otherwise specified. <i>Products</i> which are not specified shall be of a quality consistent with those specified and their use acceptable to the <i>Consultant</i>. <i>Products</i> brought on to the <i>Place of the Work</i> by the <i>Contractor</i> shall be deemed to be the property of the <i>Owner</i>, but the <i>Owner</i> shall be under no liability for loss thereof or damage thereto arising from any cause whatsoever. The said <i>Products</i> shall be at the sole risk of the <i>Contractor</i>. Workmanship shall be, in every respect, first class and the <i>Work</i> shall be performed in accordance with the best modern industry practice.”</p>
SC20.3	3.7.4 to 3.7.8	<u>Add</u> new paragraphs 3.7.4, 3.7.5, 3.7.6, 3.7.7, and 3.7.8 as follows:



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		<p>“3.7.4 Upon receipt of a <i>Notice in Writing</i> from the <i>Owner</i>, the <i>Contractor</i> shall immediately remove from the <i>Place of the Work</i>, tradesmen and labourers or anyone whose conduct jeopardizes the safety of the <i>Owner’s</i> operations or who are considered by the <i>Owner</i> or the <i>Consultant</i> to be unskilled or otherwise objectionable. Immediately upon receipt of the request, the <i>Contractor</i> shall make arrangements to appoint an acceptable replacement.</p> <p>3.7.5 The <i>Contractor</i> shall cooperate with the <i>Owner</i> and its representatives and shall take all reasonable and necessary actions to maintain stable and harmonious labour relations with respect to the <i>Work</i> at the <i>Place of the Work</i>, including cooperation to attempt to avoid <i>Work</i> stoppages, trade union jurisdictional disputes and other <i>Labour Disputes</i>. Any costs arising from labour disputes shall be at the sole expense of the <i>Contractor</i>.</p> <p>3.7.6 The cost for overtime required beyond the normal <i>Working Day</i> to complete individual construction operations of a continuous nature, such as pouring or finishing of concrete or similar work, or <i>Work</i> that the <i>Contractor</i> elects to perform at overtime rates without the <i>Owner</i> requesting it, shall not be chargeable to the <i>Owner</i>.</p> <p>3.7.7 All manufactured <i>Products</i> which are identified by their proprietary names or by part or catalogue number in the <i>Specifications</i> shall be used by the <i>Contractor</i>. No substitutes for such specified <i>Products</i> shall be used without the written approval of the <i>Owner</i> and the <i>Consultant</i>. Substitutes will only be considered by the <i>Consultant</i> when submitted in sufficient time to permit proper review and investigation. When requesting approval for the use of substitutes, the <i>Contractor</i> shall include in its submission any proposed change in the <i>Contract Price</i>. The <i>Contractor</i> shall use all proprietary <i>Products</i> in strict accordance with the manufacturer’s directions. Where there is a choice of proprietary <i>Products</i> specified for one use, the <i>Contractor</i> may select any one of the <i>Products</i> so specified for this use.</p> <p>3.7.8 Materials, appliances, equipment and other <i>Products</i> are sometimes specified by reference to brand names, proprietary names, trademarks or symbols. In such cases, the name of a manufacturer, distributor, <i>Supplier</i> or dealer is sometimes given to assist the <i>Contractor</i> to find a source <i>Supplier</i>. This shall not relieve the <i>Contractor</i> from its responsibility from finding its own source of supply even if the source names no longer supplies the <i>Product</i> specified. If the <i>Contractor</i> is unable to obtain the specified <i>Product</i>, the <i>Contractor</i> shall supply a substitute product equal to or better than the specified <i>Product</i>, as approved by the <i>Consultant</i> with no extra compensation. Should the <i>Contractor</i> be unable to obtain a substitute <i>Product</i> equal to or superior to the specified <i>Product</i> and the <i>Owner</i> accepts a different <i>Product</i>, the <i>Contract Price</i> shall be adjusted accordingly, as approved by the <i>Consultant</i>.”</p>
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**SC21 GC 3.8 SHOP DRAWINGS**

SC21.1	3.8.1	<p><u>Delete</u> paragraph 3.8.1 in its entirety and <u>replace</u> with the following:</p> <p>“3.8.1 The <i>Contractor</i> shall provide shop drawings as described in the <i>Contract Documents</i> and as the <i>Consultant</i> may reasonably request.”</p>
SC21.2	3.8.3	<p><u>Delete</u> paragraph 3.8.3 and <u>replace</u> it with the following:</p> <p>“3.8.3 The <i>Contractor</i> shall prepare a <i>Shop Drawings</i> schedule acceptable to the <i>Owner</i> and the <i>Consultant</i> prior to the first application for payment. A draft of the proposed <i>Shop Drawings</i> schedule shall be submitted by the <i>Contractor</i> to the <i>Consultant</i> and the <i>Owner</i> for approval. The draft <i>Shop Drawings</i> schedule shall clearly indicate the phasing of <i>Shop Drawings</i> submissions. The <i>Contractor</i> shall</p>



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		periodically re-submit the <i>Shop Drawings</i> schedule to correspond to changes in the <i>Construction Schedule</i> .”
SC21.3	3.8.5	<u>Delete</u> paragraph 3.8.5 in its entirety and <u>substitute</u> the following:  “3.8.5 At the time of providing <i>Shop Drawings</i> , the <i>Contractor</i> shall advise the <i>Consultant</i> in writing of any deviations in <i>Shop Drawings</i> from the requirements of the <i>Contract Documents</i> . The <i>Consultant</i> shall indicate the acceptance of such deviation expressly in writing. Where manufacturers’ literature is submitted in lieu of scaled drawings, it shall be clearly marked in ink, to indicate the specific items for which review is requested.”
SC21.4	3.8.8 to 3.8.12	<u>Add</u> new paragraphs 3.8.8, 3.8.9, 3.8.10, 3.8.11, and 3.8.12 as follows:  “3.8.8 Reviewed <i>Shop Drawings</i> shall not authorize a change in the <i>Contract Price</i> and/or the <i>Contract Time</i> .  3.8.9 Except where the parties have agreed to a different <i>Shop Drawings</i> schedule pursuant to paragraph 3.10.3, the <i>Contractor</i> shall comply with the requirements for <i>Shop Drawings</i> submissions stated in the <i>Specifications</i> .  3.8.10 The <i>Contractor</i> shall not use the term “by others” on <i>Shop Drawings</i> or other submittals. The related trade, <i>Subcontractor</i> or <i>Supplier</i> shall be stated.  3.8.11 Certain <i>Specifications</i> sections require the <i>Shop Drawings</i> to bear the seal and signature of a professional engineer. Such professional engineer must be registered in the jurisdiction of the <i>Place of the Work</i> and shall have expertise in the area of practice reflected in the <i>Shop Drawings</i> .  3.8.12 The <i>Consultant</i> will review and return <i>Shop Drawings</i> and submittals in accordance with the schedule agreed upon in paragraph 3.10.3, The <i>Contractor</i> shall allow the <i>Consultant</i> a minimum of 10 <i>Working Days</i> to review <i>Shop Drawings</i> from the date of receipt. If resubmission of <i>Shop Drawings</i> is required, a further 10 <i>Working Day</i> period is required for the <i>Consultant’s</i> review.”

**SC22 \*NEW\* GC 3.9 USE OF THE WORK**

SC22.1	GC 3.9	<u>Add</u> new GC 3.9 – USE OF THE WORK as follows:  “ <b>GC 3.9 USE OF THE WORK</b>  3.9.1 The <i>Contractor</i> shall confine <i>Construction Equipment</i> , <i>Temporary Work</i> , storage of <i>Products</i> , waste products and debris, and operations of employees and <i>Subcontractors</i> to limits indicated by laws, ordinances, permits, by the direction of the <i>Owner</i> or the <i>Consultant</i> , or the <i>Contract Documents</i> and shall not unreasonably encumber the <i>Place of the Work</i> .  3.9.2 The <i>Contractor</i> shall not load or permit to be loaded any part of the <i>Work</i> with a weight or force that will endanger the safety of the <i>Work</i> .  3.9.3 The <i>Owner</i> shall have the right to enter or occupy the <i>Place of the Work</i> in whole or in part for the purpose of placing fittings and equipment, or for other use before <i>Substantial Performance of the Work</i> , if, in the opinion of the <i>Consultant</i> , such entry and occupation does not prevent or substantially interfere with the <i>Contractor</i> in the performance of the <i>Contract</i> within the <i>Contract Time</i> . Such entry or occupation shall neither be considered as acceptance of the <i>Work</i> or in any way relieves the <i>Contractor</i> from its responsibility to complete the <i>Contract</i> .”
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**SC23 \*NEW\* GC 3.10 CUTTING AND REMEDIAL WORK**

SC23.1	GC 3.10	<p><u>Add</u> new GC 3.10 – CUTTING AND REMEDIAL WORK as follows:</p> <p><b>“GC 3.10 CUTTING AND REMEDIAL WORK</b></p> <p>3.10.1 The <i>Contractor</i> shall perform the cutting and remedial work required to make the affected parts of the <i>Work</i> come together properly. Such cutting and remedial work shall be performed by specialists familiar with the <i>Products</i> affected and shall be performed in a manner to neither damage nor endanger the <i>Work</i>.</p> <p>3.10.2 The <i>Contractor</i> shall coordinate the <i>Work</i> to ensure all cutting and remedial work required is kept to a minimum.</p> <p>3.10.3 Unless specifically stated otherwise in the <i>Specifications</i>, the <i>Contractor</i> shall do all cutting and making good necessary for the proper installation and performance of the <i>Work</i>.</p> <p>3.10.4 To avoid unnecessary cutting, the <i>Contractor</i> shall lay out its work and advise the <i>Subcontractors</i>, when necessary, where to leave holes for installation of pipes and other work.”</p>
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**SC24 \*NEW\* GC 3.11 CLEAN UP**

SC24.1	3.11.1, 3.11.2, 3.11.3, 3.11.4, 3.11.5 & 3.11.6	<p>Add new paragraphs 3.11.1, 3.11.2, 3.11.3, 3.11.4, 3.11.5, and 3.11.6 as follows:</p> <p>“3.11.1 The <i>Contractor</i> shall maintain the <i>Work</i> in a safe and tidy condition and free from the accumulation of waste products and debris, other than that caused by the <i>Owner</i>, other contractors or their employees. The <i>Contractor</i> shall remove accumulated waste and debris at least once a week as a minimum or as required by the nature of the <i>Work</i>.</p> <p>3.11.2 Before applying for <i>Substantial Performance of the Work</i>, the <i>Contractor</i> shall remove waste products and debris, other than that resulting from the work of the <i>Owner</i>, other contractors or their employees, and shall leave the <i>Place of the Work</i> clean and suitable for use or occupancy by the <i>Owner</i>. The <i>Contractor</i> shall remove products, tools, materials, <i>Construction Equipment</i>, and <i>Temporary Work</i> not required for the performance of the remaining work.</p> <p>3.11.3 As a condition precedent to submitting its application for final payment, the <i>Contractor</i> shall remove any remaining products, tools, materials, <i>Construction Equipment</i>, <i>Temporary Work</i>, and waste products and debris, other than those resulting from the work of the <i>Owner</i>, other contractors or their employees.</p> <p>3.11.4 The <i>Contractor</i> shall clean up garbage during and after construction and maintain the <i>Place of the Work</i> in a neat and orderly condition on a daily basis. Prior to leaving the <i>Place of the Work</i> and following completion of the <i>Work</i>, the <i>Contractor</i> shall make good all damage to the building and its components caused by the performance of the <i>Work</i> or by any <i>Subcontractor</i> or <i>Supplier</i>. The <i>Contractor</i> shall leave the <i>Place of the Work</i> in a clean and finished state; remove all <i>Construction Equipment</i> and materials; remove all paint, stains, labels, dirt, etc. from the <i>Place of the Work</i>; and touch up all damaged painted areas (if applicable). The <i>Contractor</i> shall be responsible for restoring those areas of the <i>Place of the Work</i>, impacted by the <i>Work</i>, to their original condition.”</p>
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		<p>3.11.5 Without limitation to or waiver of the <i>Owner's</i> other rights and remedies, the <i>Owner</i> shall have the right to back charge to the <i>Contractor</i> the cost of damage to the site caused by transportation in and out of the <i>Place of the Work</i> by the <i>Contractor</i>, <i>Subcontractors</i> or <i>Suppliers</i>, if not repaired before final payment.</p> <p>3.11.6 The <i>Contractor</i> shall dispose of debris at a location and in a manner acceptable to the <i>Owner</i> (and to the authorities having jurisdiction at the <i>Place of the Work</i> and at the disposal area) and the <i>Contractor</i> shall cover containers with tarpaulins.”</p>
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#### SC25 \*NEW\* GC 3.12 EXCESS SOIL MANAGEMENT

SC25.1	GC 3.12	<p><u>Add</u> new GC 3.12 – EXCESS SOIL MANAGEMENT as follows:</p> <p><b>“GC 3.12 EXCESS SOIL MANAGEMENT</b></p> <p>3.12.1 The <i>Contractor</i> shall be solely responsible for the proper management of all <i>Excess Soil</i> at the <i>Place of the Work</i> and for performance of the <i>Work</i> in compliance with the rules, regulations and practices required by the <i>Excess Soil Regulation</i> until such time as <i>Ready-for-Takeover</i> is achieved. Without restricting the generality of the previous sentence, the <i>Contractor's</i> responsibility under this GC 3.12 includes the designation, transportation, tracking, temporary and/or final placement, record keeping, and reporting of all <i>Excess Soil</i> in connection with the <i>Work</i> all in compliance with the <i>Excess Soil Regulation</i>.</p> <p>3.12.3 The <i>Contractor</i> shall indemnify and save harmless the <i>Owner</i>, their agents, officers, directors, administrators, employees, consultants, successors and assigns from and against the consequences of any and all health and safety infractions committed directly by the <i>Contractor</i>, or those for whom it is responsible at law, under the <i>Excess Soil Regulation</i>, or any environmental protection legislation, including the payment of legal fees and disbursements on a substantial indemnity basis. Such indemnity shall apply to the extent to which the <i>Owner</i> is not covered by insurance.”</p>
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#### SC26 \*NEW\* GC 3.13 CONTRACTOR STANDARD OF CARE

SC26.1	3.13	<p><u>Add</u> a new GC 3.13 – CONTRACTOR STANDARD OF CARE as follows:</p> <p><b>“GC 3.13 CONTRACTOR STANDARD OF CARE</b></p> <p>“3.13.1 In performing its services and obligations under the <i>Contract</i>, the <i>Contractor</i> shall exercise the standard of care, skill and diligence that would normally be provided by an experienced and prudent contractor supplying similar services for similar projects. The <i>Contractor</i> acknowledges and agrees that throughout the <i>Contract</i>, the performance of the <i>Contractor's</i> obligations, duties and responsibilities shall be interpreted in accordance with this standard. The <i>Contractor</i> shall exercise the same standard of care, skill and diligence in respect of any <i>Products</i>, personnel or procedures which it may recommend to the <i>Owner</i> or employ on the <i>Project</i>.</p> <p>3.13.2 The <i>Contractor</i> further represents, covenants and warrants to the <i>Owner</i> that:</p> <ol style="list-style-type: none"> <li>.1 the personnel it assigns to the <i>Project</i> are appropriately experienced;</li> <li>.2 it has a sufficient staff of qualified and competent personnel to replace any of its appointed representatives, subject to the <i>Owner's</i> approval, in the event of death, incapacity, removal or resignation; and</li> </ol>
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		.3 there are no pending, threatened or anticipated claims, liabilities or contingent liabilities that would have a material effect on the financial ability of the <i>Contractor</i> to perform its work under the <i>Contract</i> .”
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**PART 4 ALLOWANCES**

**SC27 GC 4.1 CASH ALLOWANCES**

SC27.1	4.1.3	In GC 4.1.3 <u>delete</u> the words “through the <i>Consultant</i> ” and <u>replace</u> them with “in writing.”
SC27.2	4.1.4	<u>Delete</u> GC 4.1.4 in its entirety and <u>replace</u> it with the following:  “4.1.4 Where the actual cost of the <i>Work</i> under any cash allowance exceeds the amount of the allowance, any unexpended amounts from other cash allowances shall be reallocated, by the <i>Consultant</i> at the <i>Owner’s</i> direction, to cover the shortfall, and, in that case, there shall be no additional amount added to the <i>Contract Price</i> for overhead and profit. Only where the actual cost of the <i>Work</i> under all cash allowances exceeds the total amount of all cash allowances shall the <i>Contractor</i> be compensated for the excess incurred and substantiated, plus an amount for overhead and profit on the excess only, as set out in the <i>Contract Documents</i> .”
SC27.3	4.1.7	<u>Delete</u> GC 4.1.7 in its entirety and <u>replace</u> it with the following:  “4.1.7 The net amount of any unexpended cash allowances, after providing for any reallocations as contemplated in paragraph 4.1.4, shall be deducted from the <i>Contract Price</i> by <i>Change Order</i> without any adjustment for the <i>Contractor’s</i> overhead and profit on such amount.”
SC27.4	4.1.8 and 4.1.9	<u>Add</u> new GC 4.1.8 and 4.1.9 as follows:  “4.1.8 The <i>Owner</i> reserves the right to call, or to have the <i>Contractor</i> call, for competitive bids for portions of the <i>Work</i> to be paid for from cash allowances.  4.1.9 Cash allowances cover the net cost to the <i>Contractor</i> of services, <i>Products</i> , <i>Construction Equipment</i> , freight, unloading, handling, storage, installation, provincial sales tax, and other authorized expenses incurred in performing any <i>Work</i> stipulated under the cash allowances but does not include any <i>Value Added Taxes</i> payable by the <i>Owner</i> and the <i>Contractor</i> .”

**PART 5 PAYMENT**

**SC28 GC 5.1 FINANCING INFORMATION REQUIRED OF THE OWNER**

SC28.1	5.1	<u>Delete</u> GC 5.1 – FINANCING INFORMATION REQUIRED OF THE OWNER and all paragraphs thereunder, including any reference to GC 5.1 throughout the <i>Contract</i> .
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**SC29 GC 5.2 APPLICATIONS FOR PAYMENT**

SC29.1	5.2.1	<u>Delete</u> GC 5.2.1 and <u>replace</u> it with the following:  “5.2.1 Upon execution of the <i>Contract</i> , and in any event prior to the <i>Contractor</i> submitting its first application for payment, the <i>Owner</i> shall issue a purchase order to the <i>Contractor</i> for the performance of the <i>Contract</i> . The number indicated on such purchase order must be clearly identifiable on all applications for payment.
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		<p>Applications for payment shall be dated the last day of each month or an alternative day of each month agreed to in writing by the parties, with each month representing one payment period under the <i>Contract</i> (each a “<b>Payment Period</b>”). Within 3 calendar days of the end of each <i>Payment Period</i>, the <i>Contractor</i> will submit a draft application for payment to the <i>Owner</i> and the <i>Consultant</i>. Upon receipt of the draft application for payment, and within 7 calendar days, a representative of each of the <i>Contractor</i>, <i>Owner</i>, and the <i>Consultant</i> shall attend a meeting to discuss and review the work completed during the <i>Payment Period</i>, including quantities, if applicable (the “<b>Pre-Invoice Submission Meeting</b>”). In the event that the scheduled date for the <i>Pre-Invoice Submission Meeting</i> is not a <i>Working Day</i>, the <i>Pre-Invoice Submission Meeting</i> shall occur on the next <i>Working Day</i>. The <i>Contractor</i> shall bring with it to the <i>Pre-Invoice Submission Meeting</i> the following:</p> <ul style="list-style-type: none"> <li>.1 a copy of the draft application for payment;</li> <li>.2 any documents the <i>Contractor</i> is required to bring to the <i>Pre-Invoice Submission Meeting</i> as stipulated in the <i>Contract Documents</i> or as reasonably requested by the <i>Owner</i>; and</li> <li>.3 any other documents reasonably requested, in advance, by the <i>Owner</i> or the <i>Consultant</i>.”</li> </ul>
SC29.2	5.2.2	<p><u>Delete</u> GC 5.2.2 in its entirety and <u>replace</u> it with the following:</p> <p>“5.2.2 Applications for payment shall be given in accordance with the following requirements:</p> <ul style="list-style-type: none"> <li>.1 Within 5 calendar days following the <i>Pre-Invoice Submission Meeting</i>, the <i>Contractor</i> shall deliver its application for payment to the <i>Owner</i> and to the <i>Consultant</i> for <i>Work</i> performed during the <i>Payment Period</i> (“<b>Proper Invoice Submission Date</b>”) subject to the following: <ul style="list-style-type: none"> <li>.1 if the fifth calendar day following the <i>Pre-Invoice Submission Meeting</i>, to which an invoice relates falls on a day that is not a <i>Working Day</i>, the <i>Proper Invoice Submission Date</i> shall be deemed to fall on the next <i>Working Day</i>.</li> </ul> </li> <li>.2 The application for payment must be delivered to the <i>Owner/WCDSB Lead</i> and to the <i>Consultant</i> in the same manner as a <i>Notice in Writing</i> during the hours of 9:00 am to 4:00pm (EST) on the <i>Proper Invoice Submission Date</i>. Delivery to the <i>Owner</i> shall be to the following email address:</li> <li>.3 If an application for payment is received after 4:00 p.m. (EST) on the applicable <i>Proper Invoice Submission Date</i>, the application for payment will not be considered or reviewed by the <i>Owner</i> and <i>Consultant</i> until the next <i>Proper Invoice Submission Date</i>. Notwithstanding the foregoing, the <i>Owner</i> in its sole and absolute discretion may elect to accept an application for payment submitted after 4:00 p.m. on the applicable <i>Proper Invoice Submission Date</i>; however, such acceptance shall not be construed as a waiver of any of its rights or waive or release the <i>Contractor</i>’s obligations to strictly comply with the requirements prescribed in this subparagraph 5.2.2.3.</li> <li>.4 No applications for payment shall be accepted by the <i>Owner</i> prior to the <i>Proper Invoice Submission Date</i>.</li> <li>.5 All applications for payment shall include all of the requirements for a <i>Proper Invoice</i> prescribed by the <i>Construction Act</i> and this <i>Contract</i> and be dated the last day of the applicable <i>Payment Period</i>,”</li> </ul>



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SC29.3	5.2.3	<p><u>Delete</u> GC 5.2.3 and <u>replace</u> it with the following:</p> <p>“5.2.3 The amount claimed shall be for the value, proportionate to the amount of the <i>Contract</i>, of <i>Work</i> performed and <i>Products</i> delivered and incorporated into the <i>Work</i> as of the last date of the applicable <i>Payment Period</i>. Materials may also be deemed to be supplied to an improvement, for payment purposes, when, in the <i>Owner’s</i> opinion, they are placed and properly secured on the land on which the improvement is made, or placed upon land designated by the <i>Owner</i> or agent of the <i>Owner</i>, but placing the materials on the land so designated does not, of itself, make that land subject to a lien. No amount claimed shall include products delivered and incorporated into the work, unless the products are free and clear of all security interests, liens and other claims of third parties. No amount claimed shall include <i>Products</i> delivered to the <i>Place of the Work</i> unless the <i>Products</i> are free and clear of all security interests, liens, and other claims of third parties.”</p>
SC29.4	5.2.4	After the word “ <i>Consultant</i> ” in GC 5.2.4 <u>add</u> the words “and the <i>Owner</i> ”
SC29.5	5.2.5	After the word “ <i>Consultant</i> ” in GC 5.2.5 <u>add</u> the words “or the <i>Owner</i> ”.
SC29.6	5.2.6	In GC 5.2.6, <u>delete</u> the word “ <i>Consultant</i> ” and <u>replace</u> it with “ <i>Owner</i> ”.
SC29.7	5.2.9	<p><u>Add</u> new 5.2.9 as follows:</p> <p>“5.2.9 The <i>Contractor</i> shall prepare and maintain current as-built drawings which shall consist of the <i>Drawings</i> and <i>Specifications</i> revised by the <i>Contractor</i> during the <i>Work</i>, showing changes to the <i>Drawings</i> and <i>Specifications</i>, which current as-built drawings shall be maintained by the <i>Contractor</i> and made available to the <i>Consultant</i> for review with each application for progress payment. The <i>Consultant</i> shall recommend to the <i>Owner</i> that the <i>Owner</i> retain a reasonable amount for the value of the as-built drawings not presented for review.”</p>

**SC30 GC 5.3 PAYMENT**

SC30.1	5.3.1	<p><u>Delete</u> GC 5.3.1 in its entirety, including all subparagraphs thereunder, and <u>replace</u> it with the following:</p> <p>“5.3.1 After receipt by the <i>Owner</i> and the <i>Consultant</i> of an application for payment submitted by the <i>Contractor</i> in accordance with GC 5.2 - APPLICATIONS FOR PAYMENT:</p> <p style="padding-left: 40px;">.1 the <i>Consultant</i> will either:</p> <p style="padding-left: 80px;">(a) issue to the <i>Owner</i> with a copy to the <i>Contractor</i>, a progress payment certificate in the amount applied for by the <i>Contractor</i> in the <i>Proper Invoice</i>, or</p> <p style="padding-left: 80px;">(b) issue to the <i>Owner</i>, with a copy to the <i>Contractor</i>, a certificate for payment for an amount determined by the <i>Consultant</i> to be properly due to the <i>Contractor</i> after applying any credits, withheld amounts, or other set-offs which the <i>Consultant</i> has determined that the <i>Owner</i> is entitled to notwithstanding any notice of dispute or disagreement that the <i>Contractor</i> may have served, along with the <i>Consultant’s</i> reasons why an amount other than what is claimed in the <i>Proper Invoice</i> is properly due to the <i>Contractor</i>, which finding the <i>Owner</i> may accept or amend prior to the <i>Owner</i> issuing a <i>Notice of Non-Payment</i>, if any, in accordance with GC 5.3.2;</p>
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		<p>.2 the <i>Owner</i> shall make payment to the <i>Contractor</i> on account as provided in Article A-5 PAYMENT,</p> <p>(a) in the amount stated in the certificate for payment, or</p> <p>(b) in the amount stated in the certificate for payment less such amount stated in the <i>Owner's Notice of Non-Payment</i> issued pursuant to GC 5.3.3,</p> <p>on the 28th calendar day after receipt of a <i>Proper Invoice</i>, unless such 28th calendar day lands on a day that is other than a <i>Working Day</i>, in which case payment shall be made on the next <i>Working Day</i> after such 28th day.”</p>
SC30.2	5.3.2 to 5.3.7	<p><u>Add</u> new paragraphs 5.3.2, 5.3.3, 5.3.4, 5.3.4, 5.3.5, 5.3.6, and 5.3.7 as follows:</p> <p>5.3.2 All payments to the <i>Contractor</i> shall be processed using electronic funds transfer (“<b>EFT</b>”) and deposited directly to the <i>Contractor's</i> bank account unless agreed to otherwise by the <i>Contractor</i> and the <i>Owner</i> in writing. Prior to the <i>Contractor</i> submitting its first application for payment, the <i>Owner</i> and the <i>Contractor</i> shall exchange such information as is necessary to facilitate <i>EFT</i> payments.</p> <p>5.3.3 In the event that the application for payment delivered by the <i>Contractor</i> pursuant to GC 5.2 - APPLICATIONS FOR PAYMENT does not include the requirements for a <i>Proper Invoice</i> or where the <i>Owner</i> disputes the amount claimed as payable in the <i>Proper Invoice</i>, then the <i>Owner</i> shall within 14 calendar days of receipt of the application for payment, issue a <i>Notice of Non-Payment</i> (Form 1.1).</p> <p>5.3.4 Where the <i>Owner</i> has delivered a <i>Notice of Non-Payment</i>, the <i>Owner</i> and the <i>Contractor</i> shall first engage in good faith negotiations to resolve the dispute. If within 5 calendar days following the issuance of a <i>Notice of Non-Payment</i>, despite good faith efforts by both parties and the assistance of the <i>Consultant</i>, the <i>Owner</i> and the <i>Contractor</i> cannot resolve the dispute, either party may commence an <i>Adjudication</i> in accordance with the procedures set out in the <i>Construction Act</i>. Any portion of the <i>Proper Invoice</i> which is not the subject of the <i>Notice of Non-Payment</i> shall be payable within the time period set out in GC 5.3.1.2.</p> <p>5.3.5 Provided that the <i>Owner</i> complies with its obligations under the <i>Construction Act</i>, and subject to any interim determination of an adjudicator in accordance with any <i>Adjudication</i>, and where applicable, a final determination made in accordance with the dispute resolution processes prescribed by this <i>Contract</i>, the <i>Owner</i> shall be entitled to claim in a <i>Notice of Non-Payment</i> a right to deduct from or, set off against, any payment of the <i>Contract Price</i>:</p> <p>.1 any amount expended by the <i>Owner</i> in exercising the <i>Owner's</i> rights under this <i>Contract</i> to perform any of the <i>Contractor's</i> obligations that the <i>Contractor</i> has failed to perform;</p> <p>.2 any damages, costs or expenses (including, without limitation, reasonable legal fees and expenses) incurred by the <i>Owner</i> as a result of the failure of the <i>Contractor</i> to perform any of its obligations under the <i>Contract</i>;</p> <p>.3 any other amount owing from the <i>Contractor</i> to the <i>Owner</i> under this <i>Contract</i>.</p> <p>5.3.6 The amounts disputed and described under the <i>Notice of Non-Payment</i> shall be held by the <i>Owner</i> until all disputed amounts of the <i>Proper Invoice</i> have been resolved pursuant to PART 8 – DISPUTE RESOLUTION.</p> <p>5.3.7 The <i>Contractor</i> represents, warrants, and covenants to the <i>Owner</i> that it is familiar with its prompt payment and trust obligations under the <i>Construction Act</i> and will</p>



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		take all required steps and measures to ensure that it complies with the applicable prompt payment and trust provisions under the <i>Construction Act</i> including, without limitation, section 8.1 of the <i>Construction Act</i> . Evidence of the <i>Contractor's</i> compliance under this GC 5.3.7, including evidence demonstrating that all <i>EFTs</i> by the <i>Owner</i> to the <i>Contractor</i> are kept in a bank account in the <i>Contractor's</i> name will be made available to the <i>Owner</i> within 5 <i>Working Days</i> following receipt by the <i>Contractor</i> of a <i>Notice in Writing</i> making such request.”
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**SC31 GC 5.4 SUBSTANTIAL PERFORMANCE OF THE WORK- AND PAYMENT OF HOLDBACK**

SC31.1	GC 5.4	<p><del>Delete GC 5.4 – SUBSTANTIAL PERFORMANCE OF THE WORK AND PAYMENT OF HOLDBACK in its entirety and <u>replace</u> it with the following:</del></p> <p><b>“GC 5.4 SUBSTANTIAL PERFORMANCE OF THE WORK AND PAYMENT OF HOLDBACK</b></p> <p>5.4.1 When the <i>Contractor</i> considers that <i>Substantial Performance of the Work</i> has been achieved, the <i>Contractor</i> shall prepare and submit to the <i>Consultant</i> and the <i>Owner</i> a comprehensive deficiency list of items to be completed or corrected, including any incomplete <i>Close-Out Documentation</i>, and apply for a review by the <i>Consultant</i> and the <i>Owner</i> to establish <i>Substantial Performance of the Work</i>. Failure to include an item on the list does not alter the responsibility of the <i>Contractor</i> to complete the <i>Contract</i>.</p> <p>5.4.2 Prior to, or as part of its written application for <i>Substantial Performance of the Work</i> the <i>Contractor</i> shall submit to the <i>Consultant</i> submit to the <i>Consultant</i> all closeout documentation required by the <i>Contract Documents</i>, including but not limited to, warranties, manuals, guarantees, as-built drawings and all other relevant literature from suppliers and manufacturers including, but not limited to, where applicable (the <b>“Close-Out Documentation”</b>):</p> <ul style="list-style-type: none"> <li>.1 equipment, maintenance, and operations manuals;</li> <li>.2 equipment specifications, data sheets and brochures, parts lists and assembly drawings, performance curves and other related data;</li> <li>.3 line drawings, value charts and control sheets sequences with description of the sequence of operations;</li> <li>.4 warranty documents;</li> <li>.5 guarantees;</li> <li>.6 certificates;</li> <li>.7 service and maintenance reports;</li> <li>.8 <i>Specifications</i>;</li> <li>.9 <i>Shop Drawings</i>;</li> <li>.10 coordination drawings;</li> <li>.11 testing and balancing results and reports;</li> <li>.12 <i>Commissioning</i> and quality assurance documentation;</li> <li>.13 distribution system diagrams;</li> <li>.14 spare parts;</li> <li>.15 samples;</li> <li>.16 existing reports and correspondence from authorities having jurisdiction in the <i>Place of the Work</i>;</li> <li>.17 inspection certificates;</li> <li>.18 red-lined record drawings from the construction trailer in two copies and</li> <li>.19 other materials or documentation required to be submitted under the <i>Contract</i>.</li> </ul> <p>5.4.3 The <i>Consultant</i> will review the <i>Work</i> to verify the validity of the application and shall promptly, and in any event, no later than 30 calendar days after receipt of the <i>Contractor's</i> complete deficiency list and application:</p>
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		<p>.1 prepare a final deficiency list incorporating all items to be completed or corrected, including any incomplete or unsubmitted <i>Close-Out Documentation</i>. Each item shall have an indicated value for correction or completion and the determination of the total value of such items shall be determined pursuant to GC 5.8 – DEFICIENCY HOLDBACK. The final deficiency list complete with values is to be included with the <i>Consultant's</i> draft verification and shall be reviewed with the <i>Owner</i> prior to the <i>Consultant</i> rendering a determination in accordance with GC 5.4.3.2</p> <p>.2 having completed the requirements set out in GC 5.4.3.1,</p> <p>(a) the <i>Consultant</i> shall advise the <i>Contractor</i> in writing that the <i>Work</i> or the designated portion of the <i>Work</i> is not substantially performed and give reasons why, or</p> <p>(b) the <i>Consultant</i> shall state the date of <i>Substantial Performance of the Work</i> in a certificate and issue a copy of that certificate to each the <i>Owner</i> and the <i>Contractor</i>.</p> <p>5.4.4 Following the issuance of the certificate of <i>Substantial Performance of the Work</i> referenced in subparagraph 5.4.3.2(b):</p> <p>.1 The <i>Contractor</i> shall publish, in a construction trade newspaper in the area of the location of the <i>Work</i>, a copy of the certificate of <i>Substantial Performance of the Work</i> referred to in GC 5.4.2.2(b) within seven (7) calendar days of receiving a copy of the certificate signed by the <i>Consultant</i>, and the <i>Contractor</i> shall provide suitable evidence of the publication to the <i>Consultant</i> and the <i>Owner</i>. If the <i>Contractor</i> fails to publish such notice, the <i>Owner</i> shall be at liberty to publish said certificate and back-charge the <i>Contractor</i> its reasonable costs for doing so;</p> <p>.2 The <i>Contractor</i> shall complete the <i>Work</i> within forty (40) calendar days of the date certified as the date of <i>Substantial Performance of the Work</i>;</p> <p>.3 Notwithstanding any other provisions of the <i>Contract</i>, no payments will be processed between <i>Substantial Performance of the Work</i> and <i>Ready-for-Takeover</i>;</p> <p>.4 The <i>Owner</i> reserves the right to contract out any or all unfinished <i>Work</i> if it has not been completed within forty (40) days of <i>Substantial Performance of the Work</i> using, without limitation, the funds retained in accordance with GC 5.8 - DEFICIENCY HOLDBACK, without prejudice to any other right or remedy and without affecting the warranty period. The cost to the <i>Owner</i> of completing the <i>Work</i> including <i>Owner</i> and <i>Consultant</i> wages and materials shall be deducted from the <i>Contract Price</i>.</p> <p>5.4.5 After publication of the certificate of the <i>Substantial Performance of the Work</i>, and provided that the <i>Contractor</i> has completed performance of the <i>Work</i> within the 40 calendar days following certification of <i>Substantial Performance of the Work</i>, the <i>Contractor</i> may submit an application for payment of the outstanding <i>Construction Act</i> holdback amount, which application for payment shall:</p> <p>.1 include all of the requirements listed in EXHIBIT "1" - PROJECT SPECIFIC REQUIREMENTS FOR A PROPER INVOICE, as applicable to the application for payment of the holdback amount; and</p> <p>.2 include a statement that the <i>Contractor</i> has not received any written notices of lien or any claims for liens from any <i>Subcontractor</i> or <i>Supplier</i>.</p>
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		<p>5.4.6 The <i>Construction Act</i> holdback amount shall become due and payable the day immediately following the expiration of the holdback period prescribed by the <i>Construction Act</i> (in most cases being the 61st calendar day following the publication of the certificate of <i>Substantial Performance of the Work</i> referred to in GC 5.4.4.1), subject to the occurrence of any of the following:</p> <ul style="list-style-type: none"> <li>.1 the preservation of a lien in respect of the <i>Project</i> that has not been satisfied, discharged or otherwise provided for in accordance with the <i>Construction Act</i>;</li> <li>.2 receipt by the <i>Owner</i> of a written notice of lien that has not been satisfied, discharged or otherwise provided for in accordance with the <i>Construction Act</i>; or</li> <li>.3 prior to the expiry of 40 calendar days following the publication of the certificate of <i>Substantial Performance of the Work</i>, the <i>Owner</i> publishes a <i>Notice of Non-Payment</i> of holdback in accordance with the <i>Construction Act</i> (Form 6), setting out the amount of holdback that will not be paid, which may include non-payment to secure the correction of deficiencies and/or the completion of the <i>Work</i>.</li> </ul> <p>5.4.7 Notwithstanding the <i>Owner's</i> obligation to make payment of the holdback amount in accordance with GC 5.4.6, the processing of such payment remains subject to the <i>Owner's</i> internal <i>EFT</i> timing limitations. The <i>Owner</i> covenants, and the <i>Contractor</i> agrees, that payment of the holdback shall be made by <i>EFT</i> at the first opportunity during the <i>Owner's</i> normal processing of <i>EFTs</i> upon the holdback becoming due in accordance with GC 5.4.6..</p>
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**SC32 GC 5.5 FINAL PAYMENT**

SC32.1	GC 5.5	<p><u>Delete</u> GC 5.5 in its entirety, including all subparagraphs thereunder and <u>replace</u> it with the following:</p> <p>"5.5.1 When <i>Ready-for-Takeover</i> has been achieved in accordance with GC 12.1 – READY-FOR-TAKEOVER and the <i>Contractor</i> considers the <i>Work</i> is complete, and after the <i>Contractor</i>, the <i>Owner</i>, and the <i>Consultant</i> have attended a <i>Pre-Invoice Submission Meeting</i> analogous to the requirement in GC 5.2.1 (the "<b><i>Final Pre-Invoice Submission Meeting</i></b>"), the <i>Contractor</i> may submit an application for final payment to the <i>Owner</i> and to the <i>Consultant</i>, which application for payment shall:</p> <ul style="list-style-type: none"> <li>.1 include all of the requirements set out in GC 5.2.2, including without limitation those requirements listed in APPENDIX "1" - PROJECT SPECIFIC REQUIREMENTS FOR A PROPER INVOICE that are specific to an application for final payment; and</li> <li>.2 if applicable, (a) a certificate from the <i>Consultant</i> or written confirmation from the <i>Owner</i> that the deficiencies or incomplete <i>Work</i> waived by the <i>Owner</i> pursuant to GC 12.1.2 have been fully rectified as of the date of the <i>Contractor's</i> application for final payment, and/or (b) written confirmation, signed by the <i>Owner</i> and the <i>Contractor</i>, that the <i>Contract Price</i> has been reduced by a specified amount in exchange for the <i>Owner</i> releasing the <i>Contractor</i> of its obligation to rectify the certain outstanding deficiencies and/or incomplete <i>Work</i> waived by the <i>Owner</i> pursuant to GC 12.1.2, as detailed in such written confirmation.</li> </ul>
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	<p>5.5.2 No later than 5 calendar days prior to the <i>Final Pre-Invoice Submission Meeting</i>, the <i>Contractor</i> will, if not already provided, submit to the <i>Consultant</i> all <i>Close-Out Documentation</i>.</p> <p>5.5.3 Delivery of all <i>Close-Out Documentation</i> is a requirement for the <i>Proper Invoice</i> for final payment.</p> <p>5.5.4 After receipt by the <i>Owner</i> and the <i>Consultant</i> of an application for payment submitted by the <i>Contractor</i> that is a <i>Proper Invoice</i> and by no later than 10 calendar days after the receipt of the <i>Proper Invoice</i>:</p> <p style="padding-left: 40px;">.1 the <i>Consultant</i> will either:</p> <p style="padding-left: 80px;">(a) issue to the <i>Owner</i> with a copy to the <i>Contractor</i>, a progress payment certificate in the amount applied for by the <i>Contractor</i> in the <i>Proper Invoice</i>, or</p> <p style="padding-left: 80px;">(b) deliver a finding to the <i>Owner</i> with reasons why an amount other than what is claimed in the <i>Proper Invoice</i> is properly due to the <i>Contractor</i>, which finding the <i>Owner</i> may accept or amend prior to issuing a <i>Notice of Non-Payment</i> (Form 1.1), if any, in accordance with GC 5.5.2;</p> <p style="padding-left: 40px;">.2 the <i>Owner</i> shall make payment to the <i>Contractor</i> on account as provided in Article A-5 PAYMENT,</p> <p style="padding-left: 80px;">(a) in the amount stated in the certificate for payment, or</p> <p style="padding-left: 80px;">(b) in the amount stated in the certificate for payment less such amount stated in the <i>Owner's Notice of Non-Payment</i> issued pursuant to GC 5.5.5,</p> <p style="padding-left: 80px;">on the 28th calendar day after receipt of a <i>Proper Invoice</i>, unless such 28th calendar day lands on a day that is other than a <i>Working Day</i>, in which case payment shall be made on the next <i>Working Day</i> after such 28th day.</p> <p>5.5.5 In the event that the application for final payment delivered by the <i>Contractor</i> does not include the requirements of GC 5.5.1 (including the requirements for a <i>Proper Invoice</i>) and GC 5.5.2 or where the <i>Owner</i> disputes the amount claimed as payable in the <i>Proper Invoice</i>, then the <i>Owner</i> shall within 14 calendar days of receipt of the application for payment, issue a <i>Notice of Non-Payment</i>. Where the <i>Owner</i> has delivered a <i>Notice of Non-Payment</i>, as specified under this GC 5.5.5, the <i>Owner</i> and the <i>Contractor</i> shall first engage in good faith negotiations to resolve the dispute. If within 5 calendar days following the issuance of a <i>Notice of Non-Payment</i>, despite good faith efforts by both parties with the assistance of the <i>Consultant</i>, the <i>Owner</i> and the <i>Contractor</i> cannot resolve the dispute, either party may commence an <i>Adjudication</i> in accordance with the procedures set out in the <i>Construction Act</i>. Any portion of the <i>Proper Invoice</i> which is not the subject of the <i>Notice of Non-Payment</i> shall be payable within the time period set out in GC 5.5.4.2.</p> <p>5.5.6 Subject to the provisions of the <i>Construction Act</i> and any other rights conferred on the <i>Owner</i> at law or under this <i>Contract</i> to withhold payment or backcharge or set-off against payment, the <i>Owner</i> shall pay the amount payable under a <i>Proper Invoice</i> for final payment in accordance with the <i>Construction Act</i>.</p> <p>5.5.7 When the <i>Consultant</i> issues certificate of completion in accordance with GC 5.5.4.1, the <i>Consultant</i> shall also issue a certificate for release of any holdback for finishing work amount. In accordance with the <i>Construction Act</i>, the <i>Owner</i> may retain any amounts which are required by law to satisfy any liens against the <i>Work</i>, in respect of any third party claims made to the <i>Owner</i> in respect of the <i>Contract</i> or the <i>Work</i>, and in respect of any claims the <i>Owner</i> may have against the <i>Contractor</i>. Subject to</p>
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		the foregoing, the <i>Owner</i> shall release the holdback in accordance with the <i>Construction Act</i> .”
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**SC33 GC 5.6 DEFERRED WORK**

SC33.1	5.6.1	<p><u>Delete</u> paragraph 5.6.1 and <u>replace</u> with the following:</p> <p>“5.6.1 If because of conditions reasonably beyond the control of the <i>Contractor</i>, there are items of work that cannot be performed, payment in full for that portion of the <i>Work</i> which has been performed as certified by the <i>Consultant</i> shall not be withheld or delayed by the <i>Owner</i> on account thereof, but the <i>Owner</i> may withhold, subject to its requirement to issue a <i>Notice of Non-Payment</i> under the <i>Construction Act</i>, until the remaining portion of the <i>Work</i> is finished, only such an amount that the <i>Consultant</i> determines is sufficient and reasonable to cover the cost of performing such remaining work. The remaining work shall be valued as deficient work as defined in GC 5.8.1.”</p>
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**SC34 \*NEW\* GC 5.8 DEFICIENCY HOLDBACK**

SC34.1	5.8.1	<p><u>Add</u> new GC 5.8 – DEFICIENCY HOLDBACK as follows:</p> <p><b>“GC 5.8 DEFICIENCY HOLDBACK</b></p> <p>5.8.1 Notwithstanding any provisions contained in the <i>Contract Documents</i> concerning certification and release of monies to the <i>Contractor</i>, the <i>Owner</i> reserves the right to establish a deficiency holdback, at the time of the review for <i>Substantial Performance of the Work</i>, based on a 200% dollar value of the deficiencies listed by the <i>Consultant</i>.</p> <p>5.8.2 In performing the calculation under GC 5.8.1,</p> <p>.1 no individual deficiency will be valued at less than five hundred dollars (\$500.00); and</p> <p>.2 for any <i>Close-Out Documentation</i> not submitted in advance of or as part of the <i>Contractor’s</i> application for <i>Substantial Performance of the Work</i>, an amount shall be retained by the <i>Owner</i> as part of the deficiency holdback that is equal to the estimated time and material costs to retain a third-party to re-create the applicable <i>Close-Out Documentation</i>, as determined by the <i>Consultant</i>, until such time as the applicable <i>Close-Out Documentation</i> is submitted and approved.</p> <p>5.8.3 The deficiency holdback shall be due and payable to the <i>Contractor</i> on the 61<sup>st</sup> day following completion of all of the deficiencies listed by the <i>Consultant</i>, there being no claims for lien registered against the title to the <i>Place of the Work</i> issued in accordance with the <i>Construction Act</i>, and less any amounts disputed under an <i>Owner’s Notice of Non-Payment</i> (Form 1.1).”</p>
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**PART 6 CHANGES IN THE WORK**

**SC35 GC 6.1 OWNER’S RIGHT TO MAKE CHANGES**

SC35.1	6.1.2	<u>Add</u> the following to the end of GC 6.1.2:
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		<p>“This requirement is of the essence and it is the express intention of the parties that any claims by the <i>Contractor</i> for a change in the <i>Contract Price</i> and/or <i>Contract Time</i> shall be barred unless there has been strict compliance with PART 6 - CHANGES IN THE WORK. No verbal dealings between the parties and no implied acceptance of alterations or additions to the <i>Work</i> and no claims that the <i>Owner</i> has been unjustly enriched by any alteration or addition to the <i>Work</i>, whether in fact there is any such unjust enrichment or not, shall be the basis of a claim for additional payment under this <i>Contract</i>, an increase to the <i>Contract Price</i>, or a claim for any extension of the <i>Contract Time</i>.”</p>
SC35.2	6.1.3 to 6.1.8	<p><u>Add</u> new paragraphs 6.1.3, 6.1.4, 6.1.5, 6.1.6, 6.1.7 and 6.1.8 as follows:</p> <p>“6.1.3 The <i>Contractor</i> agrees that changes resulting from construction coordination, including but not limited to, site surface conditions, site coordination, and <i>Subcontractor and Supplier</i> coordination are included in the <i>Contract Price</i> and the <i>Contractor</i> shall be precluded from making any claim for a change in the <i>Contract Price</i> as a result of such changes.</p> <p>6.1.4 Labour costs shall be actual, prevailing rates at the <i>Place of the Work</i> paid to workers, plus statutory charges on labour including WSIB, unemployment insurance, Canada pension, vacation pay, hospitalization and medical insurance. The <i>Contractor</i> shall provide these rates, when requested by the <i>Consultant</i>, for review and/or agreement.</p> <p>6.1.5 Quotations for changes to the <i>Work</i> shall only include <i>Direct Costs</i> and be accompanied by itemized breakdowns together with detailed, substantiating quotations or cost vouchers from <i>Subcontractors</i> and <i>Suppliers</i>, submitted in a format acceptable to the <i>Consultant</i> and shall include any <i>Direct Costs</i> associated with extensions in <i>Contract Time</i>.</p> <p>6.1.6 When both additions and deletions covering related <i>Work</i> or substitutions are involved in a change to the <i>Work</i>, payment, including <i>Overhead</i> and profit, shall be calculated on the basis of the net difference, if any, with respect to that change in the <i>Work</i>.</p> <p>6.1.7 No extension to the <i>Contract Time</i> shall be granted for changes in the <i>Work</i> unless the <i>Contractor</i> can clearly demonstrate that such changes significantly alter the overall construction schedule submitted at the commencement of the <i>Work</i>. Extensions of <i>Contract Time</i> and all associated costs, if approved, shall be included in the relevant <i>Change Order</i>.</p> <p>6.1.8 When a change in the <i>Work</i> is proposed or required, the <i>Contractor</i> shall within 10 calendar days submit to the <i>Consultant</i> for review a claim for a change in <i>Contract Price</i> and/or <i>Contract Time</i>. Should 10 calendar days be insufficient to prepare the submission, the <i>Contractor</i> shall within 5 calendar days, advise the <i>Consultant</i> in writing of the proposed date of submission of the claim. Claims submitted after the dates prescribed herein will not be considered.”</p>

**SC36 GC 6.2 CHANGE ORDER**

SC36.1	6.2.1	<p>In paragraph 6.2.1 after the last sentence in the paragraph <u>add</u> the following:</p> <p>“The adjustment in the <i>Contract Time</i> and the <i>Contract Price</i> shall include an adjustment, if any, for delay or for the impact that the change in the <i>Work</i> has on the <i>Work</i> of the <i>Contractor</i>, and once such adjustment is made, the <i>Contractor</i> shall be precluded from making any further claims for delay or impact with respect to the change in the <i>Work</i>.”</p>
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SC36.2	6.2.3 to 6.2.5	<p><u>Add</u> new paragraphs 6.2.3, 6.2.4, and 6.2.5 as follows:</p> <p>“6.2.3 The value of a change shall be determined in one or more of the following methods as directed by the <i>Consultant</i>:</p> <p>.1 by estimate and acceptance of a lump sum;</p> <p>.2 by negotiated unit prices which include the <i>Contractor’s</i> overhead and profit, or;</p> <p>.3 by the actual <i>Direct Cost</i> to the <i>Owner</i>, such costs to be the actual cost after all credits included in the change have been deducted, plus the following ranges of mark-up on such costs:</p> <p>.1 for <i>Change Orders</i> with a value of \$0 to \$15,000 the total <i>Subcontractor/Supplier</i> mark-up including <i>Overhead</i> and profit shall be 10% and the total <i>Contractor</i> mark-up including overhead and profit shall be 5%.</p> <p>.2 for <i>Change Orders</i> in excess of \$15,000, the total <i>Subcontractor/Supplier</i> mark-up including <i>Overhead</i> and profit shall be 5% and the total <i>Contractor</i> mark-up including <i>Overhead</i> and profit shall be 3%.</p> <p>6.2.4 All quotations shall include <i>Direct Costs</i> and be submitted in a complete manner listing:</p> <p>.1 quantity of each material,</p> <p>.2 unit cost of each material,</p> <p>.3 man hours involved,</p> <p>.4 cost per hour,</p> <p>.5 <i>Subcontractor</i> quotations submitted listing items 1 to 4 above and item 6 below.</p> <p>.6 mark-up.</p> <p>6.2.5 The <i>Owner</i> and the <i>Consultant</i> will not be responsible for delays to the <i>Work</i> resulting from late, incomplete or inadequately broken-down valuations submitted by the <i>Contractor</i>.”</p>
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**SC37 GC 6.3 CHANGE DIRECTIVE**

SC37.1	6.3.6.1	<p><u>Amend</u> paragraph 6.3.6.1 by deleting the final period and adding the following:</p> <p>“.1 Ten percent (10%) for profit plus five percent (5%) for overhead on work by the <i>Contractor’s</i> own forces up to the value of \$15,000 and five percent (5%) for profit plus three percent (3%) for <i>Overhead</i> on work by the <i>Contractor’s</i> own forces in excess of \$15,000 and,</p> <p>.2 Ten percent (10%) fee on amounts paid to <i>Subcontractors</i> or <i>Suppliers</i> under subparagraph 6.3.7.9 for changes up to the value of \$15,000 and five percent (5%) on changes over \$15,000.</p> <p>Unless a <i>Subcontractor’s</i> or <i>Supplier’s</i> price has been approved by the <i>Owner</i>, the <i>Subcontractor</i> or <i>Supplier</i> shall be entitled to its actual net cost as determined in accordance with paragraph 6.3.7, plus ten percent (10%) for profit and five percent (5%) for <i>Overhead</i> on such actual net cost for changes in the <i>Work</i>, up to the value of \$15,000 and five percent</p>
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		(5%) for profit and three percent (3%) for overhead on such actual net cost changes in the <i>Work</i> in excess of \$15,000.”
SC37.2	6.3.6.2	<u>Delete</u> paragraph 6.3.6.2 and <u>replace</u> it with the following:  “.2 If a change in the <i>Work</i> results in a net decrease in the <i>Contract Price</i> , the amount of the credit shall be the net cost, without deduction for <i>Overhead</i> or profit.”
SC37.3	6.3.7.1(4)	<u>Delete</u> GC 6.3.7.1(4).
SC37.4	6.3.7.7	Amend GC 6.3.7.7 by <u>deleting</u> the words “described in paragraph 6.3.7.1” and <u>replacing</u> them with “approved by the <i>Owner</i> in writing and in advance of any such expenses being incurred;”
SC37.5	6.3.7.9	Amend GC 6.3.7.9 by <u>adding</u> the following to the end of the paragraph: “...when specifically requested by the <i>Owner</i> or as directed by the <i>Consultant</i> .”
SC37.6	6.3.7.10	Amend GC 6.3.7.10 by <u>adding</u> the following to the end of the paragraph: “, provided that such amounts are not caused by negligent acts, omissions, or default of the <i>Contractor</i> or <i>Subcontractor</i> .”
SC37.7	6.3.7.13	<u>Delete</u> GC 6.3.7.13.
SC37.8	6.3.7.15	<u>Delete</u> GC 6.3.7.15.
SC37.9	6.3.7.17	<u>Delete</u> GC 6.3.7.17 in its entirety including all subparagraphs.
SC37.10	6.3.11	<u>Delete</u> GC 6.3.11 and <u>replace</u> it with the following:  “6.3.11 The value of the <i>Work</i> performed as a result of a <i>Change Directive</i> shall not be eligible to be included in progress payments until the amount, including the method for determining the amount, of such <i>Change Directive</i> has been determined.”

**SC38 GC 6.4 CONCEALED OR UNKNOWN CONDITIONS**

SC38.1	6.4.1	<u>Delete</u> paragraph 6.4.1 in its entirety and <u>replace</u> with the following:  “6.4.1.1 Prior to the submission of the bid on which the Contract was awarded, the Contractor confirms that it carefully investigated the Place of the Work insofar as the Place of Work was available for investigation and, in doing so, applied to that investigation the degree of care and skill required by paragraph 3.14.1  6.4.1.2 No claim by the <i>Contractor</i> will be considered by the <i>Owner</i> or the <i>Consultant</i> in connection with conditions which could reasonably have been ascertained by such investigation or other due diligence undertaken prior to the execution of the <i>Contract</i> .”
SC38.2	6.4.2	<u>Amend</u> paragraph 6.4.2 by <u>adding</u> a new first sentence as follows:  “Having regard to paragraph 6.4.1, if the <i>Contractor</i> believes that the conditions of the <i>Place of the Work</i> differ materially from those reasonably anticipated, differ materially from those indicated in the <i>Contract Documents</i> or were concealed from discovery notwithstanding the conduct of the investigation described in paragraph 6.4.1, it shall provide the <i>Owner</i> and the <i>Consultant</i> with <i>Notice in Writing</i> no later than five (5) <i>Working Days</i> after the first observation of such conditions.”  -and-



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		<u>amend</u> the existing second sentence of paragraph 6.4.2 in the second line, following the word “materially” by <u>adding</u> the words “or were concealed from discovery notwithstanding the conduct of the investigation described in paragraph 6.4.1.”.
SC38.3	6.4.3	<u>Delete</u> paragraph 6.4.3 in its entirety and <u>substitute</u> the following:  “6.4.3 If the <i>Consultant</i> makes a finding pursuant to paragraph 6.4.2 that no change in the <i>Contract Price</i> or the <i>Contract Time</i> is justified, the <i>Consultant</i> shall report in writing the reasons for this finding to the <i>Owner</i> and the <i>Contractor</i> .”
SC38.4	6.4.5	<u>Add</u> new paragraph 6.4.5 as follows:  “6.4.5 No claims for additional compensation or for an extension of <i>Contract Time</i> shall be allowed if the <i>Contractor</i> fails to give <i>Notice in Writing</i> to the <i>Owner</i> or <i>Consultant</i> , as required by paragraph 6.4.2.”

**SC39 GC 6.5 DELAYS**

SC39.1	6.5.1	In paragraph 6.5.1 <u>delete</u> the words after the word “for” in the fourth line and <u>replace</u> them with the words “...reasonable <i>Direct Costs</i> directly flowing from the delay, but excluding any consequential, indirect or special damages (including, without limitation, loss of profits, loss of opportunity or loss of productivity).”
SC39.2	6.5.2	<u>Delete</u> GC 6.5.2 in its entirety and <u>replace</u> it with the following:  “6.5.2 If the <i>Contractor</i> is delayed in the performance of the <i>Work</i> by a stop work order issued by a court or other public authority and providing that such order was issued on account of a direct breach, violation, contravention, or a failure to abide by any laws, ordinances, rules, regulations, or codes by the <i>Owner</i> , <i>Other Contractor(s)</i> , or the <i>Consultant</i> , and relating to the <i>Work</i> or the <i>Place of the Work</i> , then the <i>Contract Time</i> shall be extended for such reasonable time as the <i>Consultant</i> may determine. The <i>Contractor</i> shall be reimbursed by the <i>Owner</i> for reasonable <i>Direct Costs</i> directly flowing from the delay, but excluding any consequential, indirect or special damages (including, without limitation, loss of profits, loss of opportunity or loss of productivity).”
SC39.3	6.5.3	<u>Delete</u> paragraph 6.5.3 in its entirety and <u>replace</u> with the following:  “6.5.3 If either party is delayed in the performance of their obligations under this <i>Contract</i> by <i>Force Majeure</i> , then the <i>Contract Time</i> shall be extended for such reasonable time as the <i>Owner</i> and the <i>Contractor</i> shall agree. The extension of time shall not be less than the time lost as a result of the event causing the delay, unless the parties agree to a shorter extension. Neither party shall be entitled to payment for costs incurred by such delays. Upon reaching agreement on the extension of the <i>Contract Time</i> attributable to the <i>Force Majeure</i> event, the <i>Owner</i> and the <i>Contractor</i> shall execute a <i>Change Order</i> indicating the length of the extension to the <i>Contract Time</i> and confirming that there are no costs payable by the either party for the extension of <i>Contract Time</i> . However, if at the time an event of <i>Force Majeure</i> arises a party is in default of its obligations under the <i>Contract</i> and has received a notice of default pursuant to PART 7 – DEFAULT NOTICE, this paragraph 6.5.3 shall not excuse a party from its obligation to cure the default(s). For greater certainty, the defaulting party, to the extent possible, must continue to address and cure the default notwithstanding an event of <i>Force Majeure</i> .”
SC39.4	6.5.4	<u>Delete</u> paragraph 6.5.4 in its entirety and <u>replace</u> it with the following:



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		<p>“6.5.4 No extension or compensation shall be made for delay or impact on the <i>Work</i> unless notice in writing of a claim is given to the <i>Consultant</i> not later than ten (10) <i>Working Days</i> after the commencement of the delays or impact on the <i>Work</i>, provided however, that, in the case of a continuing cause of delay or impact on the <i>Work</i>, only one notice of claim shall be necessary.”</p>
SC39.5	6.5.6 to 6.5.8	<p><u>Add</u> new paragraphs 6.5.6, 6.5.7 and 6.5.8 as follows:</p> <p>“6.5.6 If the <i>Contractor</i> is delayed in the performance of the <i>Work</i> by an act or omission of the <i>Contractor</i> or anyone directly or indirectly employed or engaged by the <i>Contractor</i>, or by any cause within the <i>Contractor’s</i> control, then (i) firstly, at its expense, and to the extent possible, the <i>Contractor</i> shall accelerate the work and/or provide overtime work to recover time lost by a delay arising under this paragraph 6.5.6, and (ii) secondly, where it is not possible for the <i>Contractor</i> to recover the time lost by implementing acceleration measures and/or overtime work, the <i>Contract Time</i> may be extended for such reasonable time as the <i>Owner</i> may decide in consultation with the <i>Consultant</i> and the <i>Contractor</i>. The <i>Owner</i> shall be reimbursed by the <i>Contractor</i> for all reasonable costs incurred by the <i>Owner</i> as the result of such delay, including, but not limited to, <i>Owner’s</i> staff costs, the cost of all additional services required by the <i>Owner</i> from the <i>Consultant</i> or any sub-consultants, project managers, or others employed or engaged by the <i>Owner</i>, and in particular, the costs of the <i>Consultant’s</i> services during the period between the date of <i>Substantial Performance of the Work</i> stated in Article A-1 herein, as the same may be extended through the provision of these General Conditions, and any later or actual date of <i>Substantial Performance of the Work</i> achieved by the <i>Contractor</i>.</p> <p>6.5.7 Without limiting the obligations of the <i>Contractor</i> described in GC 3.2 – CONSTRUCTION BY OWNER OR OTHER CONTRACTORS or GC 9.4 – CONSTRUCTION SAFETY, the <i>Owner</i> or <i>Consultant</i> may, by <i>Notice in Writing</i>, direct the <i>Contractor</i> to stop the <i>Work</i> where the <i>Owner</i> or <i>Consultant</i> determines that there is an imminent risk to the safety of persons or property at the <i>Place of the Work</i>. In the event that the <i>Contractor</i> receives such notice, it shall immediately stop the <i>Work</i> and secure the site. The <i>Contractor</i> shall not be entitled to an extension of the <i>Contract Time</i> or to an increase in the <i>Contract Price</i> unless the resulting delay, if any, would entitle the <i>Contractor</i> to an extension of the <i>Contact Time</i> or the reimbursement of the <i>Contractor’s</i> costs as provided in paragraphs 6.5.1, 6.5.2 or 6.5.3.</p> <p>6.5.8 No claim for delay shall be made by the <i>Contractor</i> and the <i>Contract Time</i> shall not be extended due to climatic conditions or arising from the <i>Contractor’s</i> efforts to maintain the <i>Construction Schedule</i>.”</p>

**PART 7 DEFAULT NOTICE**

**SC40 GC 7.1 OWNER’S RIGHT TO PERFORM THE WORK, TERMINATE THE CONTRACTOR’S RIGHT TO CONTINUE WITH THE WORK OR TERMINATE THE CONTRACT**

SC40.1	7.1.2	In GC 7.1.2, delete the words “and if the <i>Consultant</i> has given a written statement to the <i>Owner</i> and <i>Contractor</i> which provides the detail of such neglect to perform the <i>Work</i> properly or such failure to comply with the requirements of the <i>Contract</i> to a substantial degree”.
SC40.2	7.1.3.4	<p><u>Add</u> a new subparagraph 7.1.3.4 as follows:</p> <p>“.4 an “acceptable schedule” as referred to in subparagraph 7.1.3.2. means a schedule approved by the <i>Consultant</i> and the <i>Owner</i> wherein the default can be corrected within the balance of the <i>Contract Time</i> and shall not cause delay to any other aspect of the</p>



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		<i>Work</i> or the work of other contractors, and in no event shall it be deemed to give a right to extend the <i>Contract Time</i> .”
SC40.3	7.1.4.1	<u>Delete</u> subparagraph 7.1.4.1 and <u>replace</u> it with the following:  “.1 correct such default and deduct the cost, including <i>Owner’s</i> expenses, thereof from any payment then or thereafter due the <i>Contractor</i> .”
SC40.4	7.1.4.2	<u>Delete</u> subparagraph 7.1.4.2 and <u>replace</u> it with the following:  “.2 by providing <i>Notice in Writing</i> to the <i>Contractor</i> , terminate the <i>Contractor’s</i> right to continue with the <i>Work</i> in whole or in part or terminate the <i>Contract</i> , and publish a notice of termination (Form 8) in accordance with the <i>Act</i> .”
SC40.5	7.1.5.3	In subparagraph 7.1.5.3 <u>delete</u> the words: “however, if such cost of finishing the <i>Work</i> is less than the unpaid balance of the <i>Contract Price</i> , the <i>Owner</i> shall pay the <i>Contractor</i> the difference”
SC40.6	7.1.6 to 7.1.10	<u>Delete</u> GC 7.1.6 and <u>replace</u> it with new paragraphs 7.1.6, 7.1.7, 7.1.8, 7.1.9 and 7.1.10 as follows:  “7.1.6 In addition to its right to terminate the <i>Contract</i> set out herein, the <i>Owner</i> may terminate this <i>Contract</i> at any time for any other reason and without cause upon giving the <i>Contractor</i> fifteen (15) <i>Working Days Notice in Writing</i> to that effect. In such event, the <i>Contractor</i> shall be entitled to be paid for all <i>Work</i> performed including reasonable profit, for loss sustained upon <i>Products</i> and <i>Construction Equipment</i> , and such other damages as the <i>Contractor</i> may have sustained as a result of the termination of the <i>Contract</i> , but in no event shall the <i>Contractor</i> be entitled to be compensated for any loss of profit on unperformed portions of the <i>Work</i> , or indirect, special, or consequential damages incurred.  7.1.7 The <i>Owner</i> may suspend <i>Work</i> under this <i>Contract</i> at any time for any reason and without cause upon giving the <i>Contractor Notice in Writing</i> to that effect. In such event, the <i>Contractor</i> shall be entitled to be paid for all <i>Work</i> performed to the date of suspension and be compensated for all actual costs incurred arising from the suspension, including reasonable profit, for loss sustained upon <i>Products</i> and <i>Construction Equipment</i> , and such other damages as the <i>Contractor</i> may have sustained as a result of the suspension of the <i>Work</i> , but in no event shall the <i>Contractor</i> be entitled to be compensated for any indirect, special, or consequential damages incurred. In the event that the suspension continues for more than thirty (30) calendar days, the <i>Contract</i> shall be deemed to be terminated and the provisions of paragraph 7.1.6 shall apply.  7.1.8 In the case of either a termination of the <i>Contract</i> or a suspension of the <i>Work</i> under GC 7.1 - OWNER’S RIGHT TO PERFORM THE WORK, TERMINATE THE CONTRACTOR’S RIGHT TO CONTINUE WITH THE WORK, OR TERMINATE THE CONTRACT or GC 7.2 - CONTRACTOR’S RIGHT TO SUSPEND THE WORK OR TERMINATE THE CONTRACT, the <i>Contractor</i> shall use its best commercial efforts to mitigate the financial consequences to the <i>Owner</i> arising out of the termination or suspension, as the case may be.  7.1.9 Upon the resumption of the <i>Work</i> following a suspension under GC 7.1 - OWNER’S RIGHT TO PERFORM THE WORK, TERMINATE THE CONTRACTOR’S RIGHT TO CONTINUE WITH THE WORK, OR TERMINATE THE CONTRACT or GC 7.2 - CONTRACTOR’S RIGHT TO SUSPEND THE WORK OR TERMINATE THE CONTRACT, the <i>Contractor</i> will endeavour to minimize the delay and financial consequences arising out of the suspension.  7.1.10 The <i>Contractor’s</i> obligations under the <i>Contract</i> as to quality, correction, and warranty of the <i>Work</i> performed by the <i>Contractor</i> up to the time of termination or



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		suspension shall continue after such termination of the <i>Contract</i> or suspension of the <i>Work</i> .”
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**SC41 GC 7.2 CONTRACTOR’S RIGHT TO SUSPEND THE WORK OR TERMINATE THE CONTRACT**

SC41.1	7.2.2	<p><u>Delete</u> paragraph 7.2.2 and <u>replace</u> it with the following:</p> <p>“7.2.2 If the <i>Work</i> is suspended or otherwise delayed for a period of 40 consecutive <i>Working Days</i> or more under a stop work order issued by a court or other public authority on account of a breach, violation, contravention, or a failure to abide by any laws, ordinances, rules, regulations, or codes directly by the <i>Owner</i>, the <i>Owner’s</i> other contractor(s), or the <i>Consultant</i>, and relating to the <i>Work</i> or the <i>Place of the Work</i>, the <i>Contractor</i> may, without prejudice to any other right or remedy the <i>Contractor</i> may have, terminate the <i>Contract</i> by giving the <i>Owner</i> Notice in <i>Writing</i> to that effect.”</p>
SC41.2	7.2.3.1	<u>Delete</u> subparagraph 7.2.3.1 in its entirety.
SC41.3	7.2.3.2	<u>Delete</u> subparagraph 7.2.3.2 in its entirety.
SC41.4	7.2.3.4	In subparagraph 7.2.3.4, <u>delete</u> the words "except for GC 5.1 - FINANCING INFORMATION REQUIRED OF THE OWNER".
SC41.5	7.2.5	<p><u>Delete</u> paragraph 7.2.5 and <u>replace</u> it with the following:</p> <p>“7.2.5 If the default cannot be corrected within the 5 <i>Working Days</i> specified in paragraph 7.2.4, the <i>Owner</i> shall be deemed to have cured the default if it:</p> <ul style="list-style-type: none"> <li>.1 commences correction of the default within the specified time;</li> <li>.2 provides the <i>Contractor</i> with an acceptable schedule for such correction; and,</li> <li>.3 completes the correction in accordance with such schedule.”</li> </ul>
SC41.6	7.2.6 to 7.2.9	<p><u>Add</u> new paragraphs 7.2.6, 7.2.7, 7.2.8 and 7.2.9 as follows:</p> <p>“7.2.6 If the <i>Contractor</i> terminates the <i>Contract</i> under the conditions described in GC 7.2 – CONTRACTOR’S RIGHT TO SUSPEND THE WORK OR TERMINATE THE CONTRACT, the <i>Contractor</i> shall be entitled to be paid for all <i>Work</i> performed to the date of termination, as determined by the <i>Consultant</i>. The <i>Contractor</i> shall also be entitled to recover the direct costs associated with termination, including the costs of demobilization and losses sustained on <i>Products</i> and <i>Construction Equipment</i>. The <i>Contractor</i> shall not be entitled to any recovery for any special, indirect or consequential losses, including loss of profit.</p> <p>7.2.7 The <i>Contractor</i> shall not be entitled to give notice of the <i>Owner’s</i> default or terminate the <i>Contract</i> in the event the <i>Owner</i> withholds certificates or payment or both in accordance with the <i>Contract</i> because of:</p> <ul style="list-style-type: none"> <li>.1 the <i>Contractor’s</i> failure to pay all legitimate claims promptly, or</li> <li>.2 the failure of the <i>Contractor</i> to discharge construction liens which are registered against the title to the <i>Place of the Work</i>.</li> </ul> <p>7.2.8 The <i>Contractor’s</i> obligations under the <i>Contract</i> as to quality, correction and warranty of the <i>Work</i> performed by the <i>Contractor</i> up to the effective date of</p>



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		<p>termination shall continue in force and shall survive termination of this <i>Contract</i> by the <i>Contractor</i>.</p> <p>7.2.9 If the <i>Contractor</i> suspends the <i>Work</i> or terminates the <i>Contract</i> as provided for in GC 7.2 – CONTRACTOR’S RIGHT TO SUSPEND THE WORK OR TERMINATE THE CONTRACT, the <i>Contractor</i> shall ensure the site and the <i>Work</i> are left in a safe, secure condition as required by authorities having jurisdiction at the <i>Place of the Work</i> and the <i>Contract Documents</i>.”</p>
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**PART 8 DISPUTE RESOLUTION**

**SC42 GC 8.1 AUTHORITY OF THE CONSULTANT**

SC42.1	8.1.3	<p><u>Delete</u> paragraph 8.1.3 in its entirety and <u>substitute</u> as follows:</p> <p>“8.1.3 If a dispute is not resolved promptly, the <i>Consultant</i> will give such instruction as in the <i>Consultant’s</i> opinion are necessary for the proper performance of the <i>Work</i> and to prevent delays pending settlement of the dispute. The parties shall act immediately according to such instructions, it being understood that by doing so neither party will jeopardize any claim the party may have.”</p>
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**SC43 GC 8.2 ADJUDICATION**

SC43.13	8.2.2 to 8.2.7	<p><u>Add</u> new GC 8.2.2, 8.2.3, 8.2.4, 8.2.5, 8.2.6, and 8.2.7 as follows:</p> <p>“8.2.2 Save and except where the <i>Contractor</i> has given an undertaking, in accordance with the <i>Act</i>, to refer a dispute to <i>Adjudication</i>, prior to delivering a notice of <i>Adjudication</i> in a form prescribed by the <i>Act</i>, the parties agree to first address all disputes with at least one in-person meeting with the <i>Owner’s</i> representative, the <i>Consultant’s</i> representative, and the <i>Contractor’s</i> representative. The parties agree that such steps will be taken to resolve any disputes in a timely and cost-effective manner.</p> <p>8.2.3 Notwithstanding any other provisions in PART 8 DISPUTE RESOLUTION, the parties shall engage in <i>Adjudication</i> proceedings as required by, and in accordance with, the <i>Construction Act</i>.</p> <p>8.2.4 The following procedures shall apply to any <i>Adjudication</i> the parties engage in under the <i>Construction Act</i>.</p> <p>.1 any hearings shall be held at a venue within the jurisdiction of the <i>Place of the Work</i> or such other venue as the parties may agree and which is acceptable to the adjudicator;</p> <p>.2 the <i>Adjudication</i> shall be conducted in English;</p> <p>.3 each party may be represented by counsel throughout an <i>Adjudication</i>;</p> <p>.4 there shall not be any oral communications with respect to issues in dispute that are the subject of an <i>Adjudication</i> between a party and the adjudicator unless it is made in the presence of both parties or their legal representatives; and</p> <p>.5 a copy of all written communications between the adjudicator and a party shall be given to the other party at the same time.</p>
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		<p>8.2.5 Any documents or information disclosed by the parties during an <i>Adjudication</i> are confidential and the parties shall not use such documents or information for any purpose other than the <i>Adjudication</i> in which they are disclosed and shall not disclose such documents and information to any third party, unless otherwise required by law, save and except the for the adjudicator.</p> <p>8.2.6 If the <i>Contractor</i> fails to comply with any of the notice requirements set out in the <i>Contract</i>, including the time limits set out in any of the following:</p> <ul style="list-style-type: none"> <li>.1 GC 6.4 – CONCEALED OR UNKNOWN CONDITIONS;</li> <li>.2 GC 6.5 – DELAYS;</li> <li>.3 GC 6.6 – CLAIMS FOR A CHANGE IN CONTRACT PRICE;</li> <li>.4 PART 8 DISPUTE RESOLUTION</li> <li>.5 GC 9.2 – TOXIC AND HAZARDOUS SUBSTANCES</li> <li>.6 GC 9.3 – ARTIFACTS AND FOSSILS; or</li> <li>.7 GC 9.5 - MOULD</li> </ul> <p>in respect of any claim or dispute, the <i>Contractor</i> shall have no entitlement whatsoever (including to an increase in the <i>Contract Price</i>, or an extension of <i>Contract Time</i>) in the context of an <i>Adjudication</i> under the <i>Construction Act</i> and waives the right to make any such claims or disputes in an <i>Adjudication</i>. This GC 8.2.6 shall operate conclusively as an estoppel and bar in the event such claims or disputes are brought in an <i>Adjudication</i> and the <i>Owner</i> may rely on this GC 8.2.6 as a complete defence to any such claims or disputes.</p> <p>8.2.7 The parties hereby acknowledge and agree,</p> <ul style="list-style-type: none"> <li>.1 that counterclaims, claims of set-off or the exercise or use of other contractual rights that permit the <i>Owner</i> to withhold, deduct or retain from monies otherwise owed to the <i>Contractor</i> under the <i>Contract</i> may be referred to, and included as part of, <i>Adjudications</i> under the <i>Construction Act</i>;</li> <li>.2 that disputes related to the termination or abandonment of the <i>Contract</i>, as well as any disputes that arise or are advanced following the termination or abandonment of the <i>Contract</i>, shall not be referred to <i>Adjudication</i> under the <i>Construction Act</i>;</li> <li>.3 that notice(s) of <i>Adjudication</i>, with respect to any dispute or claim relating to the <i>Project</i>, shall not be given, and no <i>Adjudication</i> shall be commenced following <i>Contract</i> completion, <i>Contract</i> abandonment, or termination of the <i>Contract</i>;</li> <li>.4 that any <i>Adjudication</i> between the <i>Contractor</i> and a <i>Subcontractor</i> or a supplier that relates to an <i>Adjudication</i> between the <i>Owner</i> and the <i>Contractor</i> shall be joined together to be adjudicated by a single adjudicator, provided that the adjudicator agrees to do so, and the <i>Contractor</i> shall include a provision in each of its contracts that contain an equivalent obligation to this GC 8.2.7.4; and</li> <li>.5 that, other than where the <i>Contractor</i> is obliged to commence an <i>Adjudication</i> pursuant to an undertaking under the <i>Construction Act</i>, neither the <i>Owner</i> nor the <i>Contractor</i> shall commence an <i>Adjudication</i> during the <i>Restricted Period</i>.</li> </ul> <p>8.2.8 The parties acknowledge and agree that no <i>Adjudication</i>, arbitration, action, suit or other proceeding may be brought by the <i>Contractor</i> against the <i>Owner</i> in respect of a claim for an increase to the <i>Contract Price</i> as set out in GC 6.6, before the <i>Consultant</i> has issued its findings in respect of same, pursuant to GC 6.6.5. For greater clarity and without limiting the foregoing, the amount applied for in each <i>Proper Invoice</i> shall not include any amounts pertaining to the <i>Contractor's</i> claim for an increase in <i>Contract Price</i> unless and until the <i>Consultant</i> has issued a written notice to the <i>Contractor</i> regarding the validity of such claim, as provided for in GC 6.6.5. However, nothing in this GC 8.2.8 shall prevent a <i>Contractor</i> from commencing an <i>Adjudication</i> where, pursuant to the <i>Construction Act</i>, the <i>Contractor</i> is required</p>
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		to give an undertaking to a <i>Subcontractor</i> to commence an <i>Adjudication</i> following delivery of a <i>Notice of Non-Payment</i> .”
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**SC44 GC 8.3 NEGOTIATION, MEDIATION AND ARBITRATION**

SC44.1	8.3.1	Amend paragraph 8.3.1 by changing part of the second line from “shall appoint a <i>Project Mediator</i> ” to “may appoint a <i>Project Mediator</i> , except that such an appointment shall only be made if both the <i>Owner</i> and the <i>Contractor</i> agree.”
SC44.2	8.3.4	Amend paragraph 8.3.4 by changing part of the second line from “the parties shall request the <i>Project Mediator</i> ” to “and subject to paragraph 8.3.1 the parties may request the <i>Project Mediator</i> ”.
SC44.3	8.3.6 to 8.3.9	<p>Delete paragraphs 8.3.6, 8.3.7 and 8.3.8 in their entirety and <u>replace</u> them with the following new GCs 8.3.6, 8.3.7, 8.3.8, and 8.3.9:</p> <p>“8.3.6 The dispute may be finally resolved by arbitration under the Rules for Arbitration of Construction Disputes as provided in CCDC 40 in effect at the time of bid closing, provided that both the <i>Contractor</i> and the <i>Owner</i> agree. If the <i>Contractor</i> and the <i>Owner</i> agree to resolve the dispute by arbitration, the arbitration shall be conducted in the jurisdiction of the <i>Place of the Work</i>.</p> <p>8.3.7 Prior to delivering a notice of <i>Adjudication</i> in a form prescribed by the <i>Act</i>, the parties agree to first address all disputes by attending at least one meeting with the <i>Owner’s</i> representative, the <i>Consultant’s</i> representative, and the <i>Contractor’s</i> representative, prior to commencing an <i>Adjudication</i>. The parties agree that such steps will be taken to resolve any disputes in a timely and cost effective manner. If a resolution to the dispute(s) is not made at such a meeting, any party who plans to commence an <i>Adjudication</i> shall provide the other party with 5 <i>Working Days’ Notice in Writing</i> of its intention to issue a notice of <i>Adjudication</i>.</p> <p>8.3.8 Other than where the <i>Contractor</i> is obliged to commence an <i>Adjudication</i> pursuant to an undertaking under the <i>Construction Act</i>, neither the <i>Owner</i> nor the <i>Contractor</i> shall commence an <i>Adjudication</i> during the <i>Restricted Period</i>.</p> <p>8.3.9 Where either party has delivered a notice of <i>Adjudication</i> in a form prescribed by the <i>Act</i>, the procedures and rules set out under the <i>Construction Act</i> and the regulations thereto shall govern the <i>Adjudication</i>.”</p>

**PART 9 PROTECTION OF PERSONS AND PROPERTY**

**SC45 GC 9.1 PROTECTION OF WORK AND PROPERTY**

SC45.1	9.1.1.1	<p>Delete subparagraph 9.1.1.1 in its entirety and <u>substitute</u> the following:</p> <p>“.1 errors in the <i>Contract Documents</i> which the <i>Contractor</i> could not have discovered applying the standard of care described in paragraph 3.14.1;”</p>
SC45.2	9.1.2	<p>Delete paragraph 9.1.2 in its entirety and <u>substitute</u> as follows:</p> <p>“9.1.2 Before commencing any <i>Work</i>, the <i>Contractor</i> shall determine the locations of all underground or hidden utilities and structures indicated in or inferable from the <i>Contract Documents</i>, or that are inferable from an inspection of the <i>Place of the Work</i> exercising the degree of care and skill described in paragraph 3.14.1.”</p>
SC45.3	9.1.5	Add new paragraph 9.1.5 as follows:



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		<p>“9.1.5 With respect to any damage to which paragraphs 9.1.3 or 9.1.4 apply, the <i>Contractor</i> shall neither undertake to repair or replace any damage whatsoever to the work of other contractors, or to adjoining property, nor acknowledge that the same was caused or occasioned by the <i>Contractor</i>, without first consulting the <i>Owner</i> and receiving written instructions as to the course of action to be followed from either the <i>Owner</i> or the <i>Consultant</i>. Where, however, there is danger to life, the environment, or public safety, the <i>Contractor</i> shall take such emergency action as it deems necessary to remove the danger.”</p>
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**SC46 GC 9.2 TOXIC AND HAZARDOUS SUBSTANCES**

SC46.1	9.2.1	<p>Amend GC 9.2.1 by <u>inserting</u> the following to the end of the paragraph:</p> <p>“For the purposes of GC 9.2 – TOXIC AND HAZARDOUS SUBSTANCES, <i>Excess Soil</i> shall not be considered a ‘toxic and hazardous substance’.”</p>
SC46.2	9.2.5.5	<p>Add a new subparagraph 9.2.5.5 as follows:</p> <p>“.5 in addition to the steps described in subparagraph 9.2.5.3, take any further steps it deems necessary to mitigate or stabilize any conditions resulting from encountering toxic or hazardous substances or materials.”</p>
SC46.3	9.2.6	<p><u>Amend</u> GC 9.2.6 by <u>adding</u> the following words after the word “responsible” in the second line:</p> <p>“or whether any toxic or hazardous substances or materials already at the <i>Place of the Work</i> (and which were then harmless or stored, contained or otherwise dealt with in accordance with legal and regulatory requirements) were dealt with by the <i>Contractor</i> or anyone for whom the <i>Contractor</i> is responsible in a manner which does not comply with legal and regulatory requirements, or which threatens human health and safety or the environment, or material damages to the property of the <i>Owner</i> or others,”.</p>
SC46.4	9.2.8	<p><u>Amend</u> GC 9.2.8 by <u>adding</u> the following words after the word “responsible” in the second line:</p> <p>“or whether any toxic or hazardous substances or materials already at the <i>Place of the Work</i> (and which were then harmless or stored, contained or otherwise dealt with in accordance with legal and regulatory requirements) were dealt with by the <i>Contractor</i> or anyone for whom the <i>Contractor</i> is responsible in a manner which does not comply with legal and regulatory requirements, or which threatens human health and safety or the environment, or material damages to the property of the <i>Owner</i> or others,”.</p>
SC46.5	9.2.10	<p><u>Add</u> new paragraph 9.2.10 as follows:</p> <p>“9.2.10 The <i>Contractor</i>, <i>Subcontractors</i> and <i>Suppliers</i> shall not bring on to the <i>Place of the Work</i> any toxic or hazardous substances and materials except as required in order to perform the <i>Work</i>. If such toxic or hazardous substances or materials are required, storage in quantities sufficient to allow work to proceed to the end of any current work week only shall be permitted. All such toxic and hazardous materials and substances shall be handled and disposed of only in accordance with all laws and regulations that are applicable at the <i>Place of the Work</i>.”</p>

**SC47 GC 9.4 CONSTRUCTION SAFETY**

SC47.1	9.4.1	<p><u>Delete</u> GC 9.4.1 in its entirety and <u>replace</u> it with the following:</p>
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		<p>"9.4.1 The <i>Contractor</i> shall be solely responsible for construction safety at the <i>Place of the Work</i> and for compliance with the rules, regulations, and practices required by the <i>OHSA</i>, including, but not limited to those of the "constructor", and shall be responsible for initiating, maintaining and supervising all safety precautions and programs in connection with the performance of the <i>Work</i>. The <i>Contractor's</i> health and safety program documentation shall be made available for review by the <i>Owner</i> or <i>Consultant</i> immediately upon request. Without limiting the foregoing, the <i>Contractor</i> shall be solely responsible for construction safety in respect of the <i>Consultant, Subcontractors</i> and <i>Suppliers</i>, the <i>Owner's</i> own forces, <i>Other Contractors</i>, and all persons attending the <i>Place of the Work</i> during the course of the <i>Project</i>."</p>
SC47.2	9.4.2	Amend GC 9.4.2 by <u>adding</u> the following words after "and the <i>Contractor</i> ": ", <i>Subcontractors</i> and <i>Suppliers</i> ".
SC47.3	9.4.3	Amend GC 9.4.3 by <u>adding</u> the following words after "and the <i>Contractor</i> ": ", <i>Subcontractors</i> and <i>Suppliers</i> ".
SC47.4	9.4.4	<p><u>Delete</u> GC 9.4.4 and replace it with the following:</p> <p>"9.4.4 The <i>Owner</i> undertakes to include in its contracts with other contractors and in its instructions to its own forces the requirement that the other contractor or its own forces, as the case may be, comply with the policies and procedures of and the directions and instructions from the <i>Contractor</i> with respect to occupational health and safety and related matters."</p>
SC47.5	9.4.5	<p><u>Delete</u> GC 9.4.5 in its entirety and <u>replace</u> it with the following:</p> <p>"9.4.5 Prior to the commencement of the <i>Work</i>, the <i>Contractor</i> shall submit to the <i>Owner</i>:</p> <ul style="list-style-type: none"> <li>.1 a current WSIB clearance certificate;</li> <li>.2 copies of the <i>Contractor's</i> insurance policies having application to the <i>Project</i> or certificates of insurance, at the option of the <i>Owner</i>;</li> <li>.3 documentation setting out the <i>Contractor's</i> in-house safety programs;</li> <li>.4 a copy of the Notice of Project filed with the Ministry of Labour naming itself as "constructor" under the <i>OHSA</i>; and</li> <li>.5 copies of any documentation or notices to be filed or delivered to the authorities having jurisdiction for the regulation of occupational health and safety at the <i>Place of the Work</i>;" </li></ul>
SC47.6	9.4.6 to 9.4.12	<p><u>Add</u> new GC 9.4.6, 9.4.7, 9.4.8, 9.4.9, 9.4.10, 9.4.11, and 9.4.12 as follows:</p> <p>"9.4.6 The <i>Contractor</i> shall indemnify and save harmless the <i>Owner</i>, its agents, trustees, officers, directors, employees, consultants, successors, appointees, and assigns from and against the consequences of any and all safety infractions committed by the <i>Contractor</i> under <i>OHSA</i> and any other occupational health and safety legislation in force at the <i>Place of the Work</i> including the payment of legal fees and disbursements on a solicitor and client basis. Such indemnity shall apply to the extent to which the <i>Owner</i> is not covered by insurance.</p> <p>9.4.7 If the <i>Owner</i> is of the reasonable opinion that the <i>Contractor</i> has not taken such precautions as are necessary to ensure compliance with the requirements of paragraph 9.4.1, the <i>Owner</i> may take any remedial measures which it deems necessary, including stopping the performance of all or any portion of the <i>Work</i>, and</p>



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		<p>the <i>Owner</i> may use its employees, the <i>Contractor</i>, any <i>Subcontractor</i> or any other contractors to perform such remedial measures.</p> <p>9.4.8 The <i>Contractor</i> shall file any notices or any similar document required pursuant to the <i>Contract</i> or the safety regulations in force at the <i>Place of the Work</i>. This duty of the <i>Contractor</i> will be considered to be included in the <i>Work</i> and no separate payment therefore will be made to the <i>Contractor</i>.</p> <p>9.4.9 Unless otherwise provided in the <i>Contract Documents</i>, the <i>Contractor</i> shall develop, maintain and supervise for the duration of the <i>Work</i> a comprehensive safety program that will effectively incorporate and implement all required safety precautions. The program shall, at a minimum, respond fully to the applicable safety regulations and general construction practices for the safety of persons or property, including, without limitation, any general safety rules and regulations of the <i>Owner</i> and any workers' compensation or occupational health and safety statutes or regulations in force at the <i>Place of the Work</i>.</p> <p>9.4.10 The <i>Contractor</i> shall provide a copy of the safety program described in GC 9.4.9 hereof to the <i>Consultant</i> for delivery to the <i>Owner</i> prior to the commencement of the <i>Work</i>, and shall, ensure, as far as it is reasonably practical to do so, that every employer and worker performing work in respect of the <i>Project</i> complies with such program.</p> <p>9.4.11 The <i>Contractor</i> shall arrange regular safety meetings, and shall supply and maintain, at its own expense, at its office or other well-known place at the job site, safety equipment necessary to protect the workers and general public against accident or injury as prescribed by the authorities having jurisdiction at the <i>Place of the Work</i>, including, without limitation, articles necessary for administering first-aid to any person and an emergency procedure for the immediate removal of any injured person to a hospital or a doctor's care.</p> <p>9.4.12 The <i>Contractor</i> shall promptly report in writing to the <i>Owner</i> and the <i>Consultant</i> all accidents of any sort arising out of or in connection with the performance of the <i>Work</i>, whether on or adjacent to the job site, giving full details and statement of witnesses. If death or serious injuries or damages are caused, the accident shall be promptly reported by the <i>Contractor</i> to the <i>Owner</i> and the <i>Consultant</i> by telephone or messenger in addition to any reporting required under the applicable safety regulations.”</p>
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**PART 10 GOVERNING REGULATIONS**

**SC48 GC 10.1 TAXES AND DUTIES**

SC48.1	10.1.2	<p><u>Amend</u> paragraph 10.1.2 by <u>adding</u> the following sentence to the end of the paragraph:</p> <p>“For greater certainty, the <i>Contractor</i> shall not be entitled to any mark-up for overhead or profit on any increase in such taxes and duties and the <i>Owner</i> shall not be entitled to any credit relating to mark-up for overhead or profit on any decrease in such taxes. The <i>Contractor</i> shall provide a detailed breakdown of <u>Additional taxes</u> if requested by the <i>Owner</i> in a form satisfactory to the <i>Owner</i>.”</p>
SC48.2	10.1.3	<p><u>Add</u> new paragraph 10.1.3 as follows:</p> <p>“10.1.3 Where the <i>Owner</i> is entitled to an exemption or a recovery of sales taxes, customs duties, excise taxes or <i>Value Added Taxes</i> applicable to the <i>Contract</i>, the <i>Contractor</i> shall, at the request of the <i>Owner</i>, assist with the application for any exemption, recovery or refund of all such taxes and duties and all amounts recovered or exemptions obtained shall be for the sole benefit of the <i>Owner</i>. The</p>



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		<i>Contractor</i> agrees to endorse over to the <i>Owner</i> any cheques received from the federal or provincial governments, or any other taxing authority, as may be required to give effect to this paragraph."
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**SC49 GC 10.2 LAWS, NOTICES, PERMITS, AND FEES**

SC49.1	10.2.5	<p><u>Amend</u> paragraph 10.2.5 by <u>adding</u> the words "Subject to paragraph 3.4" at the beginning of the paragraph.</p> <p>-and-</p> <p><u>Add</u> the following to the end of the second sentence:</p> <p>"...and no further <i>Work</i> on the affected components of the <i>Contract</i> shall proceed until these directives have been obtained by the <i>Contractor</i> from the <i>Consultant</i>."</p>
SC49.2	10.2.6	<p><u>Amend</u> paragraph 10.2.6 by <u>adding</u> the following sentence to the end of the paragraph:</p> <p>"In the event the <i>Owner</i> suffers loss or damage as a result of the <i>Contractor's</i> failure to comply with paragraph 10.2.5 and notwithstanding any limitations described in paragraph 12.1.1, the <i>Contractor</i> agrees to indemnify and to hold harmless the <i>Owner</i> and the <i>Consultant</i> from and against any claims, demands, losses, costs, damages, actions suits or proceedings resulting from such failure by the <i>Contractor</i>."</p>
SC49.3	10.2.7	<p><u>Amend</u> paragraph 10.2.7 by inserting the words "which changes were not, or could not have reasonably been known to the <i>Owner</i> or to the <i>Contractor</i>, as applicable, at the time of bid closing and which changes did not arise as a result of a public emergency or other <i>Force Majeure</i> event" to the second line, after the words "authorities having jurisdiction".</p>
SC49.4	10.2.8	<p><u>Add</u> new paragraph 10.2.8 as follows:</p> <p>"10.2.8 The <i>Contractor</i> shall furnish all certificates that are required or given by the appropriate governmental authorities as evidence that the <i>Work</i> as installed conforms with the laws and regulations of authorities having jurisdiction, including certificates of compliance for the <i>Owner's</i> occupancy or partial occupancy. The certificates are to be final certificates giving complete clearance of the <i>Work</i>, in the event that such governmental authorities furnish such certificates."</p>

**SC50 GC 10.4 WORKERS' COMPENSATION**

SC50.1	10.4.1	<p><u>Delete</u> paragraph 10.4.1 and <u>replace</u> with the following:</p> <p>"10.4.1 Prior to commencing the <i>Work</i>, and with each and every application for payment thereafter, including the <i>Contractor's</i> application for payment of the holdback amount following <i>Substantial Performance of the Work</i> and again with the <i>Contractor's</i> application for final payment, the <i>Contractor</i> shall provide evidence of compliance with workers' compensation legislation in force at the <i>Place of the Work</i>, including payments due thereunder."</p>
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**SC51 GC 11.1 INSURANCE**

SC51.1	11.1	<p><u>Delete</u> entirety of GC 11.1 and <u>replace</u> with the following:</p> <p><b>"GC 11.1 INSURANCE</b></p>
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		<p>11.1.1 Without restricting the generality of GC 12 – INDEMNIFICATION, the <i>Contractor</i> shall provide, maintain, and pay for the insurance coverages specified in GC 11.1 – INSURANCE. Unless otherwise stipulated, the duration of each insurance policy shall be from the date of commencement of the <i>Work</i> until the expiration of the warranty periods set out in the <i>Contract Documents</i>. Prior to commencement of the <i>Work</i> and upon the placement, renewal, <u>amendment</u>, or extension of all or any part of the insurance, the <i>Contractor</i> shall promptly provide the <i>Owner</i> with confirmation of coverage and, if required, a certified true copy of the policies certified by an authorized representative of the insurer together with copies of any <u>amending</u> endorsements.</p> <p><b>.1 General Liability Insurance</b></p> <p>General liability insurance shall be in the name of the <i>Contractor</i>, with the <i>Owner</i> and the <i>Consultant</i> named as <u>Additional</u> insureds, with limits of not less than \$10,000,000.00 inclusive per occurrence for bodily injury, death, and damage to property, including loss of use thereof, for itself and each of its employees, <i>Subcontractors</i> and/or agents. The insurance coverage shall not be less than the insurance required by IBC Form 2100, or its equivalent <u>replacement</u>, provided that IBC Form 2100 shall contain the latest edition of the relevant CCDC endorsement form. To achieve the desired limit, umbrella, or excess liability insurance may be used. All liability coverage shall be maintained for completed operations hazards from the date of <i>Ready-for-Takeover</i>, as set out in the certificate of <i>Ready-for-Takeover</i>, on an ongoing basis for a period of 6 years following <i>Ready-for-Takeover</i>. Where the <i>Contractor</i> maintains a single, blanket policy, the <u>Addition</u> of the <i>Owner</i> and the <i>Consultant</i> is limited to liability arising out of the <i>Project</i> and all operations necessary or incidental thereto. The policy shall be endorsed to provide the <i>Owner</i> with not less than 30 days' notice, in writing, in advance of any cancellation and of change or <u>amendment</u> restricting coverage.</p> <p><b>.2 Automobile Liability Insurance</b></p> <p>Automobile liability insurance in respect of licensed vehicles shall limits of not less than \$5,000,000.00 inclusive per occurrence for bodily injury, death and damage to property, covering all licensed vehicles <i>owned</i> or leased by the <i>Contractor</i>, and endorsed to provide the <i>Owner</i> with not less than 30 days' notice, in writing, in advance of any cancellation, change or <u>amendment</u> restricting coverage. Where the policy has been issued pursuant to a government-operated automobile insurance system, the <i>Contractor</i> shall provide the <i>Owner</i> with confirmation of automobile insurance coverage for all automobiles registered in the name of the <i>Contractor</i>.</p> <p><b>.3 Aircraft and Watercraft Liability Insurance</b></p> <p>Where determined necessary by the <i>Contractor</i>, acting reasonably, aircraft and watercraft liability insurance will be obtained in accordance with the provisions of paragraph 11.1.3. Aircraft and watercraft liability insurance with respect to owned or non-owned aircraft and watercraft if used directly or indirectly in the performance of the <i>Work</i>, including use of <u>Additional</u> premises, shall be subject to limits of not less than \$2,000,000.00 inclusive per occurrence for bodily injury, death and damage to property, including loss of use thereof and limits of not less than \$2,000,000.00 for aircraft passenger hazard. Such insurance shall be in a form acceptable to the <i>Owner</i>. The policies shall be endorsed to provide the <i>Owner</i> with not less than 30 days' notice, in writing, in advance of cancellation, change or <u>amendment</u> restricting coverage.</p> <p><b>.4 Property and Boiler and Machinery Insurance</b></p> <p>(1) Builder's Risk property insurance shall be in the name of the <i>Contractor</i> with the <i>Owner</i> and the <i>Consultant</i> named as <u>Additional</u> insureds. The policy shall</p>
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		<p>insure against all risks of direct physical loss or damage to the property insured which shall include all property included in the <i>Work</i>, whether owned by the <i>Contractor</i> or the owner or owned by others, so long as the property forms part of the <i>Work</i>. The property insured also includes all materials and supplies necessary to complete the work, whether installed in the work temporarily or permanently, in storage on the project site, or in transit to the project site, as well as temporary buildings, scaffolding, falsework forms, hoardings, excavation, site preparation and similar work. The insurance shall be for not less than the sum of the amount of the contract price and the full value of products that are specified to be provided by the owner for incorporation into the work, if applicable, with the deductible of \$10,000.00 payable by the contractor. The insurance shall include the foregoing and, otherwise, shall not be less than the insurance required by IBC Form 4042 or its equivalent <u>replacement</u> provided that the IBC Form 4042 shall include the latest <u>Addition</u> of the relevant CCDC endorsement form. The coverage shall be based on a completed value form and shall be maintained continuously until ten (10) days after the date of the final certificate of payment.</p> <p>(2) Boiler and machinery insurance shall be in the name of the <i>Contractor</i>, with the <i>Owner</i> and the <i>Consultant</i> named as <u>Additional</u> insureds, for not less than the <u>replacement</u> value of the boilers, pressure vessels and other insurable objects forming part of the <i>Work</i>. The insurance provided shall not be less than the insurance provided by the “Comprehensive Boiler and Machinery Form” and shall be maintained continuously from commencement of use or operation of the property insured and until 10 days after the date of the final certificate for payment.</p> <p>(3) The policies shall allow for partial or total use or occupancy of the <i>Work</i>.</p> <p>(4) The policies shall provide that, in the case of a loss or damage, payment shall be made to the <i>Owner</i> and the <i>Contractor</i> as their respective interests may appear. The <i>Contractor</i> shall act on behalf of the <i>Owner</i> for the purpose of adjusting the amount of such loss or damage payment with the insurers. When the extent of the loss or damage is determined, the <i>Contractor</i> shall proceed to restore the <i>Work</i>. Loss or damage shall not affect the rights and obligations of either party under the <i>Contract</i> except that the <i>Contractor</i> shall be entitled to such reasonable extension of the <i>Contract Time</i>, relative to the extent of the loss or damage, as determined by the <i>Owner</i>, in its sole discretion.</p> <p>(5) The <i>Contractor</i> shall be entitled to receive from the <i>Owner</i>, in <u>Addition</u> to the amount due under the <i>Contract</i>, the amount at which the <i>Owner’s</i> interest in restoration of the <i>Work</i> has been appraised, such amount to be paid as the restoration of the <i>Work</i> proceeds and as provided in GC 5.2 – APPLICATIONS FOR PROGRESS PAYMENT and GC 5.3 – PROGRESS PAYMENT. In <u>Addition</u>, the <i>Contractor</i> shall be entitled to receive from the payments made by the insurer the amount of the <i>Contractor’s</i> interest in the restoration of the <i>Work</i>.</p> <p>(6) In the case of loss or damage to the <i>Work</i> arising from the work of other contractors, or the <i>Owner’s</i> own forces, the <i>Owner</i>, in accordance with the <i>Owner’s</i> obligations under paragraph 3.2.2.4 of GC 3.2 – CONSTRUCTION BY OWNER OR OTHER CONTRACTORS, shall pay the <i>Contractor</i> the cost of restoring the <i>Work</i> as the restoration of the <i>Work</i> proceeds and as provided in GC 5.2 – APPLICATIONS FOR PROGRESS PAYMENT and GC 5.3 – PROGRESS PAYMENT.</p> <p><b>.5 Contractors’ Equipment Insurance</b></p> <p>“All risks” contractors’ equipment insurance covering construction machinery and equipment used by the <i>Contractor</i> for the performance of the <i>Work</i>, excluding boiler insurance, shall be in a form acceptable to the <i>Owner</i> and shall not allow subrogation claims by the insurer against the <i>Owner</i>. The policies shall be endorsed to provide the <i>Owner</i> with not less than 30 days’ notice, in writing, in</p>
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		<p>advance of cancellation, change or <u>amendment</u> restricting coverage. Subject to satisfactory proof of financial capability by the <i>Contractor</i> for self-insurance of his equipment, the <i>Owner</i> agrees to waive the equipment insurance requirement.</p> <p>11.1.2 The <i>Contractor</i> shall be responsible for deductible amounts under the policies except where such amounts may be excluded from the <i>Contractor's</i> responsibility by the terms of GC 9.1 - PROTECTION OF WORK AND PROPERTY and GC 9.2 - DAMAGES AND MUTUAL RESPONSIBILITY.</p> <p>11.1.3 Where the full insurable value of the <i>Work</i> is substantially less than the <i>Contract Price</i>, the <i>Owner</i> may reduce the amount of insurance required to waive the course of construction insurance requirement.</p> <p>11.1.4 If the <i>Contractor</i> fails to provide or maintain insurance as required by the <i>Contract Documents</i>, then the <i>Owner</i> shall have the right to provide and maintain such insurance and provide evidence of same to the <i>Contractor</i>. The <i>Contractor</i> shall pay the costs thereof to the <i>Owner</i> on demand, or the <i>Owner</i> may deduct the amount that is due or may become due to the <i>Contractor</i>.</p> <p>11.1.5 All required insurance policies shall be with insurers licensed to underwrite insurance in the jurisdiction of the <i>Place of the Work</i>."</p>
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#### SC52 \*NEW\* GC 11.2 CONTRACT SECURITY

SC52.1	GC 11.2	<p><u>Add</u> new GC 11.2 – CONTRACT SECURITY as follows:</p> <p><b>"GC 11.2 CONTRACT SECURITY</b></p> <p>11.2.1 The <i>Contractor</i> shall, prior to the execution of the <i>Contract</i>, furnish a performance bond and labour and material payment bond which meets the requirements under paragraph 11.2.2.</p> <p>11.2.2 The performance bond and labour and material payment bond shall:</p> <ol style="list-style-type: none"> <li>.1 be issued by a duly licensed surety company, which has been approved by the <i>Owner</i> and is permitted under the <i>Construction Act</i>,</li> <li>.2 be issued by an insurer licensed under the <i>Insurance Act</i> (Ontario) and authorized to transact a business of suretyship in the Province of Ontario;</li> <li>.3 shall be in the form prescribed by the <i>Construction Act</i>,</li> <li>.4 have a coverage limit of at least 50 per cent of the <i>Contract Price</i>, or such other percentage of the <i>Contract Price</i> as stated in the <i>Contract Documents</i>;</li> <li>.5 extends protection to <i>Subcontractors</i>, <i>Suppliers</i>, and any other persons supplying labour or materials to the <i>Project</i>; and</li> <li>.6 shall be maintained in good standing until the fulfillment of the <i>Contract</i>, including all warranty and maintenance periods set out in the <i>Contract Documents</i>..</li> </ol> <p>11.2.3 It is the intention of the parties that the performance bond shall be applicable to all of the <i>Contractor's</i> obligations in the <i>Contract Document</i> and, wherever a performance bond is provided with language which conflicts with this intention, it shall be deemed to be amended to comply. The <i>Contractor</i> represents and warrants to the <i>Owner</i> that it has provided its surety with a copy of the <i>Contract Documents</i> prior to the issuance of such bonds.</p>
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		<p>11.2.4 Without limiting the foregoing in any way, the bonds shall indemnify and hold harmless the <i>Owner</i> for and against costs and expenses (including legal and <i>Consultant</i> services and court costs) arising out of or as a consequence of any default of the <i>Contractor</i> under this <i>Contract</i>.</p> <p>11.2.4 The <i>Contractor</i> shall be responsible for notifying the surety company of any changes made to the <i>Contract</i> during the course of construction.</p> <p>11.2.5 The premiums for bonds required by the <i>Contract Documents</i> shall be included in the <i>Contract Price</i>.</p> <p>11.2.6 Should the <i>Owner</i> require additional bonds by the <i>Contractor</i> or any of his <i>Subcontractors</i>, after the receipt of bids for the <i>Work</i>, the <i>Contract Price</i> shall be increased by all direct costs attributable to providing such bonds. The <i>Contractor</i> shall promptly provide the <i>Owner</i>, through the <i>Consultant</i>, with any such bonds that may be required.”</p>
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### PART 12 OWNER TAKEOVER

#### SC53 GC 12.1 READY-FOR-TAKEOVER

SC53.1	12.1.1	<p><u>Delete</u> GC 12.1.1 in its entirety and <u>replace</u> it with the following:</p> <p>“12.1.1 <i>Ready-for-Takeover</i> shall be achieved when all of the following has occurred, as verified and approved by the <i>Owner</i>:</p> <ol style="list-style-type: none"> <li>.1 <i>Substantial Performance of the Work</i> has been achieved, as certified by the <i>Consultant</i>;</li> <li>.2 a permit for occupancy of the <i>Place of the Work</i> has been obtained from the authorities having jurisdiction;</li> <li>.3 the <i>Work</i> to be performed under the <i>Contract</i> has satisfied the requirements for deemed completion in accordance with Section 2(3) of the <i>Construction Act</i>;</li> <li>.4 final cleaning and waste removal, as required by the <i>Contract Documents</i>;</li> <li>.5 the <i>Contractor</i> has delivered to the <i>Consultant</i> and the <i>Owner</i> all inspection certificates from authorities having jurisdiction with respect to any component of the <i>Work</i> which has been completed;</li> <li>.6 subject only to GC 12.1.2, the entire <i>Work</i> has been completed to the requirements of the <i>Contract Documents</i>, including completion of all items on the punch list prepared at the time of <i>Substantial Performance of the Work</i> and the <i>Work</i> is being used for its intended purpose, and is so certified by the <i>Consultant</i>;</li> <li>.7 subject only to GC 12.1.2, the <i>Contractor</i> has submitted to the <i>Owner</i> and the <i>Consultant</i> in a collated and organized matter, all <i>Close-Out Documentation</i> and any other materials or documentation required by the <i>Contract Documents</i>;</li> <li>.8 subject only to GC 12.1.2, all <i>Products</i>, systems and components of the <i>Project</i> have been commissioned and certified for operation and accepted by the <i>Owner</i> and <i>Consultant</i>, and</li> </ol>
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		9 subject only to GC 12.1.2, the <i>Contractor</i> has submitted to the <i>Owner</i> and the <i>Consultant</i> full and complete as-built drawings and <i>Specifications</i> revised by the <i>Contractor</i> to reflect the as-built state of the <i>Work</i> , clearly showing changes to the <i>Drawings</i> and <i>Specifications</i> from the original <i>Contract Documents</i> , all of which have been approved by the <i>Owner</i> acting reasonably.”
SC53.2	12.1.2	<u>Delete</u> GC 12.1.2 in its entirety and <u>replace</u> it with the following:  “12.1.2 The <i>Owner</i> may, in its sole, absolute, and unfettered discretion, waive compliance with a requirement, or a part thereof, for achieving <i>Ready-for-Takeover</i> set out in GC 12.1.1.6 to 12.1.1.9 (inclusive). Where the <i>Owner</i> exercises the discretion afforded under this GC 12.1.2, the <i>Contractor</i> shall be required to comply with GC 5.5.1.2 as part of its application for final payment and the <i>Owner</i> and the <i>Contractor</i> , in consultation with the <i>Consultant</i> , shall establish a reasonable date for completing the <i>Work</i> .”
SC53.3	12.1.3	<u>Delete</u> GC 12.1.3 in its entirety and <u>replace</u> it with the following:  “12.1.3 When the <i>Contractor</i> considers the <i>Work Ready-for-Takeover</i> , it shall submit a written application to the <i>Owner</i> and the <i>Consultant</i> for review.”
SC53.4	12.1.4	In GC 12.1.4, <u>delete</u> the words “list and” from the second line.
SC53.5	12.1.5	<u>Delete</u> GC 12.1.5 in its entirety and <u>replace</u> it with the following:  “12.1.5 Following the confirmation of the date of <i>Ready-for-Takeover</i> by the <i>Consultant</i> and as confirmed by the <i>Owner</i> , the <i>Contractor</i> may submit a final application for payment in accordance with GC 5.5 – FINAL PAYMENT.”
SC53.6	12.1.6	<u>Delete</u> GC 12.1.6 in its entirety.

**SC54 GC 12.2 EARLY OCCUPANCY**

SC54.1	GC 12.2	<u>Delete</u> GC 12.2 – EARLY OCCUPANCY BY THE OWNER in its entirety, including all subparagraphs thereunder and <u>replace</u> it with the following:  “12.2.1 The <i>Owner</i> reserves the right to take possession of and use for any intended purpose any portion or all of the undelivered portion of the Project even though the <i>Work</i> may not have reached Substantial Performance of the <i>Work</i> , provided that such taking possession and use will not unduly interfere, in any material way, with the progress of the <i>Work</i> . The taking of possession or use of any such portion of the Project shall not be deemed to be the <i>Owner</i> ’s acknowledgement or acceptance of the <i>Work</i> or Project nor shall it relieve the <i>Contractor</i> of any of its obligations under the Contract.  12.2.2 Whether the Project contemplates <i>Work</i> by way of renovations in buildings which will be in use or be occupied during the course of the <i>Work</i> or where the Project involves <i>Work</i> that is adjacent to a structure which is in use or is occupied, the <i>Contractor</i> , without in any way limiting its responsibilities under this Contract, shall take all reasonable steps to avoid interference with fire exits, building access and egress, continuity of electric power and all other utilities, to suppress dust and noise and to avoid conditions likely to propagate mould or fungus of any kind and all other steps reasonably necessary to promote and maintain the safety and comfort of the users and occupants of such structures or adjacent structures.”
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**SC55 GC 12.3 WARRANTY**

SC55.1	12.3.2	<u>Delete</u> from the first line of paragraph 12.3.2 the word “The” and <u>replace</u> it with the words “Subject to GC 1.1.3, the...”
SC55.2	12.3.7 to 12.3.12	<p><u>Add</u> new paragraphs 12.3.7 to 12.3.12 as follows:</p> <p>“12.3.7 Where required by the <i>Contract Documents</i>, the <i>Contractor</i> shall provide a maintenance bond as security for the performance of the <i>Contractor’s</i> obligations as set out in GC 12.3 WARRANTY.</p> <p>12.3.8 The <i>Contractor</i> shall provide fully and properly completed and signed copies of all warranties and guarantees required by the <i>Contract Documents</i>, containing:</p> <ul style="list-style-type: none"> <li>.1 the proper name of the <i>Owner</i>;</li> <li>.2 the proper name and address of the <i>Project</i>;</li> <li>.3 the date the warranty commences, which shall be at the “<i>Ready-for-Takeover</i>” unless otherwise agreed upon by the <i>Consultant</i> in writing.</li> <li>.4 a clear definition of what is being warranted and/or guaranteed as required by the <i>Contract Documents</i>; and</li> <li>.5 the signature and seal (if required by the governing law of the <i>Contract</i>) of the company issuing the warranty, countersigned by the <i>Contractor</i>.</li> </ul> <p>12.3.9 Should any <i>Work</i> be repaired or replaced during the time period for which it is covered by the specified warranty, a new warranty shall be provided under the same conditions and for the same period as specified herein before. The new warranty shall commence at the completion of the repair or replacement.</p> <p>12.3.10 The <i>Contractor</i> shall ensure that its <i>Subcontractors</i> are bound to the requirements of GC 12.3 – WARRANTY for the <i>Subcontractor’s</i> portion of the <i>Work</i>.</p> <p>12.3.11 The <i>Contractor</i> shall ensure that all warranties, guarantees or other obligations for <i>Work</i>, services or <i>Products</i> performed or supplied by any <i>Subcontractor</i>, <i>Supplier</i> or other person in connection with the <i>Work</i> are obtained and available for the direct benefit of the <i>Owner</i>. In the alternative, the <i>Contractor</i> shall assign to the <i>Owner</i> all warranties, guarantees or other obligations for <i>Work</i>, services or <i>Products</i> performed or supplied by any <i>Subcontractor</i>, <i>Supplier</i> or other person in connection with the <i>Work</i> and such assignment shall be with the consent of the assigning party, where required by law, or by the terms of that party’s contract. Such assignment shall be in addition to, and shall in no way limit, the warranty rights of the <i>Owner</i> under the <i>Contract Documents</i>.</p> <p>12.3.12 The <i>Contractor</i> shall commence or correct any deficiency within 2 <i>Working Days</i> after receiving a <i>Notice in Writing</i> from the <i>Owner</i> or the <i>Consultant</i>, and shall complete the <i>Work</i> as expeditiously as possible, except in the case where the deficiency prevents maintaining security or where basic systems essential to the ongoing business of the <i>Owner</i> and/or its tenants cannot be maintained operational as designed. In those circumstances all necessary corrections and/or installations of temporary replacements shall be carried out immediately as an emergency service. Should the <i>Contractor</i> fail to provide this emergency service within 8 hours of a request being made during the normal business hours of the <i>Contractor</i>, the <i>Owner</i> is authorized, notwithstanding GC 3.1, to carry out all necessary repairs or replacements at the <i>Contractor’s</i> expense.”</p>



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**PART 13 INDEMNIFICATION AND WAIVER**

**SC56 GC 13.1 INDEMNIFICATION**

SC56.1	GC 13.1	<p><u>Delete</u> GC 13.1 – INDEMNIFICATION in its entirety and <u>replace</u> it with the following:</p> <p>“13.1.1 The <i>Contractor</i> shall indemnify and hold harmless the <i>Owner</i>, its parent, subsidiaries and affiliates, their respective partners, trustees, officers, directors, agents and employees and the <i>Consultant</i> from and against any and all claims, liabilities, expenses, demands, losses, damages, actions, costs, suits, or proceedings (hereinafter called “claims”), whether in respect of claims suffered by the <i>Owner</i> or in respect of claims by third parties, that directly or indirectly arise out of, or are attributable to, the acts or omissions of the <i>Contractor</i>, its employees, agents, <i>Subcontractors</i>, <i>Suppliers</i> or any other persons for whom it is in law responsible (including, without limitation, claims that directly or indirectly arise out of, or are attributable to, loss of use or damage to the <i>Work</i>, the <i>Owner’s</i> property or equipment, the <i>Contractor’s</i> property or equipment or equipment or property adjacent to the <i>Place of the Work</i> or death or injury to the <i>Contractor’s</i> personnel).</p> <p>13.1.2 The <i>Owner</i> shall indemnify and hold the <i>Contractor</i>, its agents and employees harmless from and against claims, demands, losses, costs, damages, actions, suits or proceedings arising out of the <i>Contractor’s</i> performance of the <i>Contract</i> which are attributable to a lack of or defect in title or an alleged lack of or defect in title to the <i>Place of the Work</i>.</p> <p>13.1.3 The provisions of GC 13.1 - INDEMNIFICATION shall survive the termination of the <i>Contract</i>, howsoever caused and no payment or partial payment, no issuance of a final certificate of payment and no occupancy in whole or in part of the <i>Work</i> shall constitute a waiver or release of any of the provisions of GC 13.1</p> <p>13.1.4 Notwithstanding the provisions of GC1.1 - CONTRACT DOCUMENTS, GC 1.1.6, GC13.1 - INDEMNIFICATION shall govern over the provisions of GC 1.3.1 of GC1.3 – RIGHTS AND REMEDIES.”</p>
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**SC57 GC 13.2 WAIVER OF CLAIMS**

SC57.13	13.2.1	<p>In paragraph 13.2.1 in the third line after the word “limitation” <u>add</u> the words “claims for delay pursuant to GC 6.5 DELAYS”</p> <p>-and-</p> <p><u>add</u> the words “(collectively “<b>Claims</b>”)” after “<i>Ready-for-Takeover</i>” in the fourth line.</p>
SC57.14	13.2.1.1	<p>In subparagraph 13.2.1.1, in each instance change the word “claims” to “Claims” and change the word “claim” to “Claim”.</p>
SC57.15	13.2.1.2	<p>In subparagraph 13.2.1.2 change the word “claims” to “Claims”.</p>
SC57.16	13.2.1.3	<p><u>Delete</u> subparagraph 13.2.1.3 in its entirety.</p>
SC57.17	13.2.1.4	<p>In paragraph 13.2.1.4 change the word “claims” to “Claims”.</p>
SC57.18	13.2.2.1	<p>In paragraph 13.2.2.1 <u>delete</u> the words “in paragraphs 13.2.1.2 and 13.2.1.3” and <u>replace</u> them with “in paragraph 13.2.1.2”</p> <p>-and-</p> <p>change the word “claims” to “Claims” in both instances and change the word “claim” to “Claim”.</p>



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SC57.19	13.2.3	<u>Delete</u> paragraph 13.2.3 in its entirety.
SC57.20	13.2.4	<u>Delete</u> paragraph 13.2.4 in its entirety.
SC57.21	13.2.5	<u>Delete</u> paragraph 13.2.5 in its entirety.
SC57.22	13.2.6	In paragraph 13.2.6 change the word “claim” to “Claim” in all instances in the paragraph.
SC57.23	13.2.8	In paragraph 13.2.8 change “The party” to “The <i>Contractor</i> ”  -and-  change the word “claim” to “Claim” in all instances in the paragraph.
SC57.24	13.2.9	In paragraph 13.2.9 <u>delete</u> the words “under paragraphs 13.2.1 or 13.2.3” and <u>replace</u> them with “under paragraph 13.2.1”  -and-  change both instances of the words “the party” to “the <i>Contractor</i> ”. Change the word “claim” to “Claim” in all instances in the paragraph.

**SC58 \*NEW\* PART 14 OTHER PROVISIONS**

SC58.1	14.1	<u>Add</u> new PART 14 – OTHER PROVISIONS as follows:  <b>“PART 14 OTHER PROVISIONS</b>  <b>GC 14.1 OWNERSHIP OF MATERIALS</b>  14.1.1 Unless otherwise specified, all materials existing at the <i>Place of the Work</i> at the time of execution of the <i>Contract</i> shall remain the property of the <i>Owner</i> . All <i>Work</i> and <i>Products</i> delivered to the <i>Place of the Work</i> by the <i>Contractor</i> shall be the property of the <i>Owner</i> . The <i>Contractor</i> shall remove all surplus or rejected materials as its property when notified in writing to do so by the <i>Consultant</i> .”
SC58.2	14.2	<u>Add</u> new GC 14.2 – CONSTRUCTION LIENS as follows:  <b>“GC 14.2 LIENS</b>  14.2.1 Notwithstanding any other provision in the <i>Contract</i> , the <i>Consultant</i> shall not be obligated to issue a certificate, and the <i>Owner</i> shall not be obligated to make payment, subject to the <i>Owner’s</i> requirement to issue a <i>Notice of Non-Payment</i> (Form 1.1) to the <i>Contractor</i> , if at the time such certificate or payment was otherwise due:  .1 a claim for lien has been registered against the <i>Project</i> lands by a <i>Subcontractor</i> or a <i>Supplier</i> that has not been vacated or discharged by the <i>Contractor</i> in accordance with the requirements of this <i>Contract</i> , or  .2 if the <i>Owner</i> or a mortgagee of the <i>Project</i> lands has received a written notice of a lien that has not been resolved by the <i>Contractor</i> through the posting of security or otherwise.  14.2.2 In the event a construction lien arising from the performance of the <i>Work</i> is registered or preserved against the <i>Project</i> lands by a <i>Subcontractor</i> or a <i>Supplier</i> , or a written notice of a lien is given or a construction lien action is commenced



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		<p>against the <i>Owner</i> by a <i>Subcontractor</i> or a <i>Supplier</i>, then the <i>Contractor</i> shall, at its own expense:</p> <ol style="list-style-type: none"> <li>.1 within 10 calendar days of registration of the construction lien, vacate or discharge the lien from title to the premises (i.e. the <i>Place of the Work</i>). If the lien is merely vacated, the <i>Contractor</i> shall, if requested, undertake the <i>Owner's</i> defence of any subsequent action commenced in respect of the lien, at the <i>Contractor's</i> sole expense;</li> <li>.2 within 10 calendar days of receiving notice of a written notice of a lien, post security with the Ontario Superior Court of Justice so that the written notice of a lien no longer binds the parties upon whom it was served; and</li> <li>.3 satisfy all judgments and pay all costs arising from such construction liens and actions and fully indemnify the <i>Owner</i> against all costs and expenses arising from same, including legal costs on a full indemnity basis.</li> </ol> <p>14.2.3 In the event that the <i>Contractor</i> fails or refuses to comply with its obligations pursuant to paragraph 14.2.2, the <i>Owner</i> shall, at its option, be entitled to take all steps necessary to address any such construction liens including, without limitation and in addition to the <i>Owner's</i> rights under paragraph 13.2.4, the posting of security with the Ontario Superior Court of Justice to vacate the claim for lien from title to the <i>Project</i> lands, and in so doing will be entitled to a full indemnity from the <i>Contractor</i> for all legal fees, security, disbursements and other costs incurred and will be entitled to deduct same from amounts otherwise owing to the <i>Contractor</i>.</p> <p>14.2.4 In the event that any <i>Subcontractor</i> or <i>Supplier</i> registers any claim for lien with respect to all or part of the <i>Place of Work</i>, the <i>Owner</i> shall have the right to withhold, in addition to the statutory holdback, the full amount of said claim for lien plus either: (a) \$250,000 if the claim for lien is in excess of \$1,000,000 or (b) 25% of the value of the claim for lien and to bring a motion to vacate the registration of said claim for lien and any associated certificate of action in respect of that lien, in accordance with Section 44 of the <i>Act</i>, by paying into court as security the amount withheld.</p> <p>14.2.5 Nothing in this GC 14.2 serves to preclude the <i>Contractor</i> from preserving and perfecting its lien in the event of non-payment by the <i>Owner</i>."</p>
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**APPENDIX 1**  
**to the Supplementary Conditions**

**Project-specific requirements for a “*Proper Invoice*”**

To satisfy the requirements for a *Proper Invoice*, the following criteria, as may be applicable in each case, must be included with the *Contractor's* application for payment:

- .1 the written bill or request for payment must be in writing;
- .2 the *Contractor's* name and current address;
- .3 the *Contractor's* HST registration number;
- .4 the date the application for payment was prepared by the *Contractor*;
- .5 the period of time in which the services or materials were supplied to the *Owner*;
- .6 the purchase order number provided by the *Owner*;
- .7 reference to the provisions of the *Contract* under which payment is being sought (e.g. GC 5.3 –PAYMENTS for progress payments, GC 5.4 – SUBSTANTIAL PERFORMANCE OF THE WORK AND PAYMENT OF HOLDBACK GC 5.5 – FINAL PAYMENT for final payment, etc.);
- .8 a description, including quantities where appropriate, of the services or materials, or a portion thereof, that were supplied and form the basis of the *Contractor's* request for payment;
- .9 the amount the *Contractor* is requesting to be paid by the *Owner*, set out in a statement based on the schedule of values approved under GC 5.2.4, separating out any statutory or other holdbacks, set-offs and HST;
- .10 a sworn Statutory Declaration in the form CCDC 9A-2018, only for second and subsequent progress payments;
- .11 a current Workplace Safety Insurance Board clearance certificate;
- .12 a pre-approved schedule of values, supplied by the *Contractor*, for Divisions 1 through 14 of the *Specifications* (or equivalent Construction Specifications Institute Masterformat) of the *Work*, aggregating the total amount of the *Contract Price*, including all supporting invoicing;
- .13 a separate pre-approved schedule of values, supplied by each *Subcontractor*, for each of Division 15, 16, and 17 of the *Specifications* (or equivalent Construction Specifications Institute Masterformat) of the *Work*, aggregating the total amount of the *Contract Price*, including all supporting invoicing;
- .14 invoices and other supporting documentation for all claims against the cash allowance;
- .15 a current, acceptable, and up to date *Construction Schedule Update*;
- .16 if requested by the *Owner*, a current and valid certificate(s) of insurance as required under GC 11.1 – INSURANCE;
- .17 the name, title, telephone number and mailing address of the person at the place of business of the *Contractor* to whom payment is to be directed;
- .18 a current, up to date, and approved *Shop Drawing* log;
- .19 in the case of the *Contractor's* application for final payment, in addition to the foregoing requirements (as applicable):
  - (a) any *Close-Out Documentation*, together with complete and final as-built drawings;



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- (b) the *Contractor's* written request for release of the deficiency holdback, including a statement that no written notices of lien have been received by it;
- (c) the *Contractor's* written certification that there are no outstanding claims, pending claims or future claims from the *Contractor* or their *Subcontractors* or *Suppliers*; and
- (d) sufficient evidence of the *Contractor's* compliance with GC 3.11.



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**APPENDIX 2**  
**to the Supplementary Conditions**

**SPECIAL SUPPLEMENTARY CONDITIONS**

The Standard Construction Document CCDC 2 2020 for a Stipulated Price Contract, English version, consisting of the Agreement Between *Owner* and Contractor, Definitions and General Conditions of the Stipulated Price Contract, Parts 1 to 12 inclusive, governing same, together with the changes with the new Construction Act is hereby made part of these Contract Documents, with the following amendments, additions and modifications:

**SC59 ARTICLE A-10 TIME OF THE ESSENCE**

SC59.1	Article A-10	<p><u>Delete</u> the header for Article A-10 being “ARTICLE A-10 TIME OF THE ESSENCE” and <u>replace</u> it with the following:</p> <p><b>“ARTICLE A-10 TIME OF THE ESSENCE/LIQUIDATED DAMAGES”.</b></p>
SC59.2	Articles 10.3 to 10.7	<p><u>Insert</u> the following new Articles 10.3 to 10.7 as follows:</p> <p>10.3 The <i>Contractor</i> further acknowledges that it understands that the <i>Owner</i> is responsible and must account to the students and staff of Waterloo Catholic District School Board. A failure by the <i>Contractor</i> to attain <i>Ready-for-Takeover</i> within the time prescribed in the Contract could result in damages to the <i>Owner</i> and to the students and staff of the Waterloo Catholic District School Board, which would be difficult or impractical to quantify but would nevertheless have a significant negative impact on the <i>Owner</i> and its ability to provide services the <i>Owner</i> is obliged to provide to the students and staff of the Waterloo Catholic District School Board.</p> <p>10.4 Given the significance of the requirement for the Contractor to achieve <i>Ready-for-Takeover</i>, as described in Article A-10.3, without limiting the <i>Owner’s</i> entitlement to any additional or other damages, if the <i>Contractor</i> fails to achieve <i>Ready-for-Takeover</i> by the time prescribed in Article A-1, the <i>Owner</i> will incur substantial damages and the extent of such damages shall be incapable or very difficult to accurately measure. Nonetheless, the parties acknowledge that as of the effective date of this <i>Contract</i>, the amount of liquidated damages set forth in Article A-10.5 below represents a good faith estimate on the part of the parties as to the actual potential damages that the <i>Owner</i> would suffer as a result of late completion of the <i>Project</i>. The amount of such liquidated damages does not include any penalty. Notwithstanding the foregoing, the <i>Owner</i> shall be entitled to the greater of (i) the liquidated damages as calculated pursuant to Article A-10.5, or (ii) in the event that the <i>Contractor</i> claims that this liquidated damages provision is invalid or unenforceable and the <i>Contractor</i> prevails on such a defence, the damages arising from the delay suffered by the <i>Owner</i> including, without limitation, consequential, special, incidental, and indirect damages, costs and expenses incurred or suffered by the <i>Owner</i>.</p> <p>10.5 The <i>Contractor</i> shall pay to the <i>Owner</i> (or have deducted from <i>Contract</i> payments) liquidated damages of \$ _____ <b>[NTD: Include per diem rate]</b> for each calendar day of delay beyond the prescribed date for <i>Ready-for-Takeover</i>, until <i>Ready-for-Takeover</i> is achieved and certified pursuant to the terms of the <i>Contract</i>. Liquidated damages will be assessed as incurred and reflected as deductions from amounts that may be due under any applications for payment pending at the time that such liquidated damages are assessed.</p> <p>10.6 All liquidated damages that have not been deducted from payments prior to final payment shall be deducted from the final payment to be made by the <i>Owner</i> to the <i>Contractor</i> pursuant to GC 5.5 FINAL PAYMENT, and any amount of liquidated</p>



**SUPPLEMENTARY CONDITIONS**  
**AMENDMENTS TO CCDC 2 – 2020**  
**STIPULATED PRICE CONTRACT (Version May 2022)**

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		<p>damages in excess of the final payment amount, shall be paid by the <i>Contractor</i> to the <i>Owner</i>, within 30 calendar days following a written demand by the <i>Owner</i> for such payment.</p> <p>10.7 The liquidated damages payable under this Article A-10 are in addition to and without prejudice to any other remedy, action or any other alternative claim that may be available to the <i>Owner</i>.”</p>
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**END OF AMENDMENTS TO CCDC 2 - 2020**

## **1. GENERAL**

### **1. REPORTS**

1. The attached Asbestos Audit Update prepared by MTE Consultants Inc, dated February 25, 2025, File No. C61104\_003 is enclosed for reference.
2. This information given in this report was obtained for the use of the Owner in the execution of the design. It is presented in good faith to assist the Contractors and their sub-trades.
3. It is incumbent upon the Contractors to make whatever additional materials investigation they feel may be required for the proper execution of the Contract at no additional cost to the Owner.

### **2. SCOPE OF WORK**

1. The work of asbestos abatement including identified ceiling tile removals are part of the Base Demolition Contract. This work will be done by the Contractor prior to demolition.
2. It is incumbent upon the Contractors to make whatever additional materials investigation they feel may be required for the proper execution of the Contract at no additional cost to the Owner

### **3. SITE CONDITIONS**

1. Examine the conditions on the site, present site conditions.

### **4. RELATED WORK SPECIFIED ELSEWHERE**

1. Selective Demolition – 02225
2. Gypsum Wallboard - 09250
3. Resilient Flooring - 09650

## **2. PRODUCTS**

### **1. AWARENESS OF HAZARDOUS MATERIALS**

1. Each Contractor shall be constantly aware of the possible discovery of additional unknown hazardous materials. Should the Contractor encounter any hazardous material or suspected hazardous material, the Contractor shall immediately stop work in the area affected and report the condition to the Architect.
2. If the Contractor encounters any additional unknown hazardous material or suspected hazardous material, the Contractor agrees to immediately initiate the required procedures of the Canadian Environmental Protection Act, 1999, and/or federal or provincial agencies having jurisdiction to protect any and all persons exposed to the affected areas or areas

affected thereby.

3. Upon written notification by the Contractor to the Architect, the Contractor will engage an industrial hygienist to sample and test the suspected hazardous material.
  1. Should the test prove negative, and proper clearance obtained from the industrial hygienist, the work will then proceed.
  2. Should the test prove positive, the work will be put on hold and the Contractor will conduct corrective measures and/or disposal program in accordance with applicable laws and regulations.
4. The work in affected areas shall not be resumed until the Contractor has separately arranged for the hazardous material to be removed or rendered harmless, and the hazardous material is removed or rendered harmless in accordance with all applicable laws and regulations, and has been certified safe by appropriate authorities.
5. Each Contractor and/or Subcontractor shall be responsible to inform all of its employees on the site of the provisions in these paragraphs. Instruct each employee of the jobsite procedures in reporting any and all suspected materials.
6. Absolutely no material will be allowed on site that does not have a manufacturer's label stating contents.

**END OF SECTION.**



MTE Consultants

520 Bingham Centre Drive, Kitchener, Ontario N2B 3X9

February 25, 2025

MTE File No.: C61104\_003

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**RE: 2025 Asbestos Audit Update  
St. Anne Catholic Elementary School  
250 East Avenue, Kitchener, Ontario**

## **1.0 INTRODUCTION**

MTE Consultants Inc. (MTE) was authorized by the Waterloo Catholic District School Board (WCDSB) to conduct the 2025 asbestos inspection of the subject building.

The purpose of the assignment was to re-assess and document the location, type, and condition of identified asbestos-containing materials (ACM) present within the building and make appropriate recommendations for management, abatement or remedial activities, as required.

The audit was conducted in accordance with the Ontario Ministry of Labour, *Regulation 278/05- Designated Substance-Asbestos on Construction Projects and in Buildings and Repair Operations* (O. Reg. 278/05). This report shall replace previous audit reports.

## **2.0 SCOPE OF WORK**

The Scope of Work for this assessment was completed by MTE and included the following activities:

- Review of existing and historical reports and documentation pertaining to ACM within the building;
- Visual inspection to assess the condition of previously identified ACM, excluding portable structures;
- Collection of building material samples that are suspect ACM, as applicable;
- Submission of samples to an accredited laboratory, as applicable;
- Photographic log of damaged materials; and
- Preparation of this report with findings and recommendations.

## **3.0 METHODOLOGY AND ASSESSMENT CRITERIA**

This inspection was conducted by visual and laboratory identification methods for the assessment of ACM and their corresponding location, use, condition, and friability. The areas outlined in Section 2.0 were inspected limited to building components, materials and service connections. Notwithstanding that reasonable attempts were made to identify all ACMs, the

possibility of concealed material exists and may not become visible until substantial demolition has occurred and therefore are currently undocumented and did not include the following.

- Locations that may be hazardous to the surveyor, such as electrical equipment;
- Where invasive inspection could cause consequential damage to the property or impair the integrity of the equipment, such as roof systems, underground services or components of mechanical equipment;
- Locations concealed by building finishes that require substantial demolition or removal for access or determination of quantities;
- Materials that is present in such an inconsistent fashion that without complete removal of finishes, the extent cannot be determined;
- Non-permanent items or personal contents, furnishings; and
- Settled dust or airborne agents unless otherwise stated.

### 3.1 Condition of ACM

During the audit process the general condition of ACMs were observed and noted. Materials which are damaged can pose an increased exposure risk to workers, building occupants and the public. While assessing damage can be subjective, abatement items were grouped into two categories to aid in remedial prioritization:

#### Monitor Annually

These are items which display minor isolated damage; however, do not pose an immediate risk to workers from exposure to asbestos fibres due to the current condition of the material and/or location. No remediation is required at this time; however, these items should be monitored on a yearly basis for evidence of continued degradation. Should the condition of the material change an evaluation should be completed by a competent person to determine remedial action.

#### Abatement Action Required

These are items which display damage and may pose potential risk to workers from exposure to asbestos fibres due to the physical condition and/or location of the material. Clean-up, repair or removal of these materials is required as soon as reasonably possible.

## 4.0 FINDINGS

An inspection of building was conducted by MTE on February 18, 2025. The two-storey school building was constructed in 1947 with additions in 1949, 1954, 1960, 1964 and 2011. The inspection did not include areas of post 2011 new construction or renovation (where all building finishes have been removed and replaced).

The summary of identified ACM is provided in Table 1 of **Appendix A** and associated Figures are provided in **Appendix B**. These together provide a current summary of the ACM identified throughout the building.

The bulk asbestos sample location and analytical summary is provided in Table 2 of **Appendix A**.

### 4.1 Analytical Results

During this inspection, no samples were collected.

## 4.2 Removed ACM

No ACM has been removed since the previous audit.

## 4.3 Discovery of Additional ACM

No additional ACM or suspect ACM was identified.

## 4.4 Damaged ACM

Damaged ACM was identified and requires removal, repair or annual monitoring.

## 5.0 CONCLUSIONS AND RECOMMENDATIONS

A detailed summary of recommended actions is provided in **Appendix A**.

### 5.1 Remedial

Damaged ACM was identified and requires removal, repair or annual monitoring.

Any materials requiring annual monitoring display minor damage; however, do not pose an immediate risk to workers from exposure to asbestos fibres due to the current condition of the material and/or location. No remediation is required at this time; however, these items should be monitored on a yearly basis for evidence of continued degradation. Should the condition of the material change an evaluation should be completed by a competent person to determine remedial action.

All asbestos work must be conducted by contractors who are trained and experienced in the type of asbestos operations required, and should be overseen by a qualified third party Health, Safety and Environmental professional. In order to conduct Type 3 asbestos operations, contractors must be certified as Asbestos Abatement Workers AAW (Trade code 253W) and Asbestos Abatement Supervisors AAS (Trade code 253S) by The Ministry of Training, Colleges and Universities (Ministry of Advanced Education and Skills Development) as prescribed by Section 20 of O. Reg. 278/05.

### 5.2 Long Term Management

This audit was conducted for the long term management of ACM within the building. If any construction, renovation, alteration, or maintenance activities are required or planned, additional inspections are required. A Designated Substance Assessment is required prior to completing any demolition or renovation activities at a facility as outlined in the Section 30 OHS Act.

ACM may also be present in concealed locations. If any construction, renovation, alteration, or maintenance activities are required or planned, invasive inspections of concealed locations for potential ACM must be performed prior to such activities. Should any suspect ACM be discovered, work should cease and the materials should not be disturbed. Suspect ACM must be treated as asbestos-containing or sampled and proven to not contain asbestos. Any activities that require disturbance of ACM must be performed in accordance with O. Reg. 278/05.

There are no requirements under current legislation to remove ACM from a building simply because it is present. However, O. Reg. 278/05 requires that an Asbestos Management Program be implemented and maintained by the owner/employer where ACM is identified or suspected present.

## 6.0 LIMITATIONS

Services performed by **MTE Consultants Inc.** (MTE) were conducted in a manner consistent with the level of care and skill ordinarily exercised by members of the Environmental Engineering & Consulting profession. No other representation expressed or implied as to the accuracy of the information, conclusions or recommendations is included or intended in this report.

This report was completed for the sole use of MTE and The Client. It was completed in accordance with the approved Scope of Work referred to in this report. As such, this report may not deal with all issues potentially applicable to the site and may omit issues which are or may be of interest to the reader. MTE makes no representation that the present report has dealt with all important environmental features, except as provided in the Scope of Work. All findings and conclusions presented in this report are based on site conditions as they existed during the time period of the investigation. This report is not intended to be exhaustive in scope or to imply a risk-free facility.

Any use which a third party makes of this report, or any reliance on, or decisions to be made based upon it, are the responsibility of such third parties. MTE accepts no responsibility for liabilities incurred by or damages, if any, suffered by any third party as a result of decisions made or actions taken, based upon this report. Others with interest in the site should undertake their own investigations and studies to determine how or if the condition affects them or their plans.

It should be recognized that the passage of time may affect the views, conclusions and recommendations (if any) provided in this report because environmental conditions of a property can change. Should additional or new information become available, MTE recommends that it be brought to our attention in order that we may reassess the contents of this report.

If you have any further questions, please do not hesitate to call.

Yours Truly,

**MTE Consultants Inc.**

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JAS: smk  
Attach.

[https://mte85.sharepoint.com/sites/61104\\_003/Shared Documents/Reports/St Anne CES \(Kitchener\)/61104\\_003\\_2025-02-25\\_ltr rpt\\_Asbestos Audit Update\\_St Anne \(Kitchener\) CES.docx](https://mte85.sharepoint.com/sites/61104_003/Shared Documents/Reports/St Anne CES (Kitchener)/61104_003_2025-02-25_ltr rpt_Asbestos Audit Update_St Anne (Kitchener) CES.docx)






# Appendix A

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## Tables


**Table 1 - Summary of Asbestos-Containing Material and Recommended Actions**

**St. Anne Catholic Elementary School (Kitchener)**

Material	Location	Material Description	Approximate Quantity	Photograph	Management Requirements If No Impacts to Material	Recommended Actions If Material Will Be Or Likely Be Impacted By Maintenance, Renovation, Construction or Demolition Activities
Damaged Non-Friable	B013	Texture Finish on Ceiling	<1m <sup>2</sup>		Monitor Annually	Removal in accordance with O. Reg. 278/05 Type 2 Operation – hand held tools only with dust suppression or power tools with HEPA vacuum attachment in conjunction with dust suppression  OR  Type 3 Operation – power tools with no dust suppression
Damaged Non-Friable	B013	Texture Finish on Ceiling	<1m <sup>2</sup>		Monitor Annually	Removal in accordance with O. Reg. 278/05 Type 2 Operation – hand held tools only with dust suppression or power tools with HEPA vacuum attachment in conjunction with dust suppression  OR  Type 3 Operation – power tools with no dust suppression
Asbestos Friable	1024, 1029	Trowel-Applied Fire Proofing Insulation on Structural Beams	2m <sup>2</sup>		In place management in accordance with O. Reg. 278/05	Removal in accordance with O. Reg. 278/05 < 1m <sup>2</sup> as a Type 2 Operation and for > 1m <sup>2</sup> as a Type 3 Operation
Asbestos Friable	B001, 1029, 1034,	Insulation on Pipe Fittings	51		In place management in accordance with O. Reg. 278/05	Removal in accordance with O. Reg. 278/05 < 1m <sup>2</sup> as a Type 2 or Type 2 Glove Bag Operation and for > 1m <sup>2</sup> as a Type 2 Glove Bag or Type 3 Operation
Asbestos Non-Friable	1033	9" x 9" Black with White Streak Floor Tile	5m <sup>2</sup>		In place management in accordance with O. Reg. 278/05	Removal in accordance with O. Reg. 278/05 as a Type 1 Operation

**Table 1 - Summary of Asbestos-Containing Material and Recommended Actions**

**St. Anne Catholic Elementary School (Kitchener)**

Material	Location	Material Description	Approximate Quantity	Photograph	Management Requirements if No Impacts to Material	Recommended Actions if Material Will Be Or Likely Be Impacted By Maintenance, Renovation, Construction or Demolition Activities
<b>Asbestos Non-Friable</b>	B009, B012, B013, B014, 1007, 1009, 1010, 1012, 1021, 1035, 1036, 2009, 2010, 2011, 2012, 2014, 2013 2015	Hard Texture Coat on Ceiling (Walls in 1035, 1036)	1050m <sup>2</sup>		In place management in accordance with O. Reg. 278/05	Removal in accordance with O. Reg. 278/05 Type 2 Operation – hand held tools only with dust suppression or power tools with HEPA vacuum attachment in conjunction with dust suppression  OR  Type 3 Operation – power tools with no dust suppression
<b>Suspect Asbestos Non-Friable</b>	Exterior of Building	Roofing materials (Paper/Felts/Mastics/Sealants)	-	-	In place management in accordance with O. Reg. 278/05	Sample prior to maintenance/renovations/ construction/demolition activities and if confirmed ACM, removal in accordance with O. Reg. 278/05
<b>Suspect Asbestos Non-Friable</b>	Exterior/Interior of Building	Exterior/Interior Sealants in Windows/Doors	-	-	In place management in accordance with O. Reg. 278/05	Sample prior to maintenance/renovations/ construction/demolition activities and if confirmed ACM, removal in accordance with O. Reg. 278/05
<b>Suspect Asbestos Non-Friable</b>	Exterior of Building	Brick Mortar	-	-	In place management in accordance with O. Reg. 278/05	Sample prior to maintenance/renovations/ construction/demolition activities and if confirmed ACM, removal in accordance with O. Reg. 278/05
<b>Potentially Concealed Asbestos</b>	Interior of Building	Floor Mastics and Leveling Compounds	-	-	In place management in accordance with O. Reg. 278/05	Invasive sampling prior to maintenance/renovations/construction/demolition activities, if sampling confirms as ACM, removal in accordance with O. Reg. 278/05
<b>Potentially Concealed Asbestos</b>	Electrical Wiring Throughout Interior of Building	Jacketing on Electrical Wiring	-	-	In place management in accordance with O. Reg. 278/05	Invasive inspection prior to maintenance/renovations/construction/demolition activities, if present and sampling confirms as ACM, removal in accordance with O. Reg. 278/05
<b>Potentially Concealed Asbestos</b>	Doors Throughout Building	Door Core Insulation	-	-	In place management in accordance with O. Reg. 278/05	Invasive inspection prior to maintenance/renovations/construction/demolition activities, if present and sampling confirms as ACM, removal in accordance with O. Reg. 278/05
<b>Potentially Concealed Asbestos</b>	Wall Cavities, Attic Spaces	Vermiculite Loose-Fill Insulation	-	-	In place management in accordance with O. Reg. 278/05	Invasive inspection prior to maintenance/renovations/construction/demolition activities, if present and sampling confirms as ACM, removal in accordance with O. Reg. 278/05
<b>Potentially Concealed Asbestos</b>	Dome Light Fixtures	Heat Shields	-	-	In place management in accordance with O. Reg. 278/05	Invasive inspection prior to maintenance/renovations/construction/demolition activities, if present and sampling confirms as ACM, removal in accordance with O. Reg. 278/05
<b>Potentially Concealed Asbestos</b>	Toilet Fixtures	Pipe Gasket/Flange at Floor Connection	-	-	In place management in accordance with O. Reg. 278/05	Invasive inspection prior to maintenance/renovations/construction/demolition activities, if present and sampling confirms as ACM, removal in accordance with O. Reg. 278/05
<b>Potentially Concealed Asbestos</b>	Concealed by Wall/Ceiling/Exterior Finishes	Asbestos Cement (Transite) Sheets	-	-	In place management in accordance with O. Reg. 278/05	Invasive inspection prior to maintenance/renovations/construction/demolition activities, if present and sampling confirms as ACM, removal in accordance with O. Reg. 278/05
<b>Potentially Concealed Asbestos</b>	Underground Piping Systems	Asbestos Cement (Transite) Pipe	-	-	In place management in accordance with O. Reg. 278/05	Invasive inspection prior to maintenance/renovations/construction/demolition activities, if present and sampling confirms as ACM, removal in accordance with O. Reg. 278/05

**Table 1 Summary of ACM for St. Anne (Kitchener) CES**

**Table 1 - Summary of Asbestos-Containing Material and Recommended Actions**

**St. Anne Catholic Elementary School (Kitchener)**

<b>Material</b>	<b>Location</b>	<b>Material Description</b>	<b>Approximate Quantity</b>	<b>Photograph</b>	<b>Management Requirements If No Impacts to Material</b>	<b>Recommended Actions If Material Will Be Or Likely Be Impacted By Maintenance, Renovation, Construction or Demolition Activities</b>
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**Notes:**

- 1) A copy of this report should be provided to all prospective contractors prior to tender or quotation, in accordance with Section 30 of the Occupational Health and Safety Act.
- 2) Recommended actions are the minimum required actions, as prescribed by the appropriate Acts, regulations, guidelines, standards, codes and general best practice measures. Prior to demolition, the Contractor may choose to alter the approach and combine or break out sections of work. This is acceptable provided that the appropriate Acts, regulations, guidelines, standards and codes are followed and afford protection for the health and safety of workers, occupants and the public that is at least equal to the protection that would be provided by complying with the minimum requirements.
- 3) All waste generated is subject to characterization and disposal in accordance with Ontario Regulation 347.

**TABLE 2: BULK ASBESTOS SAMPLING SUMMARY**

Sample #	Location	Material Description	Asbestos Content (%)	Fibre Type	Is Material ACM
<b>2006 - Asbestos Audit Update</b>					
STA-B-BOYSWR-PL-01	B005	Plaster	ND	-	No
STA-B-BOYSWR-PL-02	B005	Plaster	ND	-	No
STA-B-BOYSWR-PL-03	B005	Plaster	0.1	Chrysotile	No
STA-B-LIBRARY-PL-01	B013	Plaster	ND	-	No
STA-B-LIBRARY-PL-02	B013	Plaster	ND	-	No
STA-B-LIBRARY-PL-03	B013	Plaster	ND	-	No
STA-1ST-HALL-2X2CT	1034	Ceiling tile	ND	-	No
STA-2nd-NURSE-PL-01	2013	Plaster	ND	-	No
STA-2nd-NURSE-PL-02	2013	Plaster	ND	-	No
STA-2nd-NURSE-PL-03	2013	Plaster	ND	-	No
STA-1ST-HALL-RM7-12x12CT	1021	Ceiling Tile	ND	-	No
<b>STA-1ST-JR-ELBOW</b>	<b>1020</b>	<b>Pipe Fitting</b>	<b>40</b>	<b>Chrysotile</b>	<b>Yes</b>
STA-1ST-RM4-12x12CT	1030	Ceiling tile	ND	-	No
STA-1st-GIRLSWASH-PL-01	1018	Plaster	ND	-	No
STA-1st-GIRLSWASH-PL-02	1018	Plaster	ND	-	No
STA-1st-GIRLSWASH-PL-03	1018	Plaster	ND	-	No
<b>2009 - Asbestos Audit Update</b>					
<b>32961-101-STA-S01A</b>	<b>2015</b>	<b>Ceiling Texture Coat</b>	<b>2</b>	<b>Chrysotile</b>	<b>Yes</b>
<b>32961-101-STA-S01B</b>	<b>2011</b>	<b>Ceiling Texture Coat</b>	<b>2</b>	<b>Chrysotile</b>	<b>Yes</b>
<b>32961-101-STA-S01C</b>	<b>1007</b>	<b>Ceiling Texture Coat</b>	<b>2</b>	<b>Chrysotile</b>	<b>Yes</b>
<b>32961-101-STA-S01D</b>	<b>1035</b>	<b>Ceiling Texture Coat</b>	<b>2</b>	<b>Chrysotile</b>	<b>Yes</b>
<b>32961-101-STA-S01E</b>	<b>B011</b>	<b>Ceiling Texture Coat</b>	<b>2</b>	<b>Chrysotile</b>	<b>Yes</b>
<b>32961-101-STA-S02A</b>	<b>1029</b>	<b>Firespray on Structural Beam</b>	<b>10</b>	<b>Chrysotile</b>	<b>Yes</b>
<b>32961-101-STA-S02B</b>	<b>1029</b>	<b>Firespray on Structural Beam</b>	<b>10</b>	<b>Chrysotile</b>	<b>Yes</b>
<b>32961-101-STA-S02C</b>	<b>1029</b>	<b>Firespray on Structural Beam</b>	<b>8</b>	<b>Chrysotile</b>	<b>Yes</b>
STA-1st-HALLRM4-12x12CT-2	Stairwell	12x12 Thick Fissure Random Pinhole Ceiling Tile	ND	-	No
STA-1st-HALLRM4-12x12CT-3	Stairwell	12x12 Thick Fissure Random Pinhole Ceiling Tile	ND	-	No
STA-1st-HALLRM7-12x12CT-2	1021	12x12 Pinhole Ceiling Tile	ND	-	No
STA-1st-HALLRM7-12x12CT-3	1021	12x12 Pinhole Ceiling Tile	ND	-	No
<b>2016 - Asbestos Audit Update (March 30)</b>					
S01a	2002	12" x 12" Floor Tile - Blue Dense Fleck & Mastic	ND	-	No
S01a	2002	Floor Tile Mastic	ND	-	No
S01b	2002	12" x 12" Floor Tile - Blue Dense Fleck & Mastic	ND	-	No
S01b	2002	Floor Tile Mastic	ND	-	No
S01c	2002	12" x 12" Floor Tile - Blue Dense Fleck & Mastic	ND	-	No
S01c	2002	Floor Tile Mastic	ND	-	No
S02a	2002	12" x 12" Floor Tile – White Dense Fleck	ND	-	No
S02b	2002	12" x 12" Floor Tile – White Dense Fleck	ND	-	No
S02c	2002	12" x 12" Floor Tile – White Dense Fleck	ND	-	No
S03a	2004	12" x 12" Floor Tile – Thick Beige Dense Fleck & Mastic	ND	-	No
S03a	2004	Floor Tile Mastic	ND	-	No
S03b	2004	12" x 12" Floor Tile – Thick Beige Dense Fleck & Mastic	ND	-	No
S03b	2004	Floor Tile Mastic	ND	-	No
S03c	2004	12" x 12" Floor Tile – Thick Beige Dense Fleck & Mastic	ND	-	No
S03c	2004	Floor Tile Mastic	ND	-	No
S04a	2005	12" x 12" Floor Tile - Orange Fleck & Mastic	ND	-	No
S04a	2005	Floor Tile Mastic	ND	-	No
S04b	2005	12" x 12" Floor Tile - Orange Fleck & Mastic	ND	-	No
S04b	2005	Floor Tile Mastic	ND	-	No
S04c	2005	12" x 12" Floor Tile - Orange Fleck & Mastic	ND	-	No
S04c	2005	Floor Tile Mastic	< MDL	Chrysotile	No
S05a	2005	12" x 12" Floor Tile – Thick Grey Dense Fleck	ND	-	No
S05b	2005	12" x 12" Floor Tile – Thick Grey Dense Fleck	ND	-	No
S05c	2005	12" x 12" Floor Tile – Thick Grey Dense Fleck	ND	-	No
<b>S06a</b>	<b>1033</b>	<b>9" x 9" Floor Tile – Black with White Streak</b>	<b>3.45</b>	<b>Chrysotile</b>	<b>Yes</b>

**Table 2 Sample Summary Table for St. Anne (Kitchener) CES**

**TABLE 2: BULK ASBESTOS SAMPLING SUMMARY**

Sample #	Location	Material Description	Asbestos Content (%)	Fibre Type	Is Material ACM
S06a	1033	Floor Tile Mastic	< MDL	Chrysotile	No
<b>S06b</b>	<b>1033</b>	<b>9" x 9" Floor Tile – Black with White Streak</b>	<b>NA</b>	<b>Chrysotile</b>	<b>Yes</b>
S06b	1033	Floor Tile Mastic	ND	-	No
<b>S06c</b>	<b>1033</b>	<b>9" x 9" Floor Tile – Black with White Streak</b>	<b>NA</b>	<b>Chrysotile</b>	<b>Yes</b>
S06c	1033	Floor Tile Mastic	ND	-	No
S07a	B001	12" x 12" Floor Tile – Beige Dense & Mastic	ND	-	No
S07a	B001	Floor Tile Mastic	ND	-	No
S07b	B001	12" x 12" Floor Tile – Beige Dense & Mastic	ND	-	No
S07b	B001	Floor Tile Mastic	ND	-	No
S07c	B001	12" x 12" Floor Tile – Beige Dense & Mastic	ND	-	No
S07c	B001	Floor Tile Mastic	ND	-	No
S08a	2010WR	12" x 12" Floor Tile – Brown Dense Fleck	ND	-	No
S08b	2010WR	12" x 12" Floor Tile - Brown Dense Fleck	ND	-	No
S08c	2010WR	12" x 12" Floor Tile - Brown Dense Fleck	ND	-	No
S09a	2014	12" x 12" Floor Tile – Light Blue Dense Fleck & Mastic	ND	-	No
S09a	2014	Floor Tile Mastic	ND	-	No
S09b	2014	12" x 12" Floor Tile – Light Blue Dense Fleck & Mastic	ND	-	No
S09b	2014	Floor Tile Mastic	ND	-	No
S09c	2014	12" x 12" Floor Tile – Light Blue Dense Fleck	ND	-	No
S10a	2014	12" x 12" Floor Tile – Pink Dense Fleck	ND	-	No
S10b	2014	12" x 12" Floor Tile – Pink Dense Fleck	ND	-	No
S10c	2014	12" x 12" Floor Tile – Pink Dense Fleck	ND	-	No
S11a	1013	12" x 12" Floor Tile –Blue with Blue/White Fleck & Mastic	ND	-	No
S11a	1013	Floor Tile Mastic	ND	-	No
S11b	1013	12" x 12" Floor Tile –Blue with Blue/White Fleck	ND	-	No
S11c	1013	12" x 12" Floor Tile –Blue with Blue/White Fleck	ND	-	No
<b>S12a</b>	<b>1013</b>	<b>9" x 9" Floor Tile – Green</b>	<b>3.45</b>	<b>Chrysotile</b>	<b>Yes</b>
S12a	1013	Floor Tile Mastic	< MDL	Chrysotile	No
<b>S12b</b>	<b>1013</b>	<b>9" x 9" Floor Tile – Green</b>	<b>NA</b>	<b>Chrysotile</b>	<b>Yes</b>
<b>S12c</b>	<b>1013</b>	<b>9" x 9" Floor Tile – Green</b>	<b>NA</b>	<b>Chrysotile</b>	<b>Yes</b>
<b>2016 - Revised Asbestos Audit Update (April 28)</b>					
S01A	1010	Grey Sealant/Mortar on Block Windows	ND	-	No
S01B	1012	Grey Sealant/Mortar on Block Windows	ND	-	No
S01C	1009	Grey Sealant/Mortar on Block Windows	ND	-	No
S02A	1009	White Sealant on Door Frame	ND	-	No
S02B	1009	White Sealant on Door Frame	ND	-	No
S02C	1009	White Sealant on Door Frame	ND	-	No
S03A	1005	White Sealant on Steel Window Fames	ND	-	No
S03B	1005	White Sealant on Steel Window Fames	ND	-	No
S03C	1005	White Sealant on Steel Window Fames	ND	-	No
S04A	1005	White Sealant on Painted Door Frames	ND	-	No
S04B	1005	White Sealant on Painted Door Frames	ND	-	No
S04C	1005	White Sealant on Painted Door Frames	ND	-	No
<b>S05A</b>	<b>1023</b>	<b>Grey Sealant on Block Window Framing</b>	<b>3</b>	<b>Chrysotile</b>	<b>Yes</b>
<b>S05B</b>	<b>1023</b>	<b>Grey Sealant on Block Window Framing</b>	<b>NA</b>	<b>Chrysotile</b>	<b>Yes</b>
<b>S05C</b>	<b>1023</b>	<b>Grey Sealant on Block Window Framing</b>	<b>NA</b>	<b>Chrysotile</b>	<b>Yes</b>
<b>2019 - Asbestos Audit Update</b>					
S01A	1002	Drywall Joint Compound (1954 Addition)	ND	-	No
S01B			ND	-	No
S01C			ND	-	No
S02A	1004	Plaster (1954 Addition)	ND	-	No
S02B			ND	-	No
S02C			ND	-	No
S03A	1028	Drywall Joint Compound (1964 Addition)	ND	-	No
S03B			ND	-	No
S03C			ND	-	No
S04A	1028	Plaster (1964 Addition)	ND	-	No
S04B			ND	-	No
S04C			2018	ND	-

**Table 2 Sample Summary Table for St. Anne (Kitchener) CES**

**TABLE 2: BULK ASBESTOS SAMPLING SUMMARY**

Sample #	Location	Material Description	Asbestos Content (%)	Fibre Type	Is Material ACM
S05A	1015	Drywall Joint Compound (1960 Addition)	ND	-	No
S05B			ND	-	No
S05C			ND	-	No
S06A	1028	1'x1' Ceiling Tile - Thick Fissure Random Pinhole	ND	-	No
S06B			ND	-	No
S06C			ND	-	No
<b>2019 - Asbestos Audit Update (Additional Sampling #1)</b>					
S01A	1964 Addition	White Sealant on Interior Door Frames (1964 Addition)	ND	-	No
S01B			ND	-	No
S01C			ND	-	No
S02A	1964 Addition	Beige Sealant on Interior Window Frames (1964 Addition)	ND	-	No
S02B			ND	-	No
S02C			ND	-	No
S03A	1960 Addition	Black Sealant on Exterior Door Panes (1960 Addition)	ND	-	No
S03B			ND	-	No
S03C			ND	-	No
S04A	1954 Addition	Grey Sealant on Interior Window Frames (1954 Addition)	ND	-	No
S04B			ND	-	No
S04C			ND	-	No
<b>2019 - Asbestos Audit Update (Additional Sampling #2)</b>					
S01A	1026	9x9 VFT - Red	1	Chrysotile	Yes
S01B	1026	9x9 VFT - Red	NA	Chrysotile	Yes
S01C	1026	9x9 VFT - Red	NA	Chrysotile	Yes
S01A	1026	9x9 VFT - Red - Black Mastic	3	Chrysotile	Yes
S01B	1026	9x9 VFT - Red - Black Mastic	NA	Chrysotile	Yes
S01C	1026	9x9 VFT - Red - Black Mastic	NA	Chrysotile	Yes
S01A	1026	9x9 VFT - Red - Brown Mastic	ND	-	No
S01B	1026	9x9 VFT - Red - Brown Mastic	ND	-	No
S01C	1026	9x9 VFT - Red - Brown Mastic	ND	-	No
S02A	1025	9x9 VFT - Grey	5	Chrysotile	Yes
S02B	1025	9x9 VFT - Grey	NA	Chrysotile	Yes
S02C	1025	9x9 VFT - Grey	NA	Chrysotile	Yes
S02A	1026	9x9 VFT - Grey - Black Mastic	3	Chrysotile	Yes
S02B	1026	9x9 VFT - Grey - Black Mastic	NA	Chrysotile	Yes
S02C	1026	9x9 VFT - Grey - Black Mastic	NA	Chrysotile	Yes
S02A	1026	9x9 VFT - Grey - Brown Mastic	ND	-	No
S02B	1026	9x9 VFT - Grey - Brown Mastic	ND	-	No
S02C	1026	9x9 VFT - Grey - Brown Mastic	ND	-	No
S03A	1033	9x9 VFT - Blue	1	Chrysotile	Yes
S03B	1033	9x9 VFT - Blue	NA	Chrysotile	Yes
S03C	1033	9x9 VFT - Blue	NA	Chrysotile	Yes
S03A	1026	9x9 VFT - Blue - Black Mastic	5	Chrysotile	Yes
S03B	1026	9x9 VFT - Blue - Black Mastic	NA	Chrysotile	Yes
S03C	1026	9x9 VFT - Blue - Black Mastic	NA	Chrysotile	Yes
S03A	1026	9x9 VFT - Blue - Brown Mastic	ND	-	No
S03B	1026	9x9 VFT - Blue - Brown Mastic	ND	-	No
S03C	1026	9x9 VFT - Blue - Brown Mastic	ND	-	No
S04A	1002	9x9 VFT - Biege	1	Chrysotile	Yes
S04B	1002	9x9 VFT - Biege	NA	Chrysotile	Yes
S04C	1002	9x9 VFT - Biege	NA	Chrysotile	Yes
S04A	1026	9x9 VFT - Beige - Black Mastic	ND	-	No
S04B	1026	9x9 VFT - Beige - Black Mastic	ND	-	No
S04C	1026	9x9 VFT - Beige - Black Mastic	ND	-	No
S05A	1001	9x9 VFT - Dark Green	1	Chrysotile	Yes
S05B	1001	9x9 VFT - Dark Green	NA	Chrysotile	Yes
S05C	1001	9x9 VFT - Dark Green	NA	Chrysotile	Yes
S05A	1001	9x9 VFT - Dark Green - Black Mastic	ND	-	No
S05B	1001	9x9 VFT - Dark Green - Black Mastic	ND	-	No
S05C	1001	9x9 VFT - Dark Green - Black Mastic	ND	-	No

Table 2 Sample Summary Table for St. Anne (Kitchener) CES

**TABLE 2: BULK ASBESTOS SAMPLING SUMMARY**

Sample #	Location	Material Description	Asbestos Content (%)	Fibre Type	Is Material ACM
S06A	1012	9x9 VFT - Dark Blue	6	Chrysotile	Yes
S06B	1012	9x9 VFT - Dark Blue	NA	Chrysotile	Yes
S06C	1012	9x9 VFT - Dark Blue	NA	Chrysotile	Yes
S06A	1012	9x9 VFT - Dark Blue - Black Mastic	ND	-	No
S06B	1012	9x9 VFT - Dark Blue - Black Mastic	ND	-	No
S06C	1012	9x9 VFT - Dark Blue - Black Mastic	ND	-	No
S08A	1009	9x9 VFT - Tan	5	Chrysotile	Yes
S08B	1009	9x9 VFT - Tan	NA	Chrysotile	Yes
S08C	1009	9x9 VFT - Tan	NA	Chrysotile	Yes
S08A	1009	9x9 VFT - Tan - Black Mastic	ND	-	No
S08B	1009	9x9 VFT - Tan - Black Mastic	ND	-	No
S08C	1009	9x9 VFT - Tan - Black Mastic	ND	-	No
S09A	1008	9x9 VFT - Dark Grey	5	Chrysotile	Yes
S09B	1008	9x9 VFT - Dark Grey	NA	Chrysotile	Yes
S09C	1008	9x9 VFT - Dark Grey	NA	Chrysotile	Yes
S09A	1008	9x9 VFT - Dark Grey - Black Mastic	ND	-	No
S09B	1008	9x9 VFT - Dark Grey - Black Mastic	ND	-	No
S09C	1008	9x9 VFT - Dark Grey - Black Mastic	ND	-	No
S10A	2013	VFT - Black Mastic	ND	-	No
S10B	2013	VFT - Black Mastic	ND	-	No
S10C	2013	VFT - Black Mastic	ND	-	No
S11A	2014	12x12 VFT - Beige	1	Chrysotile	Yes
S11B	2014	12x12 VFT - Beige	NA	Chrysotile	Yes
S11C	2014	12x12 VFT - Beige	NA	Chrysotile	Yes
S11A	2014	12x12 VFT - Beige - Brown Mastic	ND	-	No
S11B	2014	12x12 VFT - Beige - Brown Mastic	ND	-	No
S11C	2014	12x12 VFT - Beige - Brown Mastic	ND	-	No
S12A	2002	9x9 VFT - Light Green	1	Chrysotile	Yes
S12B	2002	9x9 VFT - Light Green	NA	Chrysotile	Yes
S12C	2002	9x9 VFT - Light Green	NA	Chrysotile	Yes
S12A	2002	9x9 VFT - Light Green - Black Mastic	2	Chrysotile	Yes
S12B	2002	9x9 VFT - Light Green - Black Mastic	NA	Chrysotile	Yes
S12C	2002	9x9 VFT - Light Green - Black Mastic	NA	Chrysotile	Yes
S13A	2005	9x9 VFT - Olive	3	Chrysotile	Yes
S13B	2005	9x9 VFT - Olive	NA	Chrysotile	Yes
S13C	2005	9x9 VFT - Olive	NA	Chrysotile	Yes
S13A	2005	9x9 VFT - Olive - Black/Yellow Mastic	ND	-	No
S13B	2005	9x9 VFT - Olive - Black/Yellow Mastic	ND	-	No
S13C	2005	9x9 VFT - Olive - Black/Yellow Mastic	ND	-	No
S14	2001	Vermiculite	1	Tremolite	Yes
<b>2019 - Asbestos Audit Update (Additional Sampling #3)</b>					
S01A	-	9x9 VFT - Green - Black Mastic	1	Chrysotile	Yes
S01B	-	9x9 VFT - Green - Black Mastic	NA	Chrysotile	Yes
S01C	-	9x9 VFT - Green - Black Mastic	NA	Chrysotile	Yes

NA: Not Analyzed due to stop positive method ND: No asbestos fibres detected above the laboratory minimum detection limit

A bulk material sample containing 0.5% or more asbestos therefore establishes that material as asbestos-containing. In accordance with Table 1 of O. Reg. 278/05, a minimum number of samples for the material to be classified as non asbestos. A homogeneous material is defined by O. Reg. 278/05 "as material that is uniform in colour and texture". Homogeneous samples are identified by an alphabetical suffix to sample names to represent multiple samples of a homogeneous material. When a homogeneous material is analysed it is determined to be asbestos-containing upon the first positive detection of asbestos equal to or greater than 0.5%. Subsequent samples of the same material are therefore not analysed. Some bulk samples are comprised of multiple layers and as such will require multiple analysis. In such cases each layer is isolated at the laboratory and analysed individually to determine asbestos content. As a result the laboratory may report additional samples beyond the submitted number of samples or include multiple analyses as subsets within a sample.

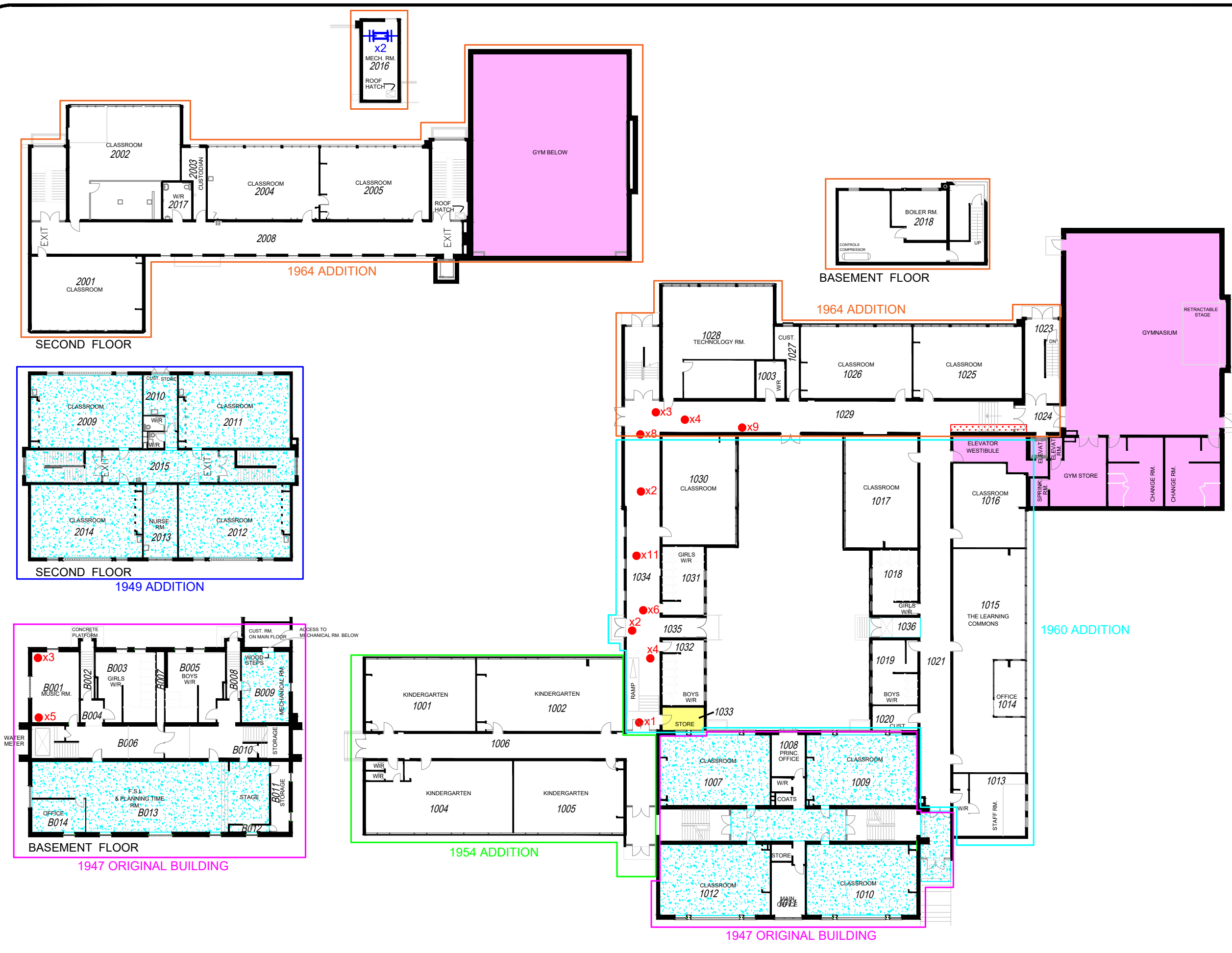
Table 2 Sample Summary Table for St. Anne (Kitchener) CES

# Appendix B

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## Figures





**NOTES:**  
 ALL DRAWINGS TO BE REFERENCED WITH THE ASSOCIATED REPORT, LOCATIONS AND QUANTITIES ARE APPROXIMATE.  
 ALL KNOWN OR SUSPECT ASBESTOS-CONTAINING MATERIALS ARE NOT DEPICTED ON THIS DRAWING. REFER TO THE REPORT FOR A COMPLETE LIST OF IDENTIFIED MATERIALS.  
 THIS FIGURE IS COLOUR DEPENDENT. PHOTOCOPIES MAY ALTER INTERPRETATION OF THE FIGURE. ALWAYS REFER TO ORIGINAL DRAWINGS AND REPORT.

**Legend**

13 Location Number

No Access

Post 1990 Construction

**Asbestos-Containing Materials (ACM):**

- Floor Tile
- Rolled Flooring
- Ceiling Tile
- Friable Soft Textured Ceiling
- Non-Friable Hard Textured Ceiling
- Spray-On Fire Proofing
- Transite (Asbestos Cement) Paneling
- Duct Insulation
- x2(1) Pipe Fitting Insulation w Quantity (Brackets Indicate # of Damaged Fittings)
- Pipe Insulation (Vertical and Horizontal)
- Transite (Asbestos Cement) Pipe (Vertical and Horizontal)
- x2(1) Duct Expansion Joints w Quantity (Brackets Indicate # of Damaged Joints)
- Friable Debris

**MTE**  
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**CLIENT**  
 WATERLOO CATHOLIC DISTRICT SCHOOL BOARD

**PROJECT**  
 2025 ASBESTOS AUDIT UPDATE

**DRAWING**  
 ST. ANNE CATHOLIC ELEMENTARY SCHOOL (Kitchener)  
 FIRST LEVEL

Project Manager	PXS	Date	MARCH 2025
Design By	WCDSB	Project No.	61104_003
Drawn By	SGL	Drawing No.	1.0
Scale	N.T.S.		

**1. GENERAL**

1. Unless specified otherwise, the following instructions shall apply to all sections of the work.
2. Conform to the Procurement Restriction Policy of Ontario.

This Procurement Restriction Policy (Policy) is designed to restrict United States (U.S.) businesses from accessing public sector procurements in Ontario.

It is in force as a response to U.S. tariffs on Canadian products and services.

Should tariffs be lifted, this Policy would be assessed and may be adjusted or rescinded.

- Public sector entities must exclude U.S. businesses from procurements.
- Procuring from a U.S. business is allowed only when:
  - a. a U.S. business is the only viable source for the good/service, and
  - b. the procurement cannot be delayed.
- For clarity, both of these conditions must be met.

A U.S. business means a supplier, manufacturer or distributor of any business structure (includes a sole proprietorship, partnership, corporation or other business structure) that:

1. has its headquarters or main office located in the U.S., and
2. has fewer than 250 full-time employees in Canada at the time of the applicable procurement process.

If a bidder or vendor is a subsidiary of another corporation, part 1 of the definition above is met if that bidder or vendor is controlled by a corporation that has its headquarters or main office located in the U.S.

This Policy applies:

- to all new procurements of goods and services (consulting and non-consulting) at any value, regardless of the method of procurement — invitational, open competitive or non-competitive.

According with the provincial policy above, when a specification section lists multiple manufacturers as acceptable, the bidder shall include in their bid amount products manufactured in Canada or elsewhere, unless a U.S. business is the only viable source for the good/service, and the procurement cannot be delayed. This policy overrides the priority of first named product in the specifications. In addition, bidders shall offer Canadian made alternative products where none are listed in the specifications to the architect for review and approval by addendum prior to tender close.

In accordance with GC 10.1.1 of CCDC 2, The Contract Price shall include all taxes and customs duties. Tariffs are considered to be customs duties and shall therefore be included in the bid price should the Bidder has no other option but to carry a U.S. sourced good/service. Should the Bidder fail to include these tariff's in their bid price, the Owner shall bear no responsibility in compensating for such past the tender closing date.

This policy should significantly reduce the amount of tariffs that may become an issue after award of the contract. Any applicable tariffs at time of tender are required to be included in the base bid. Any claims for unknown tariffs after the contract is awarded would need to be reviewed on a case-by-case basis and accompanied by official documentation.

3. Conform to The latest Ontario Building Code, CEC CSA C22, CAN3-B44 and CSA W59.1 - latest amendments, where applicable, to the Canadian Code for Construction Safety, as currently amended, and to the Construction Safety Act, Ont. as currently amended, and to all other applicable codes and Building By-Laws hereinafter referred to as Codes; and to the requirements of the authorities having jurisdiction, including public utilities, referred to in the Contract Documents as the authorities.
4. Conform to regulations of Municipality having jurisdiction regarding clean up of tracking on streets and protection of sidewalks and curbs, and all other applicable laws, By-laws and Regulations.
5. Read General Work - Section 01015, for instructions and requirements regarding General Work and Services, Miscellaneous Work and Services and Temporary Work and Services. Trades requiring own offices, sheds, etc. shall provide, maintain, relocate and remove same in a manner satisfactory to Contractor.
6. Establish rates of wages, hours and conditions of work, in accordance with Provincial Codes and as generally recognized and accepted in locality. Wherever possible, give preference to use of local labour, building mechanics, suppliers and subcontractors.
7. Install and arrange ducts, piping, tubing, conduit, equipment and fixtures in such a way as to conserve head room and space as much as possible, to provide minimum interference and to be neat, orderly and tidy. Unless otherwise noted, run pipes, ducts, tubing and conduit vertical, horizontal and square with building grid. Conceal pipes, ducts, tubing and conduit above ceilings, behind furrings, in walls, except in mechanical rooms, equipment rooms and unfinished spaces, unless indicated or specified otherwise.
8. In all cases where a device or part of the equipment is herein referred to in the singular number, it is intended that such reference shall apply to as many such devices as are required to complete the installation.
9. Definitions
  1. Wherever the words 'approved', 'satisfactory', 'directed', 'permitted', 'inspected', 'instructed', 'required', 'submit', 'ordered', or similar words or

phrases are used in the Contract Documents, it shall be understood, unless the context provides otherwise, that the words 'by (to) the Architect' follow.

2. The words 'by others' when used in the Specifications or on the Drawings shall not mean by someone other than the Trade Contractor. The only means by which something shown or specified shall be indicated as not being in the Contract is by the use of the initials 'NIC' or the words 'not in (the) Contract', 'by Client', or by another Contractor.
3. Exposed: means when visible by the occupants at completion of the work, unless scheduled or specified otherwise.
4. The use of scope, related work, or similar articles in the specifications shall not relieve the contractor from their responsibility to assign the various parts of the work to the appropriate subcontractors and forces and shall not impose upon the Architect or Client the duty to arbitrate disputes between the Contractor and the Subcontractor, nor shall it relieve the subcontractors from their responsibility for carefully examining all the Drawings and Specifications and coordinating their work with each other and the Contractor.

## **2. CO-OPERATION**

1. Co-operate and co-ordinate with other trades as required, for satisfactory and expeditious completion of work. Take field dimensions relative to work. Fabricate and erect work to suit field dimensions and field conditions. Provide forms, templates, anchors, sleeves, inserts and accessories required to be fixed to, or inserted in work, and set in place or instruct related trades as to their location. Pay cost of extra work caused by and make up time lost, as a result of failure to provide in adequate time, the necessary co-operative information of items to be fixed to, or built in.
2. Allow for four (4) site tours by County staff to be scheduled throughout construction. Provide safety helmets and vests for twelve (12) persons. It is the Contractors responsibility to lead the tour to ensure safe passage through the work area.

## **3. MATERIALS**

1. See Article 27 of the General Conditions.
2. Reject material damaged in transit. Store packaged materials in original undamaged containers with manufacturer's labels and seals intact. Handle and store materials in accordance with manufacturers' and suppliers' recommendations. Prevent damage. Remove from site and replace damaged materials.
3. Conform to the Products, tables and standards in Section 01016 for the following:
  1. Metals
  2. Gauges & Equivalent Thickness

3. Glass
4. Concrete, Masonry, Paving
5. Finish for Aluminum, Baked on Coatings
6. Pencil Hardness Test
7. Finish for Aluminum, Hard Anodizing

#### **4. EXAMINATION**

1. The Contractor affirms that before tendering, they did examine the site and ascertain the extent and nature of all conditions affecting the performance of the work including the existing conditions; and including the location of all buried services which may have to be protected, removed or relocated. No extras will be allowed for anything which would have been revealed in the course of such an examination.
2. The Contractor affirms that before tendering they did examine the Specifications, Drawings, and other tender documents thoroughly. It shall be assumed that the Contractor thoroughly understands these documents, including those particular items about which questions have been asked and written instructions given.
3. Examine work upon which your work depends. Application of your work or any part of it shall be deemed acceptance of work upon which your work, or that part of it which has been applied, depends.
4. Drawings are in part, diagrammatic and incomplete, and are intended to convey scope of work and indicate general and approximate location, arrangement and size of fixtures, equipment, ducts, piping, conduit and outlets. Obtain more accurate information about locations, arrangement and sizes, from study and coordination of construction drawings, including architectural, structural, mechanical and electrical and become familiar with conditions and spaces affecting these matters before proceeding with work.
5. Where job conditions require reasonable changes in indicated location and arrangements, make changes at no extra cost to Client. Install and arrange ducts, piping, conduit, equipment and fixtures in such a way as to conserve head room and space as much as possible.

#### **5. SCAFFOLDING**

1. The Contractor shall provide at their own expense all manner of materials, labour, scaffolding, ladders, hand tools, and appliances necessary for the due execution and proper completion of work described herein, unless otherwise specified in tender specifications.
2. Erect scaffolding independent of walls. Use scaffolding so as to interfere as little

as possible with other trades. When not in use, move scaffolding as necessary to permit installation of other work. Construct and maintain scaffolding in rigid, secure and safe manner. Remove scaffolding promptly when no longer required. Scaffolding must comply to Occupational Health and Safety Act.

**6. FLOOR SURFACES**

1. Adequately protect existing and new floors and finishes from damage. Take special measures when moving heavy loads or equipment on them.
2. Keep floors free of oils, grease, or other material likely to damage them, discolour them, or affect bond of applied finishes.
3. Once building is enclosed, keep floors as dry as possible after curing.

**7. PROTECTION AND MAKING GOOD**

1. Protect existing property, adjacent public and private property and work of other sections from damage while doing work.
2. Damaged work and property shall be made good (includes replacing, fixing, re-finishing) wherever possible by those performing work originally, but at expense of those causing damage.
3. Attach and fasten fixtures and fittings in place in safe, sturdy, secure manner so that they cannot work loose or fall or shift out of position during occupancy of building as a result of vibration or other causes in normal use of building.
4. If, during work, any buildings, curbs, walks, roads or landscaping are damaged, repair or replace them to the satisfaction of Architect and the local jurisdiction.
5. Protect glass and other finishes against heat, slag and weld spatter, by erecting sturdy plywood or other heavy shield.
6. If tape or strippable coatings are used to protect finished metal surfaces, do not allow them to become baked on or to thermoset.

**8. IMPACT DRIVEN FASTENINGS**

1. Do not use impact driven (explosive, hammer, etc., but not twist driven) fastening devices without written approval. Properly size holes in concrete and drill cleanly to avoid oversizing for expansion anchors. When drilling upward, use jig to hold drill steady and plumb.

**9. ALTERATIONS AND MAKING GOOD**

1. Wherever it becomes necessary to cut or interfere in any manner with existing services and apparatus, do so at such times as approved by the Architect. Give minimum advance notice of one week and provide sufficient information of such requirements.
2. Take into account existing installations to ensure best arrangement of pipes,

conduit, ducts and mechanical, electrical and other equipment in available space. For critical locations, prepare interference and installation drawings showing work of various sections as well as existing installations, for approval, before commencing work.

3. Comply with Section 01045 Cutting and Patching for additional information

#### **10. STANDARDS**

1. Where initials of an organization are used, followed by number or combination of numerals and letters, this designates a standard produced by the organization. Conform to issue of standard so designated, as amended and revised to date of contract. When designation does not indicate particular edition of standard edition current at date of Contract shall apply.
2. Wherever a standard confers upon a person, a body politic or a body corporate the right to approve, to select, to exercise authority or to interpret the standard, and refers to that person, body politic or body corporate as the Authority having jurisdiction, the Authority, the Engineer, the Department, the Purchaser, the Contracting Officer (e.g. U.S. Fed. Spec.) or by some other such designation, the Architect shall have the right to exercise the powers of any such person, body politic, or body corporate.
3. Where standards and manufacturer's instructions conflict with the Contract Documents, the Contract Documents shall govern.

#### **11. FINISHED DIMENSIONS AND ELEVATIONS**

1. See Article on Setting Out, in Section 01015. Give particular attention to finished dimensions and elevations of the work. Make finished work fit indicated spaces accurately. Make finished work flush, plumb, true to lines and levels and accurate in all respects

#### **12. NON-PAYMENT**

1. All those doing work or supplying materials shall notify the Architect in writing if the Contractor fails to make payment when due. Failing such notice, the Architect will assume that payments have been duly made.

#### **13. CLEANING AND CONTRACT CLOSE-OUT**

1. Conduct cleaning and disposal operations to comply with local ordinances and anti-pollution laws.
2. Store volatile wastes in covered metal containers, and remove from premises daily.
3. Prevent accumulation of wastes which create hazardous conditions.
4. Provide adequate ventilation during use of volatile or noxious substances.

5. Use only cleaning materials recommended by manufacturer on surface to be cleaned, and as recommended by cleaning material manufacturer.
6. See G.C. 3 of the General Conditions of the Contract.
7. Cleaning During Construction
  1. The successful Contractor will be responsible to maintain the work areas and designated storage areas in a neat, orderly and clean condition and remove all excess materials and/or garbage from the site, daily.
  2. Provide on-site containers for collection of waste materials and rubbish. Location to be co-ordinated with Architect.
  3. Remove waste materials and rubbish from site on an ongoing basis.
  4. Clean interior building work areas daily or as needed, until work is complete
  5. Schedule cleaning operations so that dust and other contaminants resulting from cleaning process will not fall on wet, newly painted surfaces.
  6. Promptly as the work proceeds and on completion, each Contractor shall clean up and remove from the premises all rubbish, surplus materials and equipment resulting from their work. Follow General Contractor's instructions regarding disposal of rubbish.
  7. Before final inspection, replace glass and mirrors that have been broken, damaged and/or etched during construction, or which are otherwise defective.
  8. Include in Work final cleaning by skilled cleaning specialists on completion of construction.
  9. Remove temporary protections and make good defects before commencement of final cleaning.
  10. Remove dust, stains, paint spots, soil, grease, fingerprints and accumulations of construction materials, interior and exterior to the building. Perform cleaning in accordance with installer's instructions for each material. Final cleaning shall include:
    1. Cleaning and polishing of glass; porcelain, enamel and finish metals; washroom accessories.
    2. Vacuum cleaning of ceilings, walls and floors.
    3. Cleaning of floors and waxing of all waxed floors.

4. Cleaning of glazed wall surfaces.
5. Cleaning of hardware, mechanical fixtures, lighting fixtures, cover plates, and equipment, including polishing of their finish metal, porcelain, vitreous, and glass components.
6. Removing of visible labels and temporary protection coverings left on materials, components and equipment.
7. Cleaning of masonry and concrete, if so directed by the Architect.
8. Cleaning of wood panelling, millwork and doors.

8. Final Inspection and Closeout

1. Submit proposed closeout procedures and schedule of inspection to Architect for approval before final inspections commence.
2. Arrange for, conduct and document final inspections, closeout and take-over at completion of work of this specification in accordance with procedures described in OAA/OGCA TAKE-OVER PROCEDURES, OAA/OCGA Document No. 100, December, 2007.
3. Substantial completion cannot be applied for until the building is approved for occupancy by the local Building Authority, maintenance manuals and as-builts have been submitted, operating instructions to the Client have been completed and percentage of completion as per the Construction Lien Act has been obtained.
4. Comply with Section 01700.

**14. TRADEMARKS AND LABELS**

1. Trademarks and labels shall not be visible in the finished work except for labels of ULC and other similar authorities and except where necessary to identify mechanical and electrical equipment, for maintenance and replacement and except where specified otherwise.
2. Except as provided in the foregoing paragraph, locate trademarks and labels on concealed or inconspicuous surfaces or remove by grinding if necessary or paint out where surface painted, if located conspicuously.

**15. BURIED SERVICES**

1. The Contractor shall be responsible for keeping records of all buried services. The subcontractors concerned shall provide the Contractor with all necessary dimensions required to accurately locate those services.

**16. EXISTING SERVICES**

1. Where work involves breaking into or connecting existing services, carry out work

- at times directed by governing authorities, with minimum of disturbance to the operation of the facility, pedestrian and vehicular traffic.
2. Before commencing work, establish location and extent of service lines in area of work and notify Architect of findings.
  3. Where unknown services are encountered, immediately advise Architect and confirm findings in writing.
  4. Provide adequate bridging over trenches which cross sidewalks or roads to permit normal traffic.
  5. Remove abandoned service lines to distance of six feet from foundations. Cap or otherwise seal lines at cut-off points, in manner approved by authorities having jurisdiction over service.
  6. Record locations of maintained, re-routed and abandoned service lines. The sub-contractors concerned shall provide the General Contractor with all necessary dimensions required to accurately locate those services.
  7. The appropriate Sub-contractor shall assume full responsibility for the locations and protection of all under and above ground utilities, such as water, sewer and gas mains and building connections, hydro and telephone poles, wires and conduits, etc. when excavating or digging below grade whether they are shown on the plans or not.
  8. Where the location of any of these utilities has been shown on the plans, such information is not guaranteed. It is the appropriate Sub-contractor's responsibility to verify locations, invert elevations, etc., immediately after moving on the site. If for any reason the information obtained necessitates changes in procedures or design, advise the Architect at once. If this verification of existing conditions is not done at the outset and any problems arise, the responsibility for same will be entirely the Contractor's.
  9. Contractor to provide temporary support of existing service lines and pipes where work requires excavation below existing lines for construction of new footings, foundations, etc.

**17. EMBEDDED CONDUIT, PIPE AND SLEEVES**

1. Concrete Slabs
  1. All pipes and conduits shall be depressed to pass under concrete slabs on grade.
  2. Sleeves, conduits and pipes which pass through suspended slabs, beams or walls, shall be in approved locations which do not impair the strength of the construction. Space them all not less than three diameters o.c.

**18. SOUND ATTENUATING PARTITIONS**

1. Avoid "short circuiting" sound attenuating partitions by the careful location and treatment of ducts, grilles, diffusers, etc., and of electrical outlets and boxes, etc. Where electrical boxes are back to back, serving each side, locate them at least 10 inches (250 mm) apart laterally and if interconnected, use flexible connections.

**19. SAFETY**

1. The General Contractor will be responsible for submitting their safety program used in the ongoing operation of their company and any safety recommendations specifically relating to the tendered project.
2. Safety measures or procedures taken by the General Contractor i.e. site safety meetings, site construction fences, etc., will not relieve the Contractor of their responsibilities for the safety of persons and property, and for compliance with the federal, provincial and local statutes, rules, regulations and orders applicable to the conduct of the work.
3. Submit copies of all Safety Meeting Minutes to Architect and Client.
4. Comply with Section 01545.

**21. OMISSIONS AND DISCREPANCIES**

1. Notify Architect at once of discrepancies found in, or omissions from the drawings, specifications or other documents or if in doubt as to their meaning; Architect will send a written instruction to all Bidders. If a discrepancy exists, the Architect will issue an addendum to all Bidders to clarify or correct such discrepancies.
2. Neither Client nor Architect will be responsible for any verbal instructions.
3. Should any discrepancies or omissions go unreported to the Architect during tendering period, the proper interpretation shall be at the discretion of the Architect.

**22. SITE**

1. The work to be done at 460 Sunset Drive, St. Thomas, Ontario.

**23. EXAMINATION**

1. The sites shall be accepted by the Contractor in their present condition. The Contractor will be held to have visited each site and to have carefully examined all conditions affecting each site, the work to be done there on, including the location of all services which may have to be protected, removed or relocated. The Contractor shall accept sole responsibility for any error or neglect on their part in this respect. Submission of Tender shall be deemed confirmation that tenderer has inspected site and is thoroughly conversant with existing conditions. No claims for extra payment will be considered for extra work, expense or difficulties encountered due to conditions on each site which were visible upon or reasonably inferable from an examination of the said site prior to the closing of

tenders.

2. Examine the specifications, drawings and soils report thoroughly. Report to Architect all ambiguities, discrepancies, omissions, errors, departures from Building By Laws, or from good practice, discovered during examination as early in the tender period as possible to allow clarification by addenda to be issued to all bidders. No claims for extra payment will be considered for work, expense or difficulties which are reasonably inferable from an examination of the documents prior to the closing of tenders.
3. The drawings and specifications complement each other and neither is to be considered alone. Hence, any item omitted in one, but mentioned or implied in the other, must be provided.
4. All changes to the contract documents which result in an extra or a credit to the contract amount are not to be executed until written instructions have been received and the extra or credit agreed to in writing by all parties to the contract.
5. The Contractor shall execute variations, alterations and substitutions which do not affect the contract amount as instructed by the Owner or its representatives.
6. Bidders finding discrepancies or omissions in the drawings or specifications shall at once notify the Architect who shall send written instructions to all bidders. Bidders may, during the tender period, be advised by addenda of any additions, alterations or deletions to the specifications and drawings. All such changes shall be covered by the tender and become part of the contract documents.
7. If any person submitting a bid on this project is in doubt as to the true meaning and intent of any part of the specifications or other documents, he must request an interpretation from the Architect. If such interpretation is not requested, the bids will be presumed to be based on the interpretation or directions that may be subsequently given by the Architect after award of the Contract, in accordance with the provisions of the Contract.
8. Prior to the closing date of tenders, any and all necessary clarifications of the specifications or other Tender documents will be in the form of written Addenda. The Architect will NOT be responsible for verbal instructions or any explanations or interpretation of Drawings and Specifications.
9. No questions concerning this project will be accepted by the Architect during the day of the tender closing date for 48 hours prior to the tender closing date.

#### **24. UNIT PRICES**

1. At time of submission include in the tender form all the unit prices in accordance with the Tender Form. These unit prices will be included in the agreement.
2. Unit prices shall include labour, material, overhead and profit, supervision, and other relative charges, but shall be exclusive of all value added taxes, and HST. Any work done on the basis of unit prices shall be carried out generally in

accordance with the specifications for similar work and shall be to the Architect's approval.

3. The Client reserves the right to accept or reject any or all of the Unit Prices proposed prior to entering in the construction contract. The Client reserves the right to negotiate these unit prices rejected or proposed

**25. PROCEDURES AND SUPPLY OF CRITICAL MATERIALS**

1. Submission of a tender shall constitute the Tenderer's agreement that they will commence work immediately upon award of the Contract, and that they will execute the same without interruption until completion, including the furnishing of all necessary supplies and equipment for winter operations. Contractor shall assure themselves before submitting a tender that they are in a position to furnish adequate supplies of all materials, critical or otherwise, at such times necessary to ensure immediate commencement of the work and continuous operation without delays on the project. The Contractor shall include in their tender amount, sufficient sums for the purchase of critical materials from any source available. After award of the contract, the Client will not grant increases to the tender amount to obtain critical materials at premium prices, nor will delays or interruption of the work be tolerated.

**26. LAWS, CODES AND REGULATIONS**

1. The tenderer is assumed to have made themselves familiar with and abide by the Federal National Authorities, Provincial, Municipal and local laws, rules and regulations which in any manner affect those engaged or employed in the work, or in any way affect the work, and no plea of misunderstanding will be considered on account of ignorance thereof. If the Bidder shall discover any provisions in the drawings, specifications or contract which are contrary to or inconsistent with any law, rule of regulation, Contractor shall at once report it to the architect in writing.

**27. WAGES**

1. The General Contractor and all subcontractors shall adhere to the hours of work, the working conditions and rate of wages paid under the prevailing local conditions and/or requirements, paying not less than minimum wages established by customary standard in the locality for the same or similar class of work.

**28. SITE ACCESS**

1. Contractor to remove all debris from site daily.
2. Location of all trailers, storage units, and construction fences by contractor shall be reviewed and approved by the Client and Architect at a preliminary site meeting prior to contractor moving on to site.
3. Parking for construction workers shall be on site as directed by the General Contractor, only when parking spaces are available.
4. Site access for construction to be confirmed at first site meeting.

**29. CONSTRUCTION SAFETY**

1. Safety measures or procedures taken by the Contractor, i.e. site safety meetings, protective street hoarding, site construction fences, etc. will not relieve the contractor of their responsibilities for the safety of persons and property, and for compliance with the federal, provincial and local statues, rules, regulations and orders applicable to the conduct of the work.
2. This Contractor shall be liable for any costs, fines, penalties, etc. levelled against the Client or Consultant due to violation of the Construction Safety Act by this Contractor or any Subcontractors on this project.
3. This Contractor will be responsible for submitting to the Client their safety program used in ongoing operation of their company and any safety recommendations specifically relating to the tendered project.

**30. PROJECT SCHEDULE**

1. The successful bidder will be required within one (1) week after award of a Letter of Intent to forward to the Architect, a schedule indicating construction sequences, manpower and equipment required in order to complete the work. This schedule is to be posted on site at all times. Schedule is to be updated on a weekly basis.
2. When the Architect deems that the Contractor's work has fallen behind schedule, the contractor will provide the necessary manpower and work the necessary overtime to bring the work back on schedule at no cost to the Client.
3. Contractor shall commence shop drawings immediately once acceptance of tender has been given by the Client. A complete shop drawing and sample submission schedule is to be provided within seven days of tender award. This will be reviewed by Architect.
4. Commence construction on the Project as soon as Building Permit is obtained. It is a mandatory requirement that this project (complete scope of work) be substantially complete by August 2019 and ready for the Client's occupancy by September 2019.

**31. PROTECTION AND MAKING GOOD**

1. Protect existing property, adjacent public and private property and work of other sections from damage while doing work.
2. Damaged work and property shall be made good wherever possible by those performing work originally, but at expense of those causing damage. The General Contractor is solely responsible for all subtrades and any damage.
3. Attach and fasten fixtures and fittings in place in safe, sturdy secure manner so that they cannot work loose or fall or shift out of position during occupancy of building as a result of vibration or other causes in normal use of building.

4. If, during performance of the work, any buildings, curbs, walks, roads or landscaping are damaged, repair or replace them to the satisfaction of Architect and the local jurisdiction at no additional cost to the Client.

**32. MATERIALS AND EQUIPMENT**

1. All materials and equipment supplied for the work shall be new, of the best quality, and in accordance with the latest applicable specifications of the Canadian Standards Association.
2. The particular method, material, procedure or equipment specified in this tender shall be used as a standard.
3. M.S.P.S. (Material Safety Data Sheets) for all materials being used on this project are to be kept on site and made available for use by all concerned.
4. Controlled substances: the use of any controlled substance of any kind must be reviewed by Client and written acceptance of its use obtained.
5. A bidder may submit an alternative method, material, procedure or equipment to that specified in the tender specifications. All alternatives shall be equal or superior to the standard specified in these tender documents and all unit prices along with overall product quantity cost is to be submitted. Alternates may not necessarily be accepted by the Architect.

Where particular products are specified and approved alternate manufacturers are listed, it is the responsibility of the contractor to ensure that any products carried in their tender from one of the approved manufacturer's meets or exceeds the original specified product.

Upon the alternate product shop drawing submission to the architect for review, all product data sheets (for specified and alternates) comparing the two products are to be submitted.

6. The bidder who furnishes an alternative method, material, procedure or equipment in place of the standard item specified shall furnish complete documented data including such information as chemical content and performance under laboratory tests which proves the quality and equality of the proposed alternative. This information shall accompany the bid. Note that the bidder who furnishes an alternative method, material, procedure or equipment in place of the standard item specified is responsible that the alternative will work with the Architectural layout, equipment will fit in the provided space and any revisions that will be required will be at the bidder's cost.
7. In all cases where alternative methods, materials, procedures or equipment are offered in response to this tender, the Owner shall make the final ruling on their acceptability.
8. During and upon completion of the work, the Contractor shall remove from the premises all surplus materials, equipment and debris.

**33. ACCESS TO INFORMATION**

1. All tenders, quotes and proposals are subject to the Municipal Freedom of Information and Protection of Privacy Act and will be disclosed where the Owner is required to do so for the purposes of complying with an Order of the Information and Privacy Commissioner.

**34. GENERAL NOTES TO CONTRACTOR**

1. The contractor will be required to keep and maintain a set of as-built drawings for each project. These drawings will be used for no other purpose than recording the exact location of buried or covered services and all changes to the contract documents. The as-built drawings will be submitted to the Architect along with guarantees, maintenance data, extra supplies, etc. at the substantial performance of the contract.
2. The contractor will turn over to the Architect at the completion of the contract all **project close out documents, as-built drawings, material, etc.** These documents, material, etc. including occupancy permit, will be accepted only with a transmittal and at no other time than when submitting a written request for substantial performance of the contract. For purposes of determining a value of this work it will be considered as **\$10,000.**
3. The contractor is not to act on verbal instruction from the Client, Consultants, or Architect on work they consider to be extra to their contract scope. Extra work can only be authorized by the Architect and in a written form only. The written form must also include that this work is an extra to the contract scope, and the method by which extra costs will be tabulated.
4. Ensure the building is maintained weather tight, safe and secure. Furnish all temporary protection as may be required.
5. Remove and dispose of all resultant debris.
6. Work shall be done in accordance with best standard practice, unless special methods or performance standards are specified or given in writing by the Client. Only skilled mechanics shall be used where such are required to produce a first class job. Where required by code or other by-laws and regulations, trades people shall be licensed in their trades.
7. Use, install and handle manufactured materials in accordance with manufacturer's instructions.
8. Conform to the latest Ontario Building Code, CEC CSA C22, (latest Edition as currently amended) CAN3-B44, and CSA W59.1, where applicable, to the Canadian Code for Construction Safety, as currently amended, and to the Construction Safety Act, Ont. as currently amended, and to all other applicable codes and Building By-Laws hereinafter referred to as Codes; and to the requirements of the authorities having jurisdiction, including public utilities, referred

to in the Contract Documents as the authorities.

9. Conform to regulations of Municipality having jurisdiction regarding clean-up of tracking on streets and protection of sidewalks and curbs, and all other applicable laws, By-laws and Regulations.
10. Any work not acceptable to the Architect or Client or local authorities shall be removed and replaced when and as directed by them. The cost of re-executing such work shall be borne by the Contractor.
11. All mechanical maintenance pads and penetrations to be by Division 15, and all electrical maintenance pads and penetrations to be by Division 16.
12. The contractor shall have internet service on the jobsite for transfer of documents and drawings and shall maintain this service until the date of substantial performance of the contract.
13. The contractor shall maintain access to the buildings and portable buildings on site and shall restrict access to construction areas.
14. The contractor shall provide temporary drainage as required at construction access points to prevent the build-up of dirt and mud and the migration of this onto municipal streets. Periodic cleaning of municipal streets is to be provided when required and whenever specifically requested by the municipality.

**END OF SECTION**

1. EXAMINATION

1. Throughout the project, examine the work of all trades and promptly notify the Architect if any conditions do not or will not comply with the drawings and specifications.

2. SETTING OUT

1. Lay out work from control bench marks and indicated verified reference points. The General Contractor shall have a qualified land surveyor, registered to practice in Province of Ontario and approved by Architect, verify accuracy of layout and certify that building foundations and finish grade levels and locations are in accordance with the contract documents. File certification with Building Department and Architect immediately after foundations are completed. Payment for the Land Surveyor will be carried out by the General Contractor not under the Cash Allowance.
2. The Land Surveyor shall provide four lines and one benchmark for the General Contractor to layout their work to. The General Contractor will provide these layout lines and benchmarks for work on all other areas once they begin work on the site.
3. Protect and preserve bench marks and reference points. Inform Consultant immediately if bench marks or reference points are disturbed or damaged by any work and pay for their repair and/or replacement.
4. Locate and fix grid lines and locations of walls, partitions, shafts and all parts of the construction as work proceeds.
5. Verify grades, lines, levels and dimensions indicated, particularly with road and sidewalk elevation, and report any errors or inconsistencies to the Architect before commencing work. Confirm job dimensions at once to allow prompt checking of shop and other drawings.
6. As work progresses, provide and maintain bench marks at each floor, giving exact elevation of finished floor.

3. PROTECTION

1. Conform to Ontario Building Code, latest amendments, and The Construction Health and Safety Act, all as currently amended.
2. Provide spare safety helmets for and enforce their use by Owner, Architect, their representatives and any authorized visitors to site.
3. Protect excavation, trenches, and buildings from damage by rain, water, ground water, backing up of drains or sewers and other water, frost and all other weather conditions. Do not allow footings or slabs to be placed on frozen ground. Do not permit excavations to reach full depth indicated when freezing temperature may be expected unless footings or slabs can be placed immediately after excavation has been completed. Protect excavations from frost by placing of suitable approved insulating material to adequate depth, if placing of concrete is delayed and after placing of concrete until backfilling occurs or freezing conditions terminate. Provide necessary pumps (including spare pumps) and temporary

drainage for keeping project free of water throughout construction period. Pump water to public sewers or ditches by approved means. Refer to soils report for details. Control grading around excavations to prevent surface water from draining into excavation and from damaging adjoining property.

4. Protect building from movement and damage, especially during filling and compaction and until elements are securely anchored and cannot be damaged or moved by filling or compaction. Obtain approval of authorities having jurisdiction for such work and make changes as required by them.
5. Provide temporary 6'-0" (1800 mm) high chain link fences complete with steel tubular top rail supports and steel posts, with chain link gates and locks, (conforming to Section 02711 Fencing), to enclose construction area, and pavement protection as required for protection of public, and of public and private property and as required by law and by authorities having jurisdiction. Erect sturdy railings around shafts, stair wells and the like to protect workers and public from injury. Equip foregoing protection with warning lights and signs. Alter, remove and relocate or replace hoardings, barriers, and entrances therein as required by authorities having jurisdiction and by the work. Hazards requiring such protection shall be eliminated as soon as possible and protection devices removed. Maintain fences, gates until construction is complete. Keep free from unauthorized signs.
6. Provide wood hoarding protection as indicated on drawings and in conformance with the local authority having jurisdiction along all streets where new construction is within 6 metres of the street sidewalk.
7. Provide and maintain in working order, adequate, temporary Canadian Underwriters labelled, chemical solution (soda acid) Class A.1, fire extinguishers and locate in prominent positions to approval of authorities having jurisdiction.
8. Utilities and Services - Before starting the work contact the Public Utilities for location of underground services.

#### 4. AS BUILT DRAWINGS

1. Maintain as work progresses, accurate records of changes to the Drawings and concealed services. Accurate locations, depth, size, and type of underground utilities shall be included in these as built drawings. The General Contractor will be supplied with digital drawings in AutoCad®, 2012 or later and PDF format of the floor plans for making these recordings. As built drawings will be reviewed at each site meeting and must be properly maintained to receive Architect's approval before the monthly certificate draw will be approved.
2. Keep a daily record showing progress of the work and all factors affecting the work, i.e., weather, strikes, accidents, shipping delay, etc.
3. The General Contractor shall also supply as built drawings on computer disks in AutoCad 2012 (or later) by a professional drafting service. Approval shall be obtained by the Architect for approval of the professional drafting service.
4. Completed as built drawings and instruction and warranty manuals shall be submitted prior to requesting substantial completion.

5. FIELD OFFICE

1. Field Office: General Contractor to provide field office at site for Contractor's and Consultants' use. Provide janitor service for periodic dusting, cleaning, and removal of rubbish. Include construction and operating hardware, with security locks, as required. Coordinate on site office in existing building where directed by Owner.
2. Storage Area: General Contractor to provide storage area at site for products and tools. Include construction and operating hardware, with security locks, as required. Separate storage for painter's materials and tools from other storage areas. Locate storage area where directed by Architect and provide security.

6. WASHROOM CONVENIENCES

1. General Contractor to utilise existing washroom facilities as per the Construction Health and Safety Act for use of subcontractors and employees. Owner to direct which Facilities are to be used. Employees on work must avail themselves of this convenience. General Contractor to clean and maintain these facilities on a daily basis.

7. TEMPORARY TELEPHONE AND FACSIMILE

1. The General Contractor shall provide and pay for a private telephone and facsimile until their work is complete.

8. TEMPORARY SERVICE ROADS

1. The Contractor shall construct and maintain in good condition, such temporary service roads, culverts that may be necessary to provide safe, convenient and adequate access for materials, and other supplies at all times while the General Contractor is working on site, all to the approval of the Architect. NOTE: The Contractor shall protect existing roads, sidewalks, curbs and provide mud mats to the satisfaction of the Local Authorities and replace any that become damaged due to any operations under this contract.

9. STORAGE SHED

1. Provide and erect where directed, weathertight shed of suitable size. Contractors and subcontractors shall provide their own workshops and storage sheds for entire length of construction. At no time may existing buildings or new additions be used for storage of materials.

10. DELIVERY AND STORAGE OF MATERIALS

1. Arrange for early deliveries necessary for execution of work without delay and have materials on job well in advance of the time it is needed.
2. Deliver, store and handle materials to exclude foreign material and prevent damage, soiling or breakage.
3. Materials to be stored on site, which need to be protected from weather shall be so protected.
4. Packaged materials shall be delivered in packages with manufacturer's seals and

all labels intact.

11. BUILDING AND PREMISES

1. Owner reserves right to take over any completed portion prior to specified completion date, provided it does not affect completion of remaining work.
2. If Owner is forced to occupy building or parts thereof prior to completion, but after date of Substantial Performance, Contractor shall not be entitled to indemnity for interference with the performance of the work.

12. OWNERSHIP OF MATERIALS

1. All work or material delivered on the site or premises to form part of the works shall be considered the property of the Owner and shall not be removed without the consent of the Architect, but the Contractor shall have the right to and shall remove the surplus materials after he has completed the work. If so directed by the Architect, such surplus materials shall be removed at any time prior to the completion of the work.
2. All materials which are to be removed from the existing site and are not called for to be re-used or specifically called for in the specifications to be turned over to the Owner, shall become the property of the General Contractor and shall be removed from the site.

13. DETAILS AND MEASUREMENTS

1. Ensure that necessary job dimensions are taken and trades are coordinated for the proper execution of the work. Assume complete responsibility for the accuracy and completeness of such dimensions, and for co-ordination.
2. Verify that work, as it proceeds, is executed in accordance with dimensions and positions indicated which maintain levels and clearances to adjacent work, as set out by requirements of the drawings, and ensure that work installed in error is rectified before construction continues.
3. Check and verify dimensions referring to work and interfacing of services. Dimensions, when pertaining to work of other trades, shall be verified with trade concerned.
4. Do not scale directly from the drawings. If there is ambiguity or lack of information, immediately inform the Consultant and await his instructions before proceeding. Be fully responsible for rectifying, altering or redoing any work resulting from disregarding this clause.
5. All details and measurements of any work which is to fit or to conform with work installed shall be taken at the site.
6. Should revised drawings be issued after work has commenced, Contractor shall immediately return to Architect previous drawings which refer to said work. The Contractor will be held responsible for work being carried out in accordance with said revised drawings.

14. WORKMANSHIP

1. Work shall be done in accordance with best standard practice. Only skilled mechanics shall be used where such are required to produce a first class job.
2. Use, install and handle manufactured materials, equipment and appliances in strict accordance with manufacturer's directions and instructions, unless specified otherwise.

15. FROST PROTECTION

1. Provide proper frost protection, including heating for materials to ensure scheduling of work without delay.
2. Similar protection shall be given to work done.
3. Work or materials damaged by frost shall be replaced by Contractor.
4. Snow and ice shall not be allowed to remain on any part of structure, except finished roofs, and shall be removed by Contractor.

16. PROJECT MEETINGS

1. Arrange regular meetings at two week intervals and notify the representatives of the Owner, Architect, Engineer and each subcontractor concerned with the current progress.
2. Contact all subcontractors concerned at least 24 hours in advance and request their presence at job meeting.
3. Review approved progress schedule for rapid and efficient completion of work according to Contract requirements, with suppliers of materials and subcontractors.
4. Post and forward copies of progress schedule for advice of interested parties.
5. Record the minutes of each meeting and send copies to all attending and interested parties not later than two days after the meeting. In addition, send copies to the Architect, Consultants and Owner. Contractor to provide updated change order register and shop drawing register attached to each record of minutes to indicate exactly what has been issued and the status of approvals and/or distribution.
6. Keep Architect informed of progress, delays and of potential delays during all stages of work to avoid delays.

17. BROKEN GLASS

1. Replace all broken, damaged or scratched glass and mirrors. Glass which has been broken, scratched or damaged in installation shall be replaced by installer.

18. PROGRESS SCHEDULE

1. Further to GC.2 of the General Conditions of the Contract, carefully prepare full progress schedules of the work in form to be mutually agreed upon by Contractor and Architect.

2. Prepare schedule immediately upon award of Contract and present three (3) copies to the Architect within a maximum of one week from Contract awarding date.

19. MAINTENANCE MANUALS

1. As soon as possible and in no event later than request for substantial completion check and assemble in three ring binder, all shop drawings, all warranties and guarantees submitted by manufacturers, suppliers and subcontractors and as called for throughout Specifications. Assemble three copies of recommended operation and maintenance procedures (such as flooring, equipment, roofing). Present three matching binders to Architect for submission to Owner. Furnish a complete index in each binder listing its contents in detail and stamp and sign the cover page of each and every manual. Also ensure that the manuals are stamped and signed on the cover page by subcontractor submitting them.
2. Recommended maintenance procedures shall contain warnings concerning the use of maintenance materials or practices which might injure the product covered by the recommended maintenance procedure. Should any product be injured or damaged by faulty maintenance or practices not warned against in the maintenance manual, then the Contractor shall rectify such damage or injury.
3. Complete maintenance manuals shall be submitted prior to requesting release of Holdback.

20. FIRE PROTECTION AND ACCESS TO EQUIPMENT AND EXITS

1. Take necessary precautions to eliminate fire hazards and to prevent damage to work, equipment and other property both public and private having to do with the work. Inspect work of this contract at least once a week for this purpose.
2. Provide and maintain in working order suitable Underwriters' labelled fire extinguishers and locate in prominent positions, to approval of authorities.
3. When welding, brazing and performing any operation with an open flame, a portable fire extinguisher shall be kept within 10 feet (3000 mm) of the operator at all times.
4. Store and locate materials and equipment packed in cardboard cartons, wood crates and other combustible containers in orderly and accessible manner. Place approved types of firefighting equipment in vicinity of materials or equipment packed in this type of crate or carton until permanent fire protection and equipment are available.
5. Store all rags and waste containing oil, grease or other flammable materials in an approved metal container and remove from the site at the end of each working day.
6. Only fire resistant tarpaulins are permitted on site.
7. Locate temporary buildings and storage areas in relation to their hazards and probability of damage to existing buildings under construction. Unless

constructed of non-combustible materials, wherever possible locate them at least 33 feet (10 m) away from buildings. If constructed of combustible materials separate these structures into small detached units.

8. Provide and maintain free access at all times from the street to fire hydrants and to outside connections for standpipes or other fire extinguishing equipment whether permanent or temporary. Do not place material or construction equipment within 10 feet (3 m) of hydrants or connection, nor between them and centre line of the street.

Maintain free access at all times to control valves and hose on fire lines within building and to all portable extinguishers.

9. Install fire doors and put into operating condition at the earliest possible time.
10. Comply with requirements of 01545 Safety Requirements.

21. SAFETY

1. Take all precautions necessary to protect and safeguard workers from dangerous conditions including fumes; lead paints, etc.; asbestos; and silica hazardous to health.
2. Comply with requirements of 01545 Safety Requirements.

22. ADJACENT BUILDING

1. Particular attention shall be paid to prevention of fire and elimination of fire hazards which would endanger new work or existing property.
2. No existing footings, foundations, pipe lines, electrical conduit and wiring shall be undermined or otherwise damaged or endangered by digging, butting of any other operation in the performance of the work of this Contract. Any existing work so affected shall be immediately repaired and made good to the Architect's satisfaction at the Contractor's expense.
3. Active services to the adjacent buildings shall be protected.
4. In case of damage to active services, notify Architect, Utilities and Authorities immediately and make all required repairs under direction of appropriate utility. Carry out repairs during off hours if required.

23. NOTES TO GENERAL CONTRACTOR

1. Ensure that the building is maintained weathertight and secure. The General Contractor shall furnish all temporary protection, enclosures, tarpaulins, etc., as may be required to weatherproof openings in the work.
2. Demolish and clean up all existing trees, scrub and debris and any other items found on the site not indicated to remain.
3. The General Contractor shall carry out all removal and disposal of all resultant debris.

4. In case of damage to active services, notify Architect, Utilities and authorities immediately and make all required repairs under direction of appropriate utility. Carry out repairs during off hours if required. In absence of specific requirements or direction, plug or cap unused or abandoned utility lines at least 3 feet (1000 mm) outside of new building walls, or as required by utilities, codes and authorities.
5. The location of construction shacks and trailers to be approved by the Architect and Owner.
6. Take all precautions necessary to protect and safeguard workers from dangerous conditions including fumes, lead and silica products that may be present during the construction that are hazardous to health.
7. Restore disturbed areas to original condition unless shown otherwise on drawings or stated in specifications.

24. PROTECTIVE FENCING

1. The Contractor shall install and maintain temporary 6'-0" (1800 mm) high chain link fence complete with steel tubular rail top supports and steel posts and gates conforming to Section 02711 Fencing to fence off construction access and construction areas as directed by the Architect and as required to conform to the authorities having jurisdiction. The installation of temporary fences shall be to provide the least disruption and to meet the approval of the Owner.

25. CONSTRUCTION PARKING

1. Parking will be permitted on site provided it does not disrupt the performance of Work.

26. PROTECTION FOR OFF-SITE & PUBLIC PROPERTY

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

27. SIGN AND ADVERTISEMENTS

1. Erect no other signs, except those signs which are necessary to give direction or for safety, or warning signs, without the Architect's permission. Where other signs are required or wanted, obtain Architect's approval.

28. PROTECTION OF BUILDING FINISHES & EQUIPMENT

1. Provide protection for finished and partially finished building finishes and equipment during performance of work.
2. Provide necessary screens, covers, hoardings as required.
3. Be responsible for damage incurred due to lack of or improper protection. Replace or repair finishes or equipment so damaged.

29. SECURITY

1. When work at site has progressed as to become attractive for vandalism or theft, engage a recognized security guard agency to provide security service at times when tradesmen are not present in substantial numbers. Continue service until after time of Substantial Performance and the Owner has occupied the building.
2. Extent of security services shall be at the discretion of the Contractor. Note that the fit, finish and new appearance of the finished building will not be comprised. Materials, products, finishes, etc. damaged due to vandalism are to be restored and/or replaced to an as-new condition.

**End of Section**

NOTE: Where a product is named in the Specifications by one of the following names or by any name followed by the number of one of the following articles, the product shall conform to the standard named in the corresponding article, except as specified or indicated otherwise.

1. METALS

1. Aluminum (A1)

1. Bar, rod, wire, extruded shapes; architectural: CSA HA. Series (AA/AnS1 6063) (Alcan 50S) condition T5.
2. Bar, rod, wire, extruded shapes; Structural: CSA HA Series (AA/ANS1 6061) (Alcan 65S) Condition T6.
3. Plate, sheet, coil; utility: CSA HA Series Alloy MC10, (AA/ANS1 3003) (Alcan D3S); condition H14 (sheet, coil), F (plate).
4. Plate, sheet, coil; anodizing: CSA HA Series Alloy 990C, (AA/ANS1 1100) (Alcan D2S); condition H14.
5. Specially anodized aluminum (hard anodized): (AA-M21 or M12C22A42) conform to Finishes, Aluminum, Hard Anodized (FA.HA) attached to Section 01016.
6. Painted aluminum: conform to Finishes, Aluminum, Baked on Coatings FABC attached to Section 01016.
7. Anodized Aluminum: AA-M21 or M12C22A31.
8. Aluminum for elevated floor plates: (Bruce EDP) US Fed. Spec. QQ-A-591c, Ty A380 (mil-HDBK-H1C code 20087).
9. Aluminum sand casting: (signs, etc.) AA 443.0.

2. Sheet Gauges

1. Gauges and equivalent thicknesses of sheet, plate, coil and strip shall conform to the table of gauges and equivalent thicknesses (GET) attached to Section 01016. See 1.3.4 and 1.3.6 special application of gauges to structural sheet.

3. Galvanized Sheet Steel

1. ASTM A525 and 526, commercial quality sheets, plain commercial galvanized, stretcher levelled or temper rolled to stretcher levelled standard of flatness if specified.
2. Same as 1.3.1 except wipe coated instead of plain commercial galvanized.

3. Same as 1.3.1 except mill phosphatized instead of plain commercial.
  4. ASTM A446 structural quality, Grades A or B, max. permissible working stress: Grade A, 20,000 psi; Grade B, 22,400 psi. plain commercial galvanized. Gauges shall apply to core sheet and shall be msg. Coating thickness shall be added to core thickness to determine thickness of coated sheet (see 1.2.1).
  5. Same as 1.3.4 except wiped coated instead of plain commercial, with a coating not less than .050 oz. per sq. ft. (see 1.1.4).
  6. Same as 1.3.4 except wiped coated instead of plain commercial galvanized (see 1.2.1).
  7. Preparation for painting, in ship, ASTM D2092-68.
4. Copper Metals
1. Nickel Silver (white bronze): Anaconda American Brass Alloy 796 (leaded nickel silver) (has higher zinc content than any of the nickel silvers in ASTM B122-71a):

Copper	45%
Zinc	42%
Nickel	10%
Lead	1%
Manganese	2%
  1. Sheet copper and strip copper for roofing, flashing and building construction: ASTM B370, cold rolled temper, 16 oz. or as specified otherwise.
  2. Monel: (nickel 63-70%, approx. 5% other metals, remainder copper) plate, sheet, strip, hot rolled, annealed and pickled, ASTM B127; (Inco Monel 400).
  3. All applicable copper metals: ASTM B248.
  4. Architectural Bronze (Red Brass), ASTM B36, No. 3 (85% CU + 15% NI).
2. Stainless Steel
1. Plate, sheet and strip: CSA G110.6-1968, Type 302 or 304 as specified, or as specified otherwise; finish: No. 4 unless specified otherwise.
  2. Structural shapes and bars, CSA G110, 4-1968, Type 302, 304 or 316 as specified; No. 4 finish unless specified otherwise.
3. Sheet Steel

1. Sheets, cold-rolled carbon steel, commercial quality, ASTM A366 stretcher levelled or temper rolled to stretcher levelled standard of flatness if specified.
2. Porcelain enamelling steel, ASTM A424, Commercial Quality, Type 1 or 2.
3. Same as 1.6.1 except special quality for electro deposited coatings.
4. Same as 1.3.4. except un-galvanized.
5. Hot-rolled, carbon steel sheets and strip, structural quality ASTM A570-70, 5 grades (stair treads, risers, etc.).
6. Hot-rolled carbon steel sheet and strip, commercial quality ASTM A569-66T.
7. Prepainted:
  1. CSSB1 Technical Bulletin No. 5, as currently amended (modified silicone alkyd, 2000).
  2. CSSB1 Technical Bulletin No. 5, as currently amended, except humidity resistance 5000 hours; salt spray resistance 400 hours; resistance to accelerated weathering 2500 hours (fluoropolymer, 10,000).
  3. CSSB1 Technical Bulletin No. 5, as currently amended, except humidity resistance 3000 hours (silicone alkyd, 5000).
4. Sheet Steel (Cold Rolled)/Structural Steel (Hot Rolled)
  1. When steel thickness is indicated by gauge or by decimal fractions of inches, it is sheet steel (1.6) or galvanized sheet steel (1.3) or stainless steel (1.5). When steel thickness is indicated by common fractions of inches, it is structural steel (1.8). However, some sheet steels are structural quality, (i.e. having guaranteed strength).
5. Structural Steel
  1. CAN/CSA G40.21-M87, 38W or 44.
6. Soldering Materials
  1. Solder: Solder for Div. 15 to conform to Div. 15 specifications. Under no circumstances shall any lead containing solder be used on any potable water piping systems throughout the project.
  2. Flux: on stainless steel:

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1. Muriatic acid killed by the addition of zinc until all effervescence stops and no excess of zinc remains; improved by the addition of a small amount of ammonium chloride, plus 10% acetic acid; or
  2. muriatic acid: ferric chloride: nitric acid 90:50:3, by weight; or
  3. Approved commercial flux designed especially for use with stainless steel, such as EutecSol 682, or approved equal.
3. Flux: on copper and galvanized steel:
1. killed muriatic acid as specified in 1.9 b.1; or
  2. suitable rosin type.
7. Galvanizing
1. All steel except (1.3), CSA G164 Hot Dip Galvanizing of irregular Shaped Articles. Must be done after all welding complete. No welding of galvanized products allowed.
8. Welding Materials
1. CSA W59, CSA W 55.2; for stainless steel, ASTM A371; for aluminum, ASTM B285.
9. Metal Filler
1. Epoxy: Hysol 6C epoxy adhesive kit (or 4297 in bulk) manufactured by Hysol (Canada) Limited, or approved equal.
10. Plating (Electrodeposited Coatings)
1. Cadmium (on steel): ASTM A165, Type NS (13 mu), OS (7.6 mu), TS (3.8 mu).
  2. Chrome (on steel): ASTM B.456, Fe Ni20b Cr r unless specified otherwise, bright unless dull specified.
  3. Chrome (on copper and copper-base alloys): ASTM B456, Type FC unless KC or QC specified; bright unless dull specified. (In this case FC is thick and QC is thin.)
  4. Weight of zinc coating and thickness to be added to base metal to determine thickness of coated material.

(Source: ASTM A-446, Tables 2 and 4)

Coating Class oz. Per sq. ft.	Triple-Spot Test, Minimum Check Limited oz. per sq. ft.	Thickness in
2.75	2.35	0.0041
2.5	2.1	0.0037
2.25	1.85	0.0033
2	1.65	0.003
1.75	1.4	0.0026
1.5	1.15	0.0022
1.25 commercial	0.9	0.0019
Wipe Coated (Colourbond or Satin coat in Canada only)	0.25	0.0005

**NOTE:** Light Commercial not available in Canada.

1. Paint (See 1.6.7)
  1. Shop primer on steel: CGSB 1-GP-40d.
  2. Bituminous paint: CGSB 1-GP-108c.
  3. Baked enamel on steel: primer, CGSB 1-GP-81e, Type 2; finish CGSB 1-GP-88e, baking alkyd enamel.
  4. Baked enamel on aluminum: FA.BTAE, attached to Section 01016.

**END OF SECTION**

1. CASH ALLOWANCES

1. Comply with requirements of G.C. 4.1 Cash Allowances.
2. Include the following Cash Allowances in the Contract Price. These allowances shall be expended in whole or in part, when authorized by the Architect in writing. The unused portion of the Allowances shall be credited to the Owner.
3. The Contract Price and not the cash allowance, includes the Contractor's overhead and profit in connection with such cash allowance.

No refund of overhead and profit will be expected on any unspent portion of Cash Allowances. Likewise, no overhead and profit will be allowed on total amount by which all Cash Allowances are exceeded.

4. Expend cash allowance as directed by the Consultant in writing. Allowance will be adjusted to actual cost but no adjustment will be made to Contractor's charges including overhead and profit which are included in the Contract Price.
5. Cash allowances are designed for work and services deemed to be necessary by the Owner, from time to time, throughout the execution of the Work. Where a cash allowance refers to an item or category of work already included in the Contract Documents, it shall be assumed to cover work or services in addition to that included, unless specifically indicated otherwise.
6. Contractor may be required from time to time, to assist in tendering of certain items of work or services covered by allowance, as directed by Consultant.

7. Material Supply Items:

1. Scope for material supply items covered by Cash Allowance includes:
  1. Net cost of material.
  2. Applicable taxes and duties.
  3. Delivery to site.
2. In addition to above scope covered by Cash Allowance include in Contract Price costs for:
  1. Handling at site, including unloading, uncrating, storage and hoisting.
  2. Protection from elements, from damage.
  3. Labour, installation and finishing.
  4. Other expenses required to do cash allowance work (i.e. contract co-ordination).
  5. Overhead and Profit.

8. Material and Installation Items:

1. Scope of each material and installation item covered by Cash Allowance includes:
  1. Net cost of material.
  2. Applicable taxes and duties.

3. Delivery to site.
  4. Handling at site, including unloading, uncrating, storage and hoisting.
  5. Labour, installation and finishing.
2. In addition to above scope covered by Cash Allowance include in Contract Price costs for:
  1. Protection from elements, from damage.
  2. Overhead and Profit.
  3. Other expenses required to do cash allowance work (i.e. contract co-ordination).
9. Inspection and Testing Work:
  1. Scope for inspecting and testing covered by Cash Allowance includes:
    1. Net cost of testing laboratory services and field inspection.
    2. In addition to above scope covered by Cash Allowance include in Contract Prices for:
      1. Overhead and Profit.
      2. Supply of material tested, patching and completion of work tested.
      3. Other testing on re-testing work specified in Section 01400.
      4. Other expenses required to do cash allowance work (i.e. contract co-ordination).
10. The following Cash Allowance **to be included** in the Contract Price:  
  
**\$41,500** is to be included in the Base Bid Amount.
11. Progress payments on accounts of work authorized under cash allowances shall be included in the Consultant's monthly certificate for payment. Copies of invoices are to be submitted to substantiate claims.

**END OF SECTION**

1. SHOP DRAWINGS

1. Submit shop drawings electronically in PDF format as per Architect's Contract Administration System Software 01805, in accordance with GC 3.10 of CCDC Document 2, 2020 and as revised in the Supplementary General Conditions, as required in various sections of these specifications and on the drawings.
2. Review submittals prior to submission. This review represents that necessary requirements have been determined and verified, or will be, and that each submittal has been checked and coordinated with requirements of Work and Contract Documents. Submittals not stamped, signed, dated by the General Contractor and identified as to specific project will be returned without being examined and considered rejected.
3. Notify, in writing at time of submission, identifying deviations from requirements of Contract Documents stating reasons for deviations.
4. Verify field measurements and affected adjacent Work are coordinated.
5. Contractor's responsibility for errors and omissions in submission is not relieved by Consultant's review of submittals.
6. Contractor's responsibility for deviations in submission from requirements of Contract Documents is not relieved by Consultant review.
7. Keep one reviewed copy of each submission on site.

2. SAMPLES

1. Submit samples as listed in List of Samples below.
2. Samples of materials, both manufactured and otherwise, proposed for the use on the work shall be submitted to the Architect for approval as required by the Contract Document and/or reasonably required by the Architect. The work shall be in accordance with approved samples. All samples shall be supplied and delivered to the Architect free of charge. The approval of samples shall not be construed as an acceptance of work subsequently carried out.
3. Samples shall be labelled indicating: date of submission, name of project, names of contractor and manufacturer, and complete identification of locations at which materials are to be installed.

3. LIST OF SHOP DRAWINGS

1. Submit Shop Drawings as specified in the following Sections:

<u>Section</u>	<u>Title</u>
03200	Concrete Reinforcement
05500	Miscellaneous Metals

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08110	Hollow Metal Doors, Frames & Screens
08400	Aluminum Entrance Doors
08800	Glass and Glazing
10100	Tackboards
10950	Manufactured Specialties
Division 15	Mechanical
Division 16	Electrical

1. LIST OF SAMPLES

<u>Section</u>	<u>Title</u>
09500	Acoustical Treatment
09900	Painting and Finishing
10100	Tackboards

1. EXTENDED WARRANTIES

In addition to the warranty requirements of GC 12.3 of CCDC Document 2, 2008, and as revised in the Supplementary General Conditions, the Contractor shall note that the following extended warranty periods are required by the Contract Documents for the individual items under respective Sections.

<u>Section</u>	<u>Title</u>
08400	Aluminum Windows Entrance Framing & Doors - 5 years; Glass - 10 years
08800	Glass & Glazing - 5 years
09650	Resilient Flooring – 10 years
10100	Tackboards - 2 years
Division 15	Refer to Division 15
Division 16	Refer to Division 16

1. MAINTENANCE MANUALS

<u>Section</u>	<u>Title</u>
08700	Finishing Hardware
09650	Resilient Flooring
09900	Painting
10100	Tackboards
10950	Manufactured Specialties

Division 15	Mechanical
Division 16	Electrical

1. EXTRA MATERIAL

1. Submit extra material as specified in the following Sections:

<u>Section</u>	<u>Title</u>
09500	Acoustical Tile - 1% of each type
09650	Resilient Flooring - 2% of total of each colours
09900	Painting - See Section
Division 15	All items indicated in Div. 15 sections
Division 16	All items indicated in Div. 16 sections

CERTIFICATE OF PAYMENT APPLICATION FORM

NOTE: HST TO BE INCLUDED IN EACH OF THE FOLLOWING VALUES:

Contractor: \_\_\_\_\_

Application No. \_\_\_\_\_

Work: \_\_\_\_\_

Date: \_\_\_\_\_

Period Covered: \_\_\_\_\_

Description	Contract Amount	% To Date	Value Performed To Date	Value Previously Performed	Value Current Period	Balance to Complete
This Section to show breakdown of Contract such details as:						
General Conditions	\$	\$	\$		\$	\$
Excavation						
Concrete Footings						
Concrete Walls, Cash Allowances, Hardware, etc.						
SUB-TOTAL						
Change Orders No. 1 No. 2 No. 3						
TOTAL CONTRACT						

SUMMARY (HST to be included in all items)

Value of Work Completed to date	\$ _____
Less Holdback of 10%	\$ _____
Holdback Released	\$ _____
Current Holdback (Net Retained)	\$ _____
Sub-Total	\$ _____
Less Previous Certificates	\$ _____
Amount of this Claim	\$ _____
Total of H.S.T. included above	(\$ _____)

GENERAL CONTRACTOR'S H.S.T. NO. \_\_\_\_\_

1. See Individual Specifications Sections for full listing of inspections and approvals.
2. Architect's approvals required:
  1. Architect's and Consultant's approval before interfering with existing services and apparatus. One week notice to be given. Section 01010.
  2. Architect's approval before installing flooring - 01010.
  3. Architect's approval of work schedule (Progress Schedule) - 01310.
  4. Architect's approval of construction signs and locations - 01015.
  5. Architect's approval of temporary fence and layout - 01015.
  6. Architect's and Consultant's approval of substitutions - 01500.
  7. Architect's and Consultant's approval of cast-in-place concrete materials, sandblasting, tint, admixtures and tests - 03300.
  8. Architect's approval of caulking joint samples - 07900.
  9. Architect's approval of sealant samples - 07900.
3. Notify Architect:
  1. Notify Architect for Deficiency Inspection upon agreed Substantial Completion.
  2. Notify Architect for One-Year Holdback Inspection.
  3. Notify Client for Two-Year Roofing Inspection for Extended Warranties
  4. Notify Client for Two Year Inspection of Extended Warranties
  5. Notify Client for Three Year Inspection of Extended Warranties
  6. Notify Client for Five Year Inspection for Extended Warranties
  7. Notify Client for Ten Year Inspection for Extended Warranties.
4. Submit samples for approval.

**End of Section**

1. CONSTRUCTION SIGNAGE AND ADVERTISEMENTS

- 1.1 Construction sign to be supplied and installed by Contractor as detailed on the drawings. Locate as directed by Architect. All costs for the installation of the sign to be included in Base Tender Sum (not part of Signage Allowance). The Owner and Architect are to approve the sign layout prior to any sign production.
- 1.2 Erect no other signs, except those signs which are necessary to give direction or for safety, or warning signs, without the Architect's permission. Where other signs are required or wanted, obtain Architect's approval.

**END OF SECTION**

1. INTERFERENCE DRAWINGS

- 1.1 Before commencing any work, the General Contractor, along with their trade contractors, are to prepare working / interference drawings, to ensure that all components are to be properly accommodated within the spaces provided, ensuring all clearances required by jurisdictional authorities and for proper maintenance are indicated and maintained.
- 1.2 Schedule meetings on site with all associated trades to review all interference areas until all issues have been coordinated and required interference drawings issued.
- 1.3 Prepare drawings to indicate coordination and method of installation of a mechanical system with sprinkler, electrical, structural and other systems where their relationship is critical. Ensure all details of equipment, apparatus and connections are coordinated.
- 1.4 The General Contractor shall provide interference drawings prepared by their Mechanical, Sprinkler and Electrical subtrades. Drawings are to be red-line markups scanned to PDF Format and shall indicate any perceived interference between mechanical, sprinkler, structural, and electrical work and the work of all other Divisions along with proposed solution to such interference.
- 1.5 Failure to coordinate with all other trades could result in reworking of installed equipment, piping or ducting at the discretion of the Consultant. Any reworking to accommodate the installation of other trades is to be performed at no extra cost.
- 1.6 All interference drawings shall be submitted and approved prior to the second Certificate of Payment being released.

2. COOPERATION AND COORDINATION

- 2.1 Cooperate and coordinate with other trades as required, for satisfactory and expeditious completion of work. Take field dimensions relative to work. Fabricate and erect work to suit field dimensions and field conditions. Provide forms, templates, anchors, sleeves, inserts and accessories required to be fixed to, or inserted in work, and set in place or instruct related trades as to their location. Pay cost of extra work caused by and make up time lost, as a result of failure to provide inadequate time, the necessary cooperative information of items to be fixed to, or built in.

**END OF SECTION**

**1. GENERAL**

1. GENERAL

1. This section details General Contractor's responsibilities in preparation, submission and maintenance of construction schedules with form and requirements for periodic revisions. The Sub-Contractors shall provide the General Contractor with their schedule of work and co-ordinate the work with General Contractor and the Work Progress of other trades on site.

2. REQUIREMENTS INCLUDE

1. Schedule, form, content.
2. Stages/Phased Construction.
3. Schedule Revisions.
4. Weekly schedule updating.

3. SCHEDULES REQUIRED

1. Submit the following schedules:
  1. Construction Progress Schedule.
  2. Weekly Schedule and Manpower Loading.
  3. Submittal Schedule for Shop Drawings and Product Data and Shades.
  4. Product Delivery Schedule. Include required decision dates for finishes and colours.
  5. Sub-schedule showing submittals, review times, procurement schedules, and delivery dates.
  6. Sub-schedules to define critical portions of overall schedule.

4. FORMS OF SCHEDULES

1. Prepare schedules in form of horizontal bar chart (GANn, or C.P.M. network. Provide separate horizontal bar column for each trade or operation, or separate activity for each operation that can be completed independently of other operations or trades. Provide as follows:
  1. Order: Chronological order of beginning of each item of work.
  2. Identification: Identify each column by distinct graphic delineation.
  3. Horizontal Time Scale: Identify first work day of each week.

4. Scale and Spacing: To allow space for updating.
5. Minimum Sheet Size: 11" x 17" for electronic submission.

5. SUBMITTALS SCHEDULE

1. Include schedule for submitting shop drawings, product data, and samples. Co-ordinate with section 01300 requirements. Incorporate into Preliminary Progress Schedule and Weekly Schedule updates.
2. Indicate dates for submitting, review time, resubmission time, float time, and last date for meeting fabrication schedule.
3. Include dates when SUBMITTALS and delivery will be required for the Owner-furnished products if applicable.
4. Include dates when reviewed submittals will be required from the Consultant.

6. PRODUCT DELIVERY SCHEDULE

1. Include dates for delivery of products specified in Section 01020 - Allowances, if applicable.
2. Include dates for products furnished by Owner, if applicable.
3. Submit a schedule of required equipment order dates and delivery dates for products and/or assemblies which involve insignificant production time or fabrication time and/or will significantly affect the project schedule if not available when needed.

7. CONSTRUCTION PROGRESS SCHEDULE

1. Submit a preliminary construction schedule and phasing plan within ten working days of notification of bid acceptance, for approval.
2. Incorporate approved preliminary schedule in construction schedule specified in GC 3.5 of The General Conditions of The Stipulated Price Contract.
3. Submit a bar-chart progress schedule a minimum of seven (7) days before first progress application for payment. Prepare schedule in sufficient detail to indicate timing of major activities during phased progress of the Work and which will ensure completion of the Work on or before schedule.
4. On schedule indicate a time bar for each major construction activity to be performed at the site, properly sequenced and co-ordinate with other activities of work. Itemize activities in sufficient detail that no one bar exceeds two months in duration (separate long running trades such as Masonry into Logical Sub-Sections). Allow sufficient space below planned

time bar for another time bar to record actual progress.

5. Show dates for commencement and completion of all activities. Estimate duration period and float (contingency) time for each activity.
6. Show projected percentage of completion for each activity as of the date of submission of monthly progress payment applications and/or to the date of submission of schedule when requested.
7. Indicate actual progress of each activity to date of submission of schedule. Indicate current status of all activities to date of submissions of schedule by showing where behind, on or ahead of planned schedule.
8. Show changes occurring since previous submission of schedules:
  1. Major changes to scope
  2. Activities modified since previous submission
  3. Revised projections of progress and completion
  4. Other identifiable changes.
9. Confirm commencement, duration and completion dates of all activities with subcontractors, subtrades and suppliers.
10. Deliver to Architect, at the end of each calendar month with progress application a project status report derived from evaluation of Schedule.
11. Include in this report updated schedule together with such supporting narrative and such graphical presentations necessary to clearly outline the progress of Work, areas of current and anticipated problems, effect of changes on schedules of major trade subcontractors and proposed corrective action.
12. Be aware that the nature and day-to-day functioning of the Owner will have precedence over any phasing and arranged schedule, and stoppage of the work with good reason, and changes to the schedule may be made by the Owner on an as needed basis without prior notice and at no extra cost to the contract. The Contractor shall take this into account, and shall co-ordinate and co-operate with the Owner and reschedule the work to accommodate the Owner's requirements.
13. Lengthy shutdowns and disruptions of services will not be tolerated, and strict attention shall be paid to minimizing any disruption.
14. Schedule required work in occupied areas in co-ordination with the Owner and such schedule be approved by the Owner prior to start of the work. Provide two weeks minimum notice when work in existing area is required

8. STAGED/PHASE CONSTRUCTION

1. Prepare and submit sub-schedules for each separate stage of Work when pertinent to the project.
2. Provide sub-schedules to define critical portions of prime concern to master schedule.
3. Describe start and stop, float time and affected other work.

9. WEEKLY SCHEDULE UPDATE AND MANPOWER LOADING

1. Use the Construction Progress Schedule as a basis for reporting on a weekly basis the complete status of construction progress, scheduled activities and manpower loading on the project.
2. There will be an Owner/Architect/Consultant/General Contractor/Trade Contractor meeting every second week to review the project status. Provide a detailed 2 week work schedule (based upon the Construction Progress Schedule) outlining work activities and manpower requirements planned for that period.
3. Identify current and anticipated problems and delays with respect to the past work period the effects of said problems on the overall schedule and proposed corrective measures.
4. Submit to Architect two days prior to site meetings (every second week) the following:
  1. Updated Construction Progress Schedule.
  2. Outline of anticipated work activities for the forthcoming period.
  3. Outline of required and/or anticipated manpower levels (by trade) for the forthcoming period.
  4. Problems or delays experienced and/or anticipated.
  5. Proposed corrective measures to react to problems or delays.

**END OF SECTION**

**1. GENERAL**

1. GENERAL REQUIREMENTS

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

2. APPOINTMENT AND PAYMENT OF INSPECTION COMPANIES

1. Inspection and Testing Companies for various trades will be appointed by the Architect where specifically stated or required.
2. The cost of inspection and testing will be paid out of an allowance provided under Section 01020, except where tests or inspections reveal work not in accordance with the Contract, the Contractor shall bear the cost of such tests and additional tests as the Architect requires to verify the acceptability of corrected work.

3. RESPONSIBILITIES

1. The Architect will supply drawings and specifications as required for the use of the respective inspection and testing authorities and advise the Contractor of the Company appointed for the respective work.
2. The Contractor shall advise the Architect and the respective Inspection and Testing authority not less than 5 working days prior to the commencement of any work to be inspected or tested and ensure that proper facilities and co-operation is provided and that no work is carried out without the required inspection and testing.
3. Proper storage shall be provided for storing concrete specimens at the job site at the required temperature and free from vibration or injury.

**END OF SECTION**

1. ACCEPTABLE PRODUCTS

1. First item named or specified by catalogue number meets specifications in all respects regarding performance, quality of material and workmanship, and is acceptable to the Architect.
2. Items, other than first named, meeting specifications regarding quality of materials and workmanship only, are acceptable to the Architect, if they also meet performance, match the first named product in colour and texture, etc. and/or capacities specified and can be accommodated within the space allotted.
3. General approval indicated by inclusion of other manufacturers named is subject to final review of submitted samples of shop drawings, performance data and test reports.
4. Where the contractor uses equivalent products other than that first named, on which design is based, the contractor shall be responsible for all details of installation including product size, arrangement, fit, colour, etc. and maintenance of all required clearances. Contractor shall prepare and submit revised layouts to indicate arrangement of all affected piping, ductwork, conduit, lighting, equipment, etc. Failure by Contractor to provide such drawings may be considered indication that additional costs associated with equivalent products such as revisions to surrounding architectural finishes, structural components, or the need for larger motor starters, larger power feeders, space revisions to associated product equipment, controls, etc. shall be included in Bid price.

2. APPROVAL REQUIRED

1. The Contract is based on the materials, equipment, and methods described in the Contract Documents.
2. The Architect will consider proposals for substitution of materials, equipment, and methods only when such proposals are accompanied by full and complete technical data and all other information required by the Architect to evaluate the proposed substitution.
3. Do not substitute materials, equipment, or methods unless such substitution has been specifically approved for this work by the Architect, in writing.
4. Submit for review and approval full product characteristics comparison chart outlining the spec product and the proposed substitution product with indication if it meets or exceeds or is below the specified standard. This shall include but not limited to all product characteristics, material testing and manufacturing standards references, dimensional differences, colour availability variations.

3. "OR EQUAL"

1. Where the phrase "or equal", "approved equal", or "equal as approved by the Architect" occurs in the Contract Documents, do not assume that materials, equipment, or methods will be approved by the Architect.
2. The decision of the Architect shall be final.

4. AVAILABILITY OF SPECIFIED ITEMS

1. Verify prior to bidding that all specified items will be available in time for installation during orderly and timely progress of the work.
2. In the event specified items will not be so available, notify the Architect prior to receipt of bids.
3. Costs of delays because of non-availability of specified items, when such delays could have been avoided by the Contractor, will be back-charged as necessary and shall not be borne by the Owner.

**END OF SECTION**

**1. GENERAL**

1. REQUIREMENTS INCLUDED

1. Safety measures
2. Fire protection
3. Overloading precautions
4. Falsework
5. Scaffolding

2. CONSTRUCTION SAFETY MEASURES

1. Observe and enforce construction safety measures required by National Building Code (Part 8) and Ontario Building Code (latest edition as currently amended), Provincial Government, Workplace Safety & Insurance Board and municipal statues and authorities.
2. In particular, the Ontario Construction Safety Act, the regulations of the Ontario Department of Labour and Ontario Hydro Safety Requirements shall be strictly enforced.
3. In the event of conflict between any provisions of above authorities the most stringent provisions will apply.

3. MATERIAL SAFETY DATA SHEETS

1. Submit Material Safety Data Sheets (MSDS) for any product to be used, installed or applied inside of the building if said product may emit toxic fumes and/or noxious odours.
2. Submit Material Safety Data Sheets for any product which is known to or suspected of creating a health hazard or discomfort when used in confined spaces, including but not limited to the following:
  1. Adhesives
  2. Solvents
  3. Sealants (Caulking, etc.)
  4. Other products which may give off air borne particles after installation
  5. Any other product as direct by Architect/Consultants.
3. The required Material Safety Data Sheets to be submitted prior to ordering material or product for use as a part of the Work

4. The Owner may withhold payment for work of a subtrade or section until MSD Sheets for products supplied by that subtrade or section have been submitted, reviewed by Consultant and found to be acceptable.
5. Refer to Section 01700 - Project Close-Out for requirements regarding Certificates of Compliance.

4. MATERIALS SPECIFICALLY EXCLUDED

1. Asbestos and/or asbestos - containing products are not permitted. Submit Material Safety Data Sheets for any product suspected of containing asbestos if so requested by Consultant. Examples of some materials requiring close scrutiny and/or confirmation include:

1. Transite drainage pipe - whether buried or above grade - not permitted.
2. Insulation and/or jacketting for pipes, ducts, motors, pumps, etc. - not permitted if any asbestos is present.

2. Solder for all piping is to be lead-free. "Lead Free" shall mean solder which contains less than 0.030% of lead when dissolved in fluoroboric and nitric acids and tested by inductively coupled argon plasma atomic emission spectroscopy. Steelbond 281 and Silverbrite are acceptable solder products.

The mechanical contractor shall provide an affidavit signed by the principal of the company, on company letterhead, that all of the solder used on the project was either one of the two acceptable products or that the solder used (identified by brand name) meets or exceeds the testing criteria.

The Owner shall undertake random testing of the soldered joints. Should testing provide that the solder used was not as specified, the Owner shall take legal action against the contractor as appropriate.

3. All paint and finish coatings are to be lead and mercury-free. Submit Material Safety Data Sheets confirming that these products are free of all lead and/or mercury compounds.

5. FIRE SAFETY REQUIREMENTS

1. Comply with requirements of the local municipal fire department with respect to continuous fire safety on the job site.
2. Comply with fire safety requirements of other construction related authorities (Workplace Safety & Insurance Board, Ministry of Labour, construction trade unions, etc.). If more than one authority issues similar requirements, the more stringent shall govern.

- 
3. The appropriate clauses of the Ontario Building Code relating to fire protection shall be strictly followed.
  4. Provide and maintain free access to temporary or permanent fire hydrants and other fire protection equipment during performance of work required by insurance companies having jurisdiction and governing codes, regulations and by-laws.
  6. OVERLOADING
    1. Ensure no part of Work is subjected to a load which will endanger its safety or cause permanent deformation.
  7. FALSEWORK
    1. Design and construct falsework in accordance with latest issue of CSA S269.1-.
  8. SCAFFOLDING
    1. Design and construct scaffolding in accordance with latest issue of CSA-S269.2-.
  9. LIST OF MINIMUM SAFETY
    1. Include all provisions for construction safety such as fences, hoarding along streets, storage provisions facilities, sanitation facilities, fire protection, electrical supply, temporary heat, ventilation, construction equipment with its supports and guards, stairs, platforms, ladders, scaffolds, guardrails, walkway lighting and morality lighting, work around asbestos lead, silica and fumes, all as required by the Construction Safety Act and Regulation, latest edition of the Province of Ontario, as well as all other applicable regulations of Jurisdictional Authorities.
  10. OWNER SAFETY REQUIREMENTS
    1. The Contractor will take all necessary steps to protect personnel (workers, visitors, general public, etc.) and property from any harm during the course of the contract.
    2. All work procedures will be in accordance with Client legislated standards.
    3. All equipment shall be in safe operating condition and appropriate to the task.
    4. The Contractor shall ensure that only competent personnel are permitted work on site. The owner will throughout the term of the contract also remove from the site any persons not observing or complying with safety requirements.
    5. The Contractor shall provide competent personnel to implement their

safety programs and ensure that the owner's standards and those of the Ontario Health and Safety Act are being complied with.

6. Plant Services or the consultant will monitor every week to ensure that safety requirements are met and that safety records are properly kept and maintained. Continued disregard for safety standards can cause the contract to be cancelled and the Contractor or subcontractors removed from site.
7. The Contractor will report to the owner, architect and jurisdictional authorities any accident or incident involving Contractor, owner or public personnel and/or property arising from the contractor's execution of the work.

**END OF SECTION**

**1. GENERAL**

1. FIRES

1. Open fires and burning of rubbish are not permitted on the site.

2. DISPOSAL OF WASTES

1. Do not bury rubbish and waste materials on site.
2. Do not dispose of waste or volatile materials, such as mineral spirits, oil or paint thinner into waterways, storm or sanitary sewers.
3. All removal of waste products and debris resulting from the work must be audited and source-separated to comply with the most current version O.Reg 102 103 Industrial, Commercial and Institutional Source Separation Programs under the Environmental Protection Act and the 3 R's Regulation.

3. DRAINAGE

1. Provide temporary drainage and pumping as necessary to keep excavations and site free from water.
2. Do not pump water containing suspended materials into waterways, sewer or drainage systems.
3. Control disposal or runoff of water containing suspended materials or other harmful substances in accordance with local authority requirements.

4. SITE CLEARING AND PLANT PROTECTION

1. Refer to Division 2.

5. POLLUTION CONTROL

1. Provide and maintain temporary erosion and pollution control features including mud mats and siltation fences per the City of Kitchener and Ontario provincial standard details and requirements installed under this contract or previously installed.
2. Control emissions from equipment and plant to local authorities emission requirements.
3. Prevent sandblasting and other extraneous materials from contaminating air beyond application area, by providing temporary enclosures.
4. Cover or wet down dry materials and rubbish to prevent blowing dust and debris. Provide dust control for temporary roads.

6. NOISE CONTROL

1. Adhere to local noise bylaws.
2. Equip vehicles and equipment with efficient noise attenuation devices (mufflers) to minimize noise levels in vicinity of Site

3. Where necessary place noise attenuation devices (barriers) around stationery pumps and compressors.

7. WASTE MANAGEMENT CONTROL

1. Prepare Waste Audit and Waste Reduction Plans in accordance with O.Reg. 102/94 made under the environmental Protection Act for Waste Audits And Waste Reduction Work Plans. Ensure these plans are prepared prior to construction or demolition work proceeds on Site.
2. Prepare and implement a Source Separation Program in accordance with Ont. Reg. 103/94 made under the environmental Protection Act for Industrial Commercial source Separation Programs. Ensure program is implemented prior to construction or demolition work proceeds on Site.
3. Post plans on Site where most workers will see them, and allow any worker to view plans who makes such a request.
4. The following set of definitions are intended to augment terms provided within this Article:
  1. 3 R: REDUCE (REDUCTION), REUSE, RECYCLE
    1. REDUCE (REDUCTION) - Reduction involves actions to minimize quantity of waste at source and consequently, assumes highest priority in hierarchy of 3R activities.
    2. REUSE - Direct reuse of products which otherwise would become waste, provides another means of diverting quantity of waste destined for landfill.
    3. RECYCLE - Recycling involves collection of materials for use as feedstock in manufacturing of new products. Recycling can be most effectively accomplished if recyclable materials have been source separated at point of generation.
  2. SOURCE SEPARATION - Purposeful segregation of materials from designated solid waste stream into specific material types at point of generation to facilitate recycling.
  3. SOURCE SEPARATED MATERIALS - Specific types of materials that have been purposefully segregated from municipal waste into specific material types at point of generation.
  4. CONSTRUCTION BUSINESS - Business enterprise employing more than 50 persons out of 1 office involved in building, renovation and repair of immobile structures, including soil excavation and landscaping.
  5. DEMOLITION BUSINESS - Business enterprise employing more than 50 persons out of 1 office involved in dismantling any immobile structure, facility or dwelling.

5. Apply waste management activities of reduction, reuse and recycling of waste materials during construction and/or renovation of this Contract.
6. Construction/Demolition Businesses shall be required to source separate in accordance with Ont. Reg. 103/94, for purposes of recycling, following materials
  1. corrugated cardboard
  2. wood waste (i.e. non-treated dimensional lumber, manufactured wood)
  3. non-painted gypsum board
  4. ferrous metals
  5. Brick and Portland cement concrete
7. Submit agreement as requested to include source separation of above identified materials and other waste diversion activities during construction phase.
8. Requirements: During construction phase, Contractor shall be required to comply with following program requirements:
  1. Identify sorting, storage and disposal requirements anticipated during construction to maximize waste diversion;
  2. Establish reduction, reuse and on-site source separation activities during construction;
  3. Identify haulers and recycling companies that have entered into agreement with or have expressed willingness to enter into such agreement with Contractor;
  4. Identify person responsible for source separation program;
  5. Establish effective education and information program for on-site employees, including training sessions, use of signs, and designated waste diversion program;
  6. Establish cooperative agreements with Sub-Contractors/trades to abide by waste diversion program.
9. Contractor shall be willing to allow monthly on-site visits by Architect to review waste management/recycling program.
10. Immediately upon notification of award of Contract, and before starting work on Site, submit fully completed "Sub-Contractor Participation Form" appended to this Section to the Architect.
11. Contractors shall provide evidence that they can and shall implement required waste diversion program. Provision of evidence includes, but is not limited to following:

1. Written agreements with Sub-Contractors that they will participate in waste diversion program;
  2. Letters from reuse/recycling markets that they are in position to accept designed materials;
  3. Action plan prepared by Contractor for meeting objectives of waste diversion program; and
12. Contract Sum shall include costs for implementing waste diversion program.
8. HAZARDOUS MATERIALS
1. See Section 00840 Hazardous Materials.

**END OF SECTION**

**SUBCONTRACTOR PARTICIPATION FORM**

For source separation program to be effective, it is important for Subcontractors/trades to work cooperatively with your company. To ensure this cooperative arrangement will be carried out, you may wish to ask Subcontractors/trades companies to sign this agreement.

I hereby agree to participate in the source separation program to the best of my abilities.

1.      Company Name \_\_\_\_\_  
          Address            \_\_\_\_\_  
  
          Signature           \_\_\_\_\_  
                                  \_\_\_\_\_
  
2.      Company Name \_\_\_\_\_  
          Address            \_\_\_\_\_  
  
          Signature           \_\_\_\_\_  
                                  \_\_\_\_\_
  
3.      Company Name \_\_\_\_\_  
          Address            \_\_\_\_\_  
  
          Signature           \_\_\_\_\_  
                                  \_\_\_\_\_
  
4.      Company Name \_\_\_\_\_  
          Address            \_\_\_\_\_  
  
          Signature           \_\_\_\_\_  
                                  \_\_\_\_\_

**1. GENERAL**

1. REQUIREMENTS INCLUDED

1. Systems demonstration
2. Document submission
3. Project commissioning
4. Inspection and takeover procedures

2. SYSTEM DEMONSTRATION

1. Prior to final inspection, demonstrate operation of each system to the Owner and Consultant.

3. DOCUMENTS

1. Collect reviewed submittals in Section 01010 and 01300 and assemble documents executed by Subcontractors, suppliers, and manufacturers. Submit as per requirements in Section 01010 - General Requirements.
2. Provide bonds fully executed and notarized.
3. Submit a final statement of accounting giving total adjusted Contract Sum, previous payments, and monies remaining due.
4. Architect will issue a final change order reflecting approved adjustments to Contract Sum not previously made.

4. PROJECT COMMISSIONING

1. Expedite and complete deficiencies and defects identified by the Consultant.
2. Review record "as-built" drawings for completeness and then have "as-built" AutoCad 2010 or later drawings completed by a professional drafting service and provide "as-builts" on computer disks.
3. Review Cash and Contingency Allowances in relation to Contract Price, change orders, hold-backs and other Contract Price adjustments.
4. Submit required documentation such as statutory declarations, Workplace Safety & Insurance Board Certificates, certificates of approval or acceptance from regulating bodies.
5. Attend "end-of-work" testing and break-in or start-up demonstrations.
6. Review inspection and testing reports to verify conformance to the intent

of the documents and that changes, repairs or replacements have been completed.

7. Meet with structural consultant and inspection and testing consultant to coordinate completion, testing approvals.

5. INSPECTION/TAKEOVER PROCEDURES

1. The requirements of OAA/OGCA Document No. 100 "Take-Over Procedures" also govern applicable take-over procedures for this Contract.
2. Prior to application for certificate of Substantial Performance, carefully inspect the Work and ensure it is complete, that major and minor construction deficiencies are complete and/or corrected and the building is clean and in condition for occupancy. Notify the Architect, in writing, of satisfactory completion of the Work and request an inspection.
3. During the Architect/Consultant inspections, lists of deficiencies and defects will be tabulated. Correct same.
4. When the Architect/Consultants consider deficiencies and defects have been corrected and it appears requirements of the Contract have been performed, make application for certificate of Substantial Performance. Refer to General Conditions Article GC 14 for specifics to application.
5. All utility meters to be read and transferred into the Owner's name.

**END OF SECTION**

**1. GENERAL**

1. RELATED SECTIONS

1. Environmental Protection – Section 01560

2. DUST AND CLEANING REQUIREMENTS

1. Standards: Maintain project in accordance with the latest edition of The Occupational Health and Safety Act.

2. Hazards and Dust Control

- .1 Provide adequate ventilation during use of volatile or noxious substances.
- .2 Prevent spread of dust beyond the construction site by wetting, or by other means suitable for conditions, as it accumulates.
- .3 Provide Tack Mats at entrances to prevent dust and dirt from being traced through the project as required. Dispose of mats and replace on regular basis with new mat.

3. Floors

- .1 Keep troweled concrete floors free from oils, grease or other materials likely to damage them, discolour them or affect bond of applied finishes. Once building is enclosed, keep floors as dry as possible after curing.
- .2 To prevent soiling or damage to finish flooring where pedestrian traffic occurs after the flooring has been installed, install and maintain reinforced kraft paper temporary protection, secured in place and with joints sealed by reinforced pressure sensitive tape.
- .3 Install plywood panels of minimum 1/4" thickness over completed finish flooring materials on which further construction work is performed or delivery of products is made, or both. Seal joints between panels with reinforced pressure sensitive tape.

**2. PRODUCTS**

1. MATERIALS

1. Use only cleaning materials recommended by manufacturer of surface to be cleaned.
2. Use cleaning materials only on surfaces recommended by cleaning material manufacturer.

### **3. EXECUTION**

#### 1. DURING CONSTRUCTION

1. Execute cleaning to ensure that building, grounds, and public properties are maintained free from accumulations of waste materials and rubbish. Keep site clear of snow, mud and pooling of water due to severe rain. Ensure that work is not stopped because of failure to provide access to site.
2. Wet down dry materials and rubbish to prevent blowing dust.
3. At reasonable intervals during progress of Work, clean site and public properties and dispose of waste materials, debris and rubbish.
4. Unless otherwise specified, salvaged material resulting from construction, and surplus materials and construction debris shall become property of Contractor, who shall dispose of it away from site.
5. Vacuum clean interior building areas when ready to receive finish painting and continue vacuum cleaning on an as-needed basis until building is ready for Substantial Performance or occupancy.
6. Obtain from each Subcontractor, instructions which designate proper methods and materials to be used in final cleaning, and submit such instructions to the Consultant. Include Instructions in Manufacturer's Data Book specified in Section 01300.
7. Handle materials in a controlled manner with as few handlings as possible; do not drop or throw materials from heights.
8. Schedule cleaning operations so that dust and other contaminants resulting from cleaning process will not fall on wet, newly-painted surfaces.

#### 2. FINAL CLEANING

1. At completion of Work, remove waste materials, rubbish, tools, equipment, machinery, and surplus materials, and clean all surfaces exposed to view; leave project clean and ready for occupancy.
  2. Employ experienced workers, or professional cleaners, for final cleaning.
  3. In preparation for Substantial Performance or occupancy, conduct final inspection of interior and exterior surfaces exposed to view, and of concealed spaces.
  4. Remove grease, dust, dirt, stains, labels, fingerprints, and other foreign materials from all sight-exposed interior and exterior finished surfaces; polish resilient and ceramic surfaces so designated to shine finish. Vacuum carpet.
  5. Clean and polish glass and mirrors.
  6. Repair, patch and touch up marred surfaces to specified finish, to match adjacent surfaces.
  7. Broom-clean paved surfaces; rake clean other surfaces of grounds.
  8. Clean filters, exposed ductwork, and structure.
  9. Clean bulbs and lamps and replace those burned out.
  10. Clean diffusers and grilles.
  11. Clean sinks, faucets, and water closets and controls.
  12. Remove snow and ice from access to building.
  13. Maintain cleaning until project, or portion thereof, is occupied by Owner.
3. REMOVAL OF TEMPORARY FACILITIES
1. Completely remove temporary facilities from site, making good any damage when no longer required.

**END OF SECTION**

The printed forms outlined below shall form the basis of communication between the Architect and the General Contractor. Copies of forms unrelated to the issuance of monies, shall be kept on the site; neatly filed and readily accessible to the parties concerned.

1. TRANSMITTAL RECORD

A record of material issued by the Architect or General Contractor.

2. GENERAL REVIEW REPORT

A progress report completed by the Architect or Consultant on a regular basis.

3. PROPOSED CHANGE

A description of contemplated changes to the Contract.

4. CASH ALLOWANCE CHANGE ORDER

Assignment of money for work executed under the Cash Allowance Section.

5. CHANGE ORDER

Assignment of money for work executed beyond the financial limits of the Contract.

6. CHANGE DIRECTIVE

A description of a change in the work when the Owner requires the Contractor to proceed with a change in the work prior to the Owner and the Contractor agreeing upon the adjustment in Contract Price and Contract Time.

7. CERTIFICATE FOR PAYMENT

For release of contract money based on monthly progress draws.

8. SUPPLEMENTAL INSTRUCTIONS

A description and/or clarification for the purpose of recording a clarification or interpretation of the contract documents or giving directions on problems resulting from field conditions.

**END OF SECTION**

1. NEWFORMA SOFTWARE SYSTEM

- 1.1 This project will be administered through the Architect using the NEWFORMA software system.
- 1.2 The Contractor is required to use this internet based software for ALL project communications, RFIs, quotations, project schedule, shop drawing log, change log, RFI log, etc., including all administrative forms as outlined in Section 01800 and construction schedules as outlined in Section 01310. All shop drawings, interference drawings and as-built drawings shall be submitted electronically through the Newforma Info Exchange in PDF format and shall be numbered in the order which they are submitted. Numbering shall be in the following format; 001, 002, 003, etc. Submittals will not be deemed as received unless delivered through Newforma Info Exchange.
- 1.3 Utilization of this system does not require the purchase or download of the Newforma software. The Architect will send an email notification which will automatically provide online access to the Newforma Info Exchange specific to this project.

2. NEWFORMA INSTRUCTIONS

1. You will receive an email instructing you how to get into the system (click on link). The system is self-explanatory as to the "use" for Submittals (Shop Drawings) and RFIs. Refer to attached screen shots.
2. When issuing Submittals and RFIs, the following people are to always be COPIED (not addressed to):  
  
Linda Butler                      lbutler@plusvg.com
3. Shop Drawings are to be issued as "Submittals". There is a place on the Submittal section to put in the Contractor's "expected response date" – please ensure that is filled in. Submittals are to be numbered in the sequence which they are submitted. Numbering to be as follows; 001, 002, 003, etc. (NOTE: as per the contract, the Architect has 10 working days to respond).
4. RFIs: There is a place on the RFI section to put in the Contractor's "expected response date" – please ensure that is filled in. RFI's are to be numbered in the sequence which they are submitted. Numbering to be as follows; 001, 002, 003, etc.. (NOTE: as per the contract, the Architect has 5 working days to respond)
5. RFCs: (all Contractor quotations to be submitted as an RFC) RFC's are to be numbered in the sequence which they are submitted. Numbering to be as follows; 001, 002, 003, etc.
6. Submittals and RFI's requiring consultant review other than the Architect shall be sent via Newforma directly to the respective consultant. The +VG Project Manager as well as the persons noted above shall be copied on all submittals and RFI's.

7. All shop drawings, interference drawings and as-built drawings shall be submitted electronically through the Newforma Info Exchange in PDF format. Submittals will not be deemed as received unless delivered through Newforma Info Exchange.

**END OF SECTION**

1. The procedure for early release of construction lien holdback monies shall be initiated by the General Contractor's written request for an inspection to determine the date of 100% completion of the subcontract. This request shall be complete with the following documentation:
  1. Statutory declaration from the General Contractor that all work under the subcontract is 100% performed.
  2. Statutory declaration from the Subcontractor that all work under the subcontract is 100% performed.
  3. Workplace Safety & Insurance Board interim release for the General Contractor.
  4. General Contractor's written guarantee to the Owner that they will make good any work of the Subcontractor as required by the contract documents.
  5. Confirmation that the bonding company has been notified of the intent to claim early release of holdback monies.
2. Upon satisfactory receipt of all documentation required under item 1 above, the Architect and/or their Consultants shall review the work within ten (10) working days. If satisfied that all work under the particular subcontract has been properly performed, the Architect shall issue a certificate to the Owner, General Contractor and Subcontractor within seven (7) working days of the date of the inspection of the work. The date of the inspection shall be noted by all parties.
3. The General Contractor shall then issue, over the signature of one of their officers, a statutory declaration to the Owner, to the effect that:
  1. No written notices of lien have been received by them.
  2. The Subcontractors have been paid in full, except for construction lien holdback.
  3. Final net amount of the subcontract, and the amount owing to it are as stated in the declaration.
4. The Subcontractor shall issue, simultaneously, and over the signature of one of their officers, a statutory declaration to the Contractor, to the effect that:
  1. They have received no written notices of lien claims.
  2. Their own Subcontractors and suppliers are listed completely in the declaration.
  3. They have received payment in full from the General Contractor except for Construction lien holdback.
  4. Final net amount of their Subcontract and amount owing to it are as stated in the declaration.
  5. They have received the certificate issued by the Architect pursuant to Part IV of

the Construction Lien Act on \_\_\_\_\_ day of \_\_\_\_\_ 20 \_\_\_\_.

5. The Subcontractor must provide releases from the Workplace Safety & Insurance Board on their own behalf and on behalf of their Subcontractors and Suppliers.
6. The Subcontractor shall provide a waiver of lien rights to the Owner, on their own behalf, and on behalf of their Subcontractors and Suppliers.
7. A Construction Lien Search shall be made 45 calendar days after the date that the Architect's Certificate has been advertised in the Daily Commercial News as per the current Construction Lien Act provided that:
  1. No liens or certificates of action are registered.
  2. All documents noted herein have been received; and
  3. No written or oral notices of lien claims or of unpaid Subcontractors, Sub-subcontractors or Suppliers have been received by the Owner.

The Owner shall then make payment to the General Contractor on the basis of the Architect's Certificate for Payment.

NOTE: The early release of holdback monies does not affect the commencement date and warranty requirements of the Contract, (i.e. the warranty period for the subcontract shall commence on the date of substantial performance of the prime contract).

**END OF SECTION**

**1. GENERAL**

1.1. Conform to Sections of Division 1 as applicable.

**1.2. REFERENCES**

1.2.1. CSA S350 M80 (R2003) Code of Practice for Safety in Demolition of Structures

**1.3. QUALITY ASSURANCE**

1.3.1. Regulatory Requirements:

1.3.2. Conform to the latest Occupational Health and Safety Act, as currently amended.

1.3.3. Most recent Occupational Health and Safety Act, as currently amended, Designated Substance - Asbestos on Construction Projects and in Building and Repair Operations;

1.3.4. Conform to OBC, especially Article 2.3.2.3 as applicable.

1.3.5. Conform to Fire Code, Regulation under Fire Marshals Act especially Part 8.

1.3.6. Remove hazardous materials in accordance with applicable laws and regulations.

1.3.7. Qualifications:

Employ for this work demolition company having 5 years Canadian experience in this type of work satisfactory to Architect. If requested, submit proof of experience.

**2. PRODUCTS**

2.1. All existing components being demolished shall become property of this Section. Remove from Site.

**3. EXECUTION**

**3.1. PREPARATION**

3.1.1. Protect **all** existing adjacent work (wainscoting, plaster walls, bases and trim, etc) against damages which might occur from falling debris, scrapes or other causes due to work of this Section.

3.1.2. Erect and maintain dustproof partitions as required to prevent spread of dust to other parts of building. On completion, remove partitions and make good surfaces to match adjacent surfaces of building. Ensure that all dust and debris is removed before finishing work commences.

3.2. PERFORMANCE

- 3.2.1. Contractor to remove existing flooring as noted on the drawings.
- 3.2.2. Contractor to remove existing light fixtures and associated wiring as noted on the drawings.
- 3.2.3. Contractor to carry out selective demolition (cutting out) of existing ceilings as noted on the drawings.
- 3.2.4. Contractor to carry out selective demolition (cutting out) of existing plasterwork as noted on the drawings, to repair cracks and conceal / recess electrical wiring, switches and receptacles. Refer to Section 09200.
- 3.2.5. Contractor to remove existing windows complete with brick masonry fill and steel lintel above unless noted otherwise on the drawings.
- 3.2.6. Contractor to remove existing doors as noted on the drawings.
- 3.2.7. Contractor to remove existing millwork, sinks, appliances, ductwork, plumbing and electrical as noted on the drawings.
- 3.2.8. Materials and debris shall not be stacked in building but removed entirely from all circulation spaces at the end of each day.
- 3.2.9. At end of each day's work leave work in safe and clean condition.
- 3.2.10. Carry out demolition in accordance with requirements of CSA S350-M. Demolish and remove materials from Site.

3.3. DISPOSAL OF WASTE MATERIALS

- 3.3.1. Selling or burning of materials on Site is not permitted.
- 3.3.2. Provide bin for garbage on sidewalk in a location acceptable to the Owner.
- 3.3.3. Conform to requirements of municipality's Works Department regarding disposal of waste materials.
- 3.3.4. Materials prohibited from municipality waste management facilities shall be removed from Site and dispose of at recycling companies specializing in recyclable materials.

**END OF SECTION**

## **PART 1 - GENERAL**

### **1.1 WORK INCLUDED**

- .1 Provide all labour, materials, accessories and equipment to prepare for, mix, transport, place, finish and cure cast-in-place concrete and grout necessary to construct structure required by the design, specified herein, and as required for the complete and proper provision of Work of this Section, including, but not limited to, the following:
  - .1 concrete including cementing materials, fine and coarse aggregates, admixtures and water
  - .2 steel or polypropylene reinforcing fibres
  - .3 granular underbed and vapour barrier
  - .4 curing and finishing
  - .5 metallic, non-metallic and dry-pack grout, together with grouting of column base and beam bearing plates

### **1.2 QUALITY VERIFICATION**

- .1 Reference Standards, Codes and Acts
  - .1 The latest edition of the following Reference Standards, Codes, and Acts shall govern Work of this Section. Where there are differences between the specifications and drawings and the codes, standards, or acts, the most stringent shall govern. Standards referenced within the Standards noted below are to apply even if they are not included in the list.
    - .1 National Building Code of Canada, 2010 (NBC)
    - .2 Ontario Building Code, 2012 (OBC)
    - .3 Canadian Standards Association (CSA)
      - .1 CSA A23.1-04, Concrete Materials and Methods of Concrete Construction
      - .2 CSA A23.2-04, Methods of Test and Standard Practices for Concrete
      - .3 CSA A23.3-04, Code for the Design of Concrete Structures for Buildings
      - .4 CSA A283-06, Qualification Code for Concrete Testing Laboratories
      - .5 CAN/CSA-A3000-08, Cementitious Materials Compendium
      - .6 CSA S413-07, Parking Structures
- .2 Qualifications
  - .1 Provide concrete only from sources for which plant, equipment and materials comply with CSA A23.1/A23.2.
  - .2 Undertake preparation for and application of specified penetrant sealant only by personnel with a minimum of five years documented experience in the successful application of water-based penetrant sealers.
- .3 Inspection and Testing
  - .1 As per SECTION 03 05 00

- .2 Be aware that Contractor retains sole responsibility for quality control of Work and that performance or non-performance of Independent Inspection and Testing Company does not limit, reduce, or relieve Contractor of responsibility for complying with the requirements of the Project Agreement.
- .3 Independent Inspection and Testing Company must be certified under CSA Standard A283, Qualification Code for Concrete Testing Laboratories, for Category 1 Certification.
- .4 Project Records
  - .1 Concrete Pour Records – Record time, date, delivery slip serial number, and area of placement in building of each concrete pour, correlate with related test cylinders and maintain records on site until Project is completed.
  - .2 Delivery Records – File duplicate copies of concrete delivery slips recording supplier, serial number of slip, date, and truck number. Contractor, Project, Class of exposure, cementing materials content, air content, volume in load, time of first mixing of aggregate, cementing materials, added water and ambient air temperature.
  - .3 Record Drawings – Record on a set of Drawings:
    - .1 time and date of each pour
    - .2 high and low ambient air temperatures during each pour
    - .3 date of removal of forms in each area of Work
    - .4 founding elevations of all footings or drilled piers
    - .5 variations of foundation Work from that indicated on drawings
  - .4 Make Record Drawings available for Consultant's inspection at all times.

### **1.3 SUBMITTALS**

- .1 Concrete Producer's Certification
  - .1 Prior to submitting mix designs for review, submit certification that plant, equipment and materials to be used in concrete comply with requirements of CSA A23.1/A23.2
- .2 Concrete Mix Designs
  - .1 Submit designs for concrete mixes required by Contract Documents.
  - .2 When optimum bulk density of aggregates is specified, provide supporting evidence of compliance with requirements.
  - .3 Be aware that review of concrete mix design is for general conformity and that Contractor retains responsibility for compliance with Contract Documents.
- .3 Manufacturer's Certification
  - .1 Submit certificate from manufacturer certifying that product proposed conforms to specified performance requirements.
- .4 Contractor's Quality Control
  - .1 Submit proposed quality control procedures for hot or cold weather conditions, for ensuring correlation of concrete mix with strength or exposure classification for area of placement, and for finishing and curing methods.
- .5 Joint Location Drawings

- .1 Submit Drawings showing proposed location of construction and control joints in slab-on-grade in accordance with Typical Detail if joint layout is not detailed on Drawings.

#### **1.4 ARCHITECTURAL CONCRETE**

- .1 Architectural Concrete is defined as concrete surfaces designated as "Architectural Concrete" in Project Agreement including surfaces specified to receive finish treatment such as sandblasting and bush-hammering.
- .2 Place, finish, cure and strip Architectural Concrete to ensure hard, dense, smooth and true concrete surfaces of uniform appearance without damage, defects or blemishes.

#### **1.5 ENVIRONMENTAL CONDITIONS**

- .1 Comply with the Cold and Hot Weather Requirements of CSA A23.1/A23.2 and additionally as specified herein.
- .2 Provide protection or heat, or both, to ensure temperature of concrete at surfaces is maintained at not less than 21°C for three days after placing, not less than 10°C for the next two days and above freezing for the next two days.
- .3 Provide protection or heat or both to prevent alternate freezing and thawing of concrete for fourteen days after placing.
- .4 Vent exhaust gases from combustion type heaters outside of protection enclosures.
- .5 Provide protection to maintain concrete continuously moist during curing period.
- .6 Provide same hot or cold weather protection for storage of field cured cylinders demonstrating strength development of in-situ concrete as for area of concrete construction which it represents until cylinders are sent to testing laboratory.
- .7 Do not commence placement of concrete when it is raining or rain is anticipated. Should rain commence during placing cover freshly placed concrete with waterproof material.
- .8 Place bonded toppings on rough slabs only when surface temperature is at least 15°C [60°F].
- .9 Do not grout at ambient air temperatures or concrete surface temperatures less than 5°C [40°F], or when air or surface temperature is expected to fall below 5°C [40°F] within 24 hours of grouting.
- .10 Do not apply sealants, or penetrant sealer, at ambient air temperatures or concrete surface temperatures less than 5°C [40°F], or when air or surface temperature is expected to fall below 5°C [40°F] within 12 hours of application.

### **PART 2 - PRODUCTS**

#### **2.1 MATERIALS**

- .1 Cementing Materials
  - .1 Portland Cement: to CSA Standard A3000, Type 10 Cement unless noted otherwise.
  - .2 Cementitious Hydraulic Slag: to CSA Standard A3000.
  - .3 Flyash: to CSA Standard A3000.
- .2 Fine Aggregate
  - .1 For slabs-on-grade, fineness modulus of fine aggregate to be between 2.7 and 3.1.

- .3 Coarse Aggregates
  - .1 20 mm [3/4"] to 5 mm [No. 4 sieve] except as specified below.
    - .1 For Slabs-on-Grade
      - .1 Abrasion loss not to exceed 35%.
      - .2 Maximum petrographic number of 125 when tested in accordance with ASTM C295, as conducted by Ministry of Transport of Ontario.
    - .2 For Slabs-on-Grade 125 mm [5"] and Thicker
      - .1 40 mm [1 1/2"] to 5 mm [No. 4 sieve]; combine at least two of the single sizes specified in Table 2 Group II of CSA A23.1/A23.2, one of which is to be 40 mm [1 1/2"], to obtain maximum bulk density (unit weight) and optimum grading, in accordance with an approved procedure.
    - .3 For Slabs Over Steel Deck (Composite or Non-composite) and Bonded Toppings 50 mm [2"] Thick and Less:
      - .1 12 mm [1/2"] to 5 mm [No. 4 sieve].
    - .4 For columns less than 300 mm [12"] in least dimension, or less than 95,000 mm<sup>2</sup> [150 in<sup>2</sup>] in cross-sectional area, walls less than 200 mm [8"] in width and concrete for grouting masonry:
      - .1 10 mm [3/8"] to 5 mm [No. 4 sieve].
- .4 Water
  - .1 To conform to CSA A23.1/A23.2
- .5 Admixtures
  - .1 Conform to Reference Standards for chemical and air-entraining admixtures.
  - .2 Provide only admixtures that are free of chlorides.
  - .3 Provide evidence acceptable to the Design Team that superplasticizer does not increase shrinkage of concrete.
- .6 Steel Fibres
  - .1 Cold drawn carbon steel, corrugated profile or straight with hooked ends, with following performance requirements:
    - .1 Length: 51 mm ["] minimum
    - .2 Diameter: 0.75 mm [0.03"] minimum
    - .3 Aspect ratio: 75 minimum
    - .4 Yield strength: 965 MPa [140 ksi] minimum
- .7 Polypropylene Fibres
  - .1 100 percent virgin polypropylene, collated, fibrillated fibres; 50 mm [2"] nominal length.
- .8 Granular Underbed for Slabs-on-Grade
  - .1 As recommended by the Geotechnical Engineer
- .9 Vapour Barrier
  - .1 0.152 mm [6 mil] thick polyethylene sheet to CAN/CGSB-S1.34-M, perforated with 8 mm [5/16"] diameter holes at 150 mm [6"] centres, each way.

- .10 Curing / Sealing Compound:
  - .1 Water based acrylic emulsion membrane curing compound to ASTM C309, Type 1 generally.
  - .2 Curing / sealing compounds to be compatible with any specified floor hardeners, covering adhesives and waterproofing compounds.
- .11 Grout
  - .1 Dry Pack Grout – under steel plates and where grout thickness does not exceed 75 mm [3"]
    - .1 One part Portland cement to two parts concrete sand that conforms to CSA A23.1/A23.2 with only sufficient water that mix will retain its shape when made into ball by hand.
  - .2 Premixed Grout:
    - .1 Mix with water in accordance with manufacturer's printed instructions.
    - .2 Must be non-shrink and may be metallic or non-metallic.

## **2.2 CONCRETE MIXES**

- .1 Concrete
  - .1 Ready mix with 28 day compressive required by the design.
  - .2 Air dry unit weight:
    - .1 Typically for normal weight concrete, minimum 2300 kg/m<sup>3</sup> [145 lbs/ft<sup>3</sup>] adjusted proportionally for maximum air content listed in CSA A23.1/A23.2, Clause 14 - Table 10.
  - .3 Design concrete mix in conformance with CSA A23.1/A23.2, Clause 16 - Table 13 (Alternative 1), Clause 15 - Table 12, Clause 17 - Table 14, and as follows:
    - .1 Provide concrete meeting water / cementing materials ratio and air content of Tables 12 and 14 in accordance with Class of Exposure specified in Table of Concrete Properties on Drawings. Note that concrete designed in accordance with water/cementing materials ratio of Tables 12 and 14 may yield strength exceeding minimum strength specified on Drawings.
  - .4 Sulphate Exposure:
    - .1 If required, provide concrete mix in accordance with Clause 15, Table 10 of CSA A23.1/A23.2, for concrete subject to sulphate attack, such as drilled shafts or other concrete in contact with soil.
  - .5 Submit to Inspection and Testing Company if requested, acceptable evidence and material samples to verify that proposed concrete mix design will produce specified quality of concrete.
- .2 Admixtures
  - .1 Chemical Admixture:
    - .1 Incorporate water-reducing admixture to ASTM C494 type A in all concrete.
  - .2 Air Entraining Agent:
    - .1 Incorporate air-entraining agent in addition to chemical admixture in concrete of relevant Class of exposure, in accordance with CSA A23.1/A23.2, Clause 15, Table 9.
  - .3 Calcium Chloride:

- .1 Do not use calcium chloride or admixtures containing chloride in concrete.
- .3 Architectural Concrete
  - .1 For concrete required to be Architectural Concrete obtain aggregate and cement for entire Project from same source at same time.

### **PART 3 - EXECUTION**

#### **3.1 EXAMINATION**

- .1 Confirm that subgrade of compacted fill conforms to requirements specified for backfilling before placing slab underbed.
- .2 Confirm that surfaces on which concrete is to be placed are clean and free of debris, frost and water before placing.
- .3 Confirm that concrete reinforcement, control joints, inserts and all other built-in Work is in place and secured, before commencing placement of concrete.
- .4 Confirm that placement of conduct or pipe within concrete section conforms to requirements of CSA A23.1/A23.2 prior to commencement of placement of concrete

#### **3.2 TOLERANCES**

- .1 Place and finish concrete to provide tolerances in accordance with CSA A23.1/A23.2 and ACI 117, and additionally as specified herein.
- .2 Difference between elevation of high point and low point in specified area not to exceed:
  - .1 In any bay up to 100 m<sup>2</sup> [1100 ft<sup>2</sup>]: .....12 mm [1/2"]
  - .2 In any bay up to 400 m<sup>2</sup> [4300 ft<sup>2</sup>]: .....25 mm [1"]
- .3 F-Number System:
  - .1 Finish floor slabs to meet tolerance classification in accordance with CSA A23.1/A23.2, Clause 22.1.3 and Table 16 deemed appropriate for the use of the space.
  - .2 Measure FL levelness tolerance at 72 ± 12 hours after completion of floor finishing, on formed slabs before removal of shores and on slabs-on-grade

#### **3.3 PREPARATION FOR SLABS-ON-GRADE**

- .1 Granular Underbed:
  - .1 Obtain Geotechnical Consultant's written confirmation that prepared subgrade is acceptable for placement of granular underbed.
  - .2 Place granular underbed over entire area of building and compact to 100% ASTM D698 (Standard Proctor) optimum dry density.
  - .3 Obtain Geotechnical Consultant's confirmation that thickness, elevation and compaction of granular underbed are acceptable.
- .2 Vapour Barrier:
  - .1 Use vapour barrier under slabs on grade only where the floor will be covered with finish material adhered with adhesives that may be adversely affected by moisture or where materials will be stored that could be adversely affected by moisture.
- .3 Remove foreign materials from underbed and forms before placing concrete.

### **3.4 PLACING CONCRETE**

- .1 Transport and place concrete in accordance with CSA A23.1/A23.2, and additionally as specified herein.
- .2 Place concrete for entire floor framing system including beams, girders, slab drops, brackets, column capitals and haunches monolithically unless otherwise noted on Drawings.
- .3 Transport and spread concrete over steel framing in a manner to prevent lateral deflection and twisting of members.

### **3.5 FINISHING CONCRETE**

- .1 Floor, Roof, Stair Treads, and Other Slab Surfaces
  - .1 Perform finishing operations on plastic concrete surfaces in accordance with CSA A23.1/A23.2, Clause 22, and as specified herein.
  - .2 Be aware that concrete for this Project may contain slag or flyash cement which results in delay of concrete set and onset of bleeding.
  - .3 Screed surface to an even, level, or sloped surface, to elevations indicated on Drawings or required for specified finishes or concrete toppings.
  - .4 Float surfaces by means of power or hand float when concrete has hardened sufficiently for worker to leave only slight footprint on surface, taking care to avoid bringing bleed water and fines to surface by overfloating.
  - .5 Do not commence finishing of slab surfaces while bleed water is on surface, or add water or cement to surface.
  - .6 Finish slab surfaces to match sample finishes approved by the Design Team.
  - .7 Unless otherwise required by the design, finish slab surfaces to provide a hard, smooth, dense steel trowelled surface, free of ridges or depressions, trowel marks or blemishes, and of uniform appearance.
  - .8 Non-Slip Floor Surfaces:
    - .1 Provide swirled finish of texture acceptable to Consultant by spin troweling final steel troweling.
- .2 Control Joints in Slabs-on-Grade
  - .1 Sawcut control joints in slabs-on-grade along column grid lines and additionally to result in a maximum spacing of 30 times slab thickness, except where concrete mix incorporates 40 mm [1 ½"] aggregate proportioned to provide maximum bulk density in accordance with Clause 2.1.3.1.1, sawcut intermediate control joints to result in a maximum spacing of 40 times slab thickness.
  - .2 Commence sawcutting before slab temperature starts to fall and as soon as concrete may be cut without dislodging aggregate but within 18 hours of placement.
  - .3 Sawcut unreinforced slabs to a depth of 0.25 slab thickness, fibre reinforced slabs to 0.33 slab thickness.
  - .4 Grind edges of sawcuts to remove burrs but do not bevel or chamfer joint edges.
  - .5 Keep construction traffic which may erode concrete at edges of sawcuts off floor until joints have been filled and joint filler has cured.
- .3 Formed Surfaces
  - .1 Treat formed surfaces in accordance with CSA A23.1/A23.2, Clauses 24.1 and 24.2, and as additionally specified herein

- .1 Finish vertical surfaces to receive waterproofing membrane smooth with no ridges or depressions.
- .2 Finish surfaces to receive a hot-applied rubberized asphalt membrane smooth with no ridges or depressions, using "Sack-Rubbed Finish" in accordance with CSA A23.1/A23.2, Clause 24.3.4.4 including cleaning surfaces of dust, oil, grease, chemical films, or other coatings or contaminants, and loose or spalled material, repairing any honeycombed areas and removing any projecting mortar or concrete fins.
- .3 Finish surfaces to receive crystalline waterproofing smooth with no ridges or depressions, using "Sack-Rubbed Finish" in accordance with CSA A23.1/A23.2, Clause 24.3.4.4 including cleaning surfaces of dust, oil, grease, chemical fills, or other coatings or containments, and loose or spalled material, repairing any honeycombed areas and removing any projecting mortar or concrete fins.
- .4 Repair, re-rub, regrind or otherwise correct concrete surfaces to approval of Consultant and trade applying waterproofing or adhering finish to surface.
- .5 Plugs at Recessed Ties
  - .1 Clean tie holes to remove all foreign matter.
  - .2 Coat plugs by dipping in adhesive and insert in hole.
  - .3 Remove excess adhesive immediately with thinner recommended by manufacturer to ensure that concrete surface is not stained or blemished in any way.
- .6 Elastomeric Membrane
  - .1 Where fluid elastomeric waterproofing membrane turns up vertical surfaces, provide light sandblast finish.
- .4 Curb Edging
  - .1 Finish external corners of curbs rounded, smooth and straight without undulations.
- .5 Stair Tread Non-Slip Inserts:
  - .1 Install one non-slip insert specified in Paragraph 2.2.15 at each tread and landing, place 40 mm [1 1/2"] from edge of nosings and extend for full width of nosings except for 80 mm [3"] at each end.
  - .2 Set inserts in prepared grooves, secured with waterproof adhesive and with top set 1 mm [0.04"] above treads.
- .6 Finishing Architectural Concrete
  - .1 Perform finishing of Architectural Concrete surfaces only by competent personnel with demonstrated experience in finishing of Architectural Concrete surfaces.
  - .2 Ensure that tools and handling equipment are completely clear of rust, chemicals, contaminants, hardened concrete and other foreign material which would cause discolouring or blemishes.
  - .3 Finish plastic Architectural Concrete surfaces in accordance with Article 1.4.2.
  - .4 When required by the design, sandblast Architectural Concrete surfaces specified to medium texture evenly over each surface and consistently throughout Project to match approved mock-up.
    - .1 Protect other surfaces and equipment against damage resulting from sandblasting operations.
    - .2 Use material that will minimize environmental contamination.

- .5 When required by the design, bush-hammer Architectural Concrete surfaces specified to medium texture evenly over each surface and consistently throughout Project to match approved mock-up. Take care to avoid breaking external corners of bush-hammered concrete.

- .1 Remove debris from finishing operations.

### **3.6 BONDED CONCRETE TOPPINGS**

- .1 Conform to CSA A23.1/A23.2, Clause 23, and as additionally specified herein.
- .2 Be aware that thickness of topping required by the design is the nominal value and that actual thickness will vary depending on cambers or deflections of supporting framing.
- .3 Place each section of bonded topping in one continuous operation taking special precautions against plastic shrinkage cracking, whenever rapid drying of the topping may occur, in accordance with CSA A23.1/A23.2, Clause 21.
- .4 Control Joints in Topping
  - .1 Provide control joints for topping directly over construction joints in base slab.
  - .2 Provide control joints in toppings over precast slabs, on centre lines of supporting members, and at 5 m [16'-0"] maximum spacing parallel to span of slabs.
  - .3 In all other respects comply with sawcut control joint requirements for slabs-on-grade.

### **3.7 CURING AND SEALING**

- .1 Cure concrete in accordance with CSA A23.1/A23.2, Clause 21 and as specified herein.
- .2 Be aware that proper curing is essential for durable concrete, and that failure to cure properly may result in accelerated deterioration including scaling, dusting and spalling.
- .3 Curing Compound Method:
  - .1 Use curing and sealing compound specified in Clause 2.1.10 except:
    - .1 On surfaces specified to receive epoxy or **similar** paint finish.
    - .2 On surfaces specified to receive architectural finishes which require adhesives which are incompatible with the curing compound.
    - .3 Air-entrained concrete for exterior slabs and sidewalks placed between October 1 and April 1.
  - .2 Use specified water-based compound except that when temperature is below 5°C [40°F] use solvent-based compound acceptable to Consultant.
  - .3 Apply curing and sealing compound in strict accordance with manufacturer's instructions, ensuring complete and adequate coverage of surface.
- .4 Plastic Film Method
  - .1 Where curing compound method cannot be used, and surfaces are not exposed to freezing and thawing or deicing chemicals, cure finished slab surfaces as follows:
    - .1 Cover with 0.102 mm [4 mil] thick polyethylene sheets, lap edges 100 mm [4"] minimum and seal laps.
    - .2 Leave in place for the "Basic Curing Period" in accordance with CSA A23.1/A23.2, Clause 21.1.2, but in no case for less than 3 days generally, except not less than 7 days for exposed warehouse and industrial floor surfaces.

**3.8 PROTECTION**

- .1 Protect floor slabs and other concrete surfaces on which toppings or finishes are to be applied, from grease, oil, dirt and other materials or compounds which would impair bond of toppings or finish materials.
- .2 Protect Architectural Concrete surfaces and surfaces exposed to view or painted from grease, oil, dirt and other materials or compounds which would create surface blemishes or impair bond of finishes.

**3.9 GROUTING FOR STEEL MEMBERS**

- .1 Cooperate with Sections that supply and set base and bearing plates in scheduling and completing grouting.
- .2 Provide and place grout under column base and beam bearing plates, and additionally as required by the design.
- .3 Use non-shrink and shrinkage-compensating grouts only when grout will be contained against expansion and self-disintegration, and in strict accordance with manufacturer's instructions.
- .4 Do not use grout with fluid or flowable consistency at beam bearing plates unless otherwise indicated, or approved by the Design Team.
- .5 Dampen concrete surfaces immediately before installing grout.
- .6 Install grout in a manner to ensure positive bearing for full area of steel base or bearing plate with no voids.
- .7 Slope grout beyond edge of plate at 45 degrees unless otherwise required by the design.
- .8 Provide same environmental protection and curing as specified for concrete.

**3.10 SITE CLEAN UP**

- .1 Remove excess materials including waste hardened concrete, mock-up panels, sample areas, and other debris resulting from Work of this Section from site and leave premises in a condition acceptable to Consultant.

**3.11 DEFECTIVE WORK**

- .1 Failure of materials or workmanship to meet requirements of the Project Agreement including failure to meet specified 28 day concrete strength, variations in hardened surface in excess of specified tolerances, marked, disfigured or honeycombed surfaces which do not meet surface finish requirements and cannot be repaired by approved methods, and failure of products to meet specified performance requirements, will be considered defective Work performed by this Section.
- .2 Repair or replace defective Work as directed by the Sponsor.
- .3 Pay for additional inspection and testing, redesign, corrective measures, and related expenses required to correct defective Work of this Section

**END OF SECTION**

**1. GENERAL**

1. GENERAL REQUIREMENTS

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

2. SHOP DRAWINGS

1. Submit shop drawings in accordance with Article G.C. 3.11 of CCDC Document 2-2020.
2. Submit shop drawings for review by the Architect prior to fabrication.
3. Design Criteria-Applicable Standards:
  1. All standards in accordance with latest issue.
  2. CSA Standard CAN3-S16.1-M, "Steel Structures for Buildings" Limit States Design.
  3. CSA Standard W59, "Welded Steel Construction" (Metal Arc Welding).
  4. CSA Standard W.55.2, "Resistance Welding Practice."
  5. CSA Standard W55.3, "Resistance Welding Qualification Code for Fabricators of Structural Members Used in Buildings."
  6. CSA Standard W.47, "Certification of Companies for Fusion Welding of Steel Structures."
  7. CSA Standard S.136, "Cold Formed Steel Structural Members".
  8. Ontario Building Code.
4. Certificates:
  1. Provide a certificate signed and sealed by the licensed/registered professional engineer responsible for the stair designs and the detailed steel connections (including guards) stating that the stairs and connections have been designed, detailed and fabricated in accordance with the applicable standards.
  2. Certification must bear the original seal and signature of the engineer and be dated. Photocopies are not acceptable.
5. Clearly indicate construction details, sizes of steel sections, thickness or gauge of steel sheet, connections, joints, method of anchorage, number of anchors, supports, reinforcement and accessories. Confirm all dimensions on site.

3. STANDARDS

1. Materials and workmanship shall conform to the requirements of the Latest Ontario Building Code, as currently amended.
2. Do welding work to CSA W59, unless specified otherwise. Welders to qualify under CSA W47, CSA 55.2 and CSA W55.3.
3. Design of steel fabrications, unit stresses and workmanship to conform to CSA CAN3-S16 1-M.

4. DESIGN CRITERIA

1. Design stair: landing construction; guards and railings and connections to conform to the Ontario Building Code.
2. Design detail and fabricate in general to CSA CAN3-S16 1-M.

5. QUALITY ASSURANCE

1. WELDING APPLICABLE STANDARDS:

1. CSA Standard W59, "Welded Steel Construction" (Metal Arc Welding).
2. CSA Standard W.55.2, "Resistance Welding Practice."
3. CSA Standard W55.3, "Resistance Welding Qualification Code for Fabricators of Structural Members Used in Buildings."
4. CSA Standard W.47, "Certification of Companies for Fusion Welding of Steel Structures."

2. QUALITY ASSURANCE

1. Fabrication and erection of all components to be by companies holding current C.W.B. Certification as Division 1 or Division 2.1. All welding by welders holding current certification for the required welding position.

6. SCOPE

1. Supply and install interior and exterior steel handrails.
2. Provide all miscellaneous metals (incl. stainless steel and aluminum) items as detailed and noted under other sections.
3. Provide all additional miscellaneous steel items as required to complete the above work.

**2. PRODUCTS**

1. MATERIALS

1. Ferrous Metals:

1. Unless otherwise indicated, hot rolled mild steel in .15% to .25% carbon range.
2. Steel sections and plate: CSA G40.21-/M1987, minimum 260W grade.
3. Square steel tube: CSA G40.21-/M1987, Grade 350W.
4. Steel pipe: ASTM A53-76, Type E, Grade A.
5. Sheet Steel: hot dip galvanized, cold rolled, with stretcher level degree of flatness to ASTM A526; zinc coating designation Z275.

2. Aluminum: CSA HA Series - M1980 for aluminum and aluminum alloys, Alcan 50S Alloy.

3. Prime Paint: Oil alkyd type (shop coat) conforming to CGSB-1-GP-40M. Colour to be grey.

4. Expansion Joints: as specified.

5. Welding Materials: CSA W59-1984.

6. Bituminous Enamel: Alkali resistant asphaltic coating conforming to CGSB1-GP-108M.

7. Non-shrink Grout: Por-Rok by Hallemite Products Ltd., or SET 15 Minute Anchoring Cement by SET Products Ltd.

8. Galvanized Touch-Up Paint: Zinc rich, Galvafruid by W.R. Meddows of Canada Ltd. or approved equal.

9. Hot Dipped Galvanizing: conform to CSA G164-M1981.

10. Bolts and Anchor Bolts: to ASTM A307-82a.

11. Stainless Steel:

1. To have brushed finish, Type 304 finish to be ornamental grade AISI No.4.

2. FABRICATION - GENERAL

1. Fabricate components in the shop in largest size practicable to minimize field jointing.

2. Fabricate components square, straight, true, free from warpage and other defects. Accurately cut, machine file and fit joints, corners, copes and mitres.
3. Reinforce fabricated components to safely withstand expected loads.
4. Make joints in built-up sections with hairline joints in least conspicuous locations and manner.
5. Make allowance for thermal expansion and contraction when fabricating exterior work.
6. Joints shall be welded unless otherwise indicated and unless details of construction do not permit welding. Exposed welds shall be continuous and shall be ground smooth.
7. Close exposed open ends of tubular members with welded on steel plugs.
8. Where work of other Sections is to be attached to work of this section, prepare work by drilling and tapping holes, as required to facilitate installation of such other work.
9. Work of this Section, supplied for installation under other Sections, shall be prepared as required ready for installation by: drilling, countersinking and tapping holes, forming shapes and cutting to required sizes.
10. Grind off mill stampings and fill recessed markings on steel components left exposed to view.
11. Make workmanship of best grade of modern shop and field practice known to recognized manufacturers specializing in this work. Fit joints and intersecting members accurately. Make work in true plumb, true, square, straight, level and accurate to sizes and shapes detailed, free from distortion or defects detrimental to appearance or performance.
12. Insulate metals where necessary to prevent corrosion due to contact between dissimilar metals and between metals and masonry, concrete or plaster. Use bituminous paint, butyl tape, building paper or other approved means.
13. Supply all fastenings, anchors and accessories required for fabrication and erection of the work. Make exposed metal fastenings and accessories of same material, texture, colour and finish as base metal on which they occur unless otherwise shown or specified. Keep exposed fastenings to an absolute minimum and inconspicuous, spacing them evenly and setting them out neatly. Make fastenings of permanent type.
14. Draw mechanical joints to hairline tightness and seal countersunk screws and access holes for locking screws with metal filler where these occur on exposed surface.

5. FINISHES

1. Thoroughly clean steel of loose scale, rust, oil, dirt and other foreign matter. Suitably prepare steel surfaces by power tool cleaning to receive specified finishes.
2. Grind smooth sharp projections.
3. Remove oil and grease by solvent cleaning.
4. Apply coatings in the shop and before assembly. Where size permits, galvanize components after assembly.
5. Shop apply coat of primer to interior components after fabrication except where galvanized finish and stainless steel is required.
6. Hot dip galvanize exterior components and other components, where so indicated, after fabrication in accord with requirements of CSA Standard G164-M1981.
7. Apply coat of bituminous enamel to contact surfaces of metal components in contact with cementitious materials and dissimilar metals.
8. After erection and installation, thoroughly clean the work and apply field touch up of same formula as shop coat to all damaged or unpainted surfaces. Work all paint well into all joints, crevices and open spaces.

5. MISCELLANEOUS STEEL SECTIONS

1. Supply all miscellaneous steel angles, plates, lintels, etc., indicated on the architectural drawings & not indicated on the structural drawings or noted on the structural drawings by others. Size according to loads, set plumb and true and securely fix. Continuously weld and grind smooth exposed connections. Others may be welded or bolted.

**3. EXECUTION**

1. INSTALLATION

1. Install components plumb, square, straight and true to line. Drill, cut and fit as necessary to attach this work to adjoining work.
2. Provide temporary supports and bracing required to position components until they are permanently anchored in place.
3. Securely anchor components in place; unless otherwise indicated, anchor components as follows:
  1. To concrete and solid masonry with expansion shields and bolts.
  2. To hollow construction with toggle bolts.

3. To thin metal with screws or bolts.
  4. To thick metal with bolts or by welding.
  5. Fill space between railing members and sleeves with non-shrink grout.
  6. To wood with bolts or lag screws.
4. Provide all components required for anchoring. Make anchoring in concealed manner wherever possible. Make exposed fastenings, where approved by Architect neatly and of same material, colour, texture and finish as base metal on which they occur. Keep exposed fastenings evenly spaced.
  5. Dissimilar metals and metals in contact with cementitious elements shall have contact surfaces coated with bituminous paint or be isolated by other means as approved by Architect.
  6. After installation, clean and refinish injured finishes, welds, bolt heads and nuts. Refinish with zinc rich paint or primer to match original finish.

## 2. HANDRAILS

1. Unless shown otherwise on drawings or in this Section, handrails shall be as follows:
  1. General:
    1. Construct rails of standard steel pipe of sizes indicated on drawings.
    2. Where not indicated, pipe handrails to be 1 ½" (38 mm) O.D.
    3. Joints and intersecting members welded and ground smooth. Where rails return to walls or other vertical faces, cut off and grind smooth ¼" (6 mm) from vertical face. See drawings for details.
  2. Install brackets in best standard practice, space not more than 4'-0" (1200 mm) o.c. for wall handrails. Brackets shall be as shown on drawings. Mount handrailing to height shown on drawings.
  3. Where handrails and top rail on guard are shown on drawings as not galvanized or stainless steel, such railings shall be shop primed for painting. Painting to be done under Section 09900.
  4. Supply and install handrails and balustrades to safely support a horizontal load of 103 lb/lin. ft. (1.5 kN/m) applied at the top of the rail.

5. Supply and install stainless steel handrail, top rail on guard and as per latest O.B.C.s requirements, Type 304 with ornamental grade A.I.S.I. No. 4 finish where stainless steel is indicated on drawings.
6. See Section 08800 glass and glazing and 08810 glass balustrades for glazing and handrails at stairs with glass.

3. MISCELLANEOUS ITEMS, STEEL BRACKETS SUPPORTS AND ANGLES

1. Supply for installation by respective trades, steel brackets, supports, and angles as indicated on drawings. Drill for countersunk screws and anchor bolts. Prime paint for interior, galvanize for exterior.
2. Provide support brackets for vanities and counters, cabinets and storage units as indicated. These items are part of the allowance of miscellaneous items supplied to the millwork contractor.
3. Provide hot-dipped galvanized Roof Top Unit support posts and beams as required by manufacturer.
4. Provide 8" min. D. hoist steel beam as requested by Elevator manufacturer.
5. Provide steel miscellaneous angles and hanger rods as indicated.
6. Provide other metal fabrications which are not a part of a manufactured item or covered under another section in Division 5. Refer to drawings.

4. CAVITY CLOSURES AND COMPARTMENT CONTROL JOINTS

1. Cavity Closures: 12 gauge 304 stainless steel with 2B finish cold rolled formed to suit continuous bent closure profile:
  - around all window and curtain wall openings;
  - around all door openings,
  - around all other misc. openings through exterior cavity wall
  - at expansion joints and control jointsClosure(s) to have minimum dimensions to meet or exceed cavity wall insulation thickness / depth on both flanges. Do not over exceed insulation and air space cavity dimensions as to block off drainage and air space, this is to remain free of infill to breathe and drain.

**END OF SECTION**

**1. GENERAL**

1. GENERAL REQUIREMENTS

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

2. REFERENCE STANDARDS

1. Standard of finished carpentry, metal work and cabinet work in accordance with the "Architectural Millwork Standards" of the Architectural Woodwork Manufacturers Association of Canada (AWMAC).

3. QUALIFICATIONS

1. The work of this trade shall be executed by a company having a minimum of 5 years proven first class experience in this type of work and having adequate equipment and skilled personnel. Refer to Instructions to Bidders for list of Prequalified Trades.

4. SHOP DRAWINGS

1. Submit Shop Drawings in electronic PDF format in accordance with GC.3.10 of CCDC Document 2 - 2020.
2. Before Shop Drawings and fabrication are started, take critical measurements at the site to facilitate installation and fitting of work.
3. Design Criteria - Applicable Standards:
  1. All standards in accordance with latest issue.
  2. Ontario Building Code
4. Clearly indicate construction details, sizes and wood and steel sections, thickness or gauge of wood and steel sheet, connections, joints, method of anchorage, number or anchors, supports, reinforcement and accessories. Confirm all dimensions on site.

5. DELIVERY AND STORAGE

1. Give Painter sufficient notice so that untreated or unpainted carpentry items or materials can be primed immediately upon delivery to site.
2. No equipment shall be delivered to the site until a portion of the building in which it is to be installed is completely ready for equipment as approved by the Architect.
3. Store finished work properly and keep under cover both in transit and at

site. Finish woodwork shall not be delivered to site until concrete and masonry work has dried out.

4. Check access clearance at site before assembling.

6. SAMPLES

1. Submit samples of construction methods and all hardware.

7. WARRANTY

1. The warranty period stipulated in the General Conditions of the Contract shall be extended five (5) years in writing against defects.

8. MOISTURE CONTENT

1. Finish material to be dried to a uniform maximum moisture content of 12% for exterior work and 6% to 8% for interior work.

2. **PRODUCTS**

1. MATERIALS

1. Materials used for finish work shall be sound, free from defects that would mar finished appearance, well seasoned and air dried and of good quality for intended purposes. Wood laminates pressure bonded.
2. Plywoods: shall be rift cut or quarter sawn Oak architectural grade "AA" No. 1 Face Grade and shall comply to C.S.A. 0115-M1982, with plywood core, laminated with waterproof adhesive. Plywood shall be good both sides.
3. Framing Lumber - No. 2 or better spruce, pine or fir best mercantile lumber.
4. Penetrating Sealer - "Penetrim" by Tremco Mfg. Co. (Canada) Ltd., or "1402" by MacNaughton Brooks Ltd.
5. Adhesive: As recommended by manufacturer for required application and to conform to C.S.A. 0121-M1978.
6. Nails, Spikes and Staples: To C.S.A. B111-1974, plain finish nails. Use spiral thread nails and barbed staples.
7. Exposed fasteners: All exposed fasteners to be stainless steel. At exposed screw locations use stainless steel screws and cup washers.
8. Refer to drawings and details for complete list of materials to be installed.

**3. EXECUTION**

1. WORKMANSHIP

1. Work shall be executed by mechanics skilled in their respective trade, according to best practice, or specified herein and indicated on drawings.
2. Check job dimensions and conditions and notify the Architect in writing of unacceptable conditions. Do not proceed until remedial instructions are received. Commencement of work will imply acceptance of site conditions and re-working or modification of the work as deemed necessary by the Architect will be done at no extra cost to the Owner.
3. As far as practical, assemble work at the shop and deliver to the job ready for installation. Leave ample allowance for fitting and scribing on the job.
4. Fabricate work square and to the required lines.
5. Lay out work carefully as indicated and to accommodate work of other trades. Accurately cut and fit; erect in proper position true to dimensions. Align, level, square, plumb, adequately brace, and secure permanently in place.
6. Use treated lumber for studs, blocking nailers, furring and other wood permanently installed in building. Brush coat freshly cut ends with two coats of concentrated form of preservative.
7. Recess and conceal fasteners and anchor heads. Fill with matching wood plugs. Set nail heads and fasteners occurring within exposed interior carpentry work.
8. Provide wood members free from bruises, blemishes, mineral marks, knots, shake and other defects and select for uniform colour grain and texture. Machine and hand sand surfaces exposed in the finished work to an even, smooth surface free from defects detrimental to appearance.
9. Provide running members in the maximum lengths obtainable. Provide thickness of members in maximum dressed size of standard lumber. Where thickness of width indicated is not available in hardwoods, use glue laminations to obtain sizes required. Provide unexposed backs of veneers having the same physical characteristics as the face veneer.
10. Give painter sufficient notice so that untreated or unprimed carpentry items or materials can be primed immediately upon delivery to site. No exposed end grain of plywood shall be permitted; edging shall be solid 3/8" (10 mm) wide by thickness of plywood and of same species of wood. Finger jointed edging will not be accepted.

11. Co-operate with others engaged in work on the building to the end that proper unity of action will assure the orderly progress of the work. Do necessary boxing and protecting of sills, jambs, corners and the like. Construct scaffold, ramps, and other temporary staging necessary.
  12. Chamfer edges of plastic laminate to avoid chipping.
2. WOOD DOOR INSTALLATION.
    1. Fit wood doors to frame by dressing off hinge edge before applying butts. Provide 3/32" (2.5 mm) clearance at jambs and heads. Mount so as to swing easily and freely on their hinges and close accurately against the stops on the frames without binding. Latch bolts shall engage positively with the strikes or catches when the doors are slammed shut or closed with moderate force. Doors shall remain stationary in every position without independent motion.
3. WOOD DOOR HARDWARE INSTALLATION
    1. Install finishing hardware supplied under Section 08700 on wood doors.
    2. Installation is to be performed by a certified hardware installer.
    3. Complete preparation of wood doors for all hardware including mortise type latch sets.
    4. As per Section 08700, hardware supplier shall check all hardware for proper operation when it has been installed and shall notify the Architect of any cases where it has not been properly installed, is defective, or is not as specified.
4. HOLLOW METAL DOOR AND FINISH DOOR HARDWARE FOR HOLLOW METAL DOORS INSTALLATION
    1. Install/hang all hollow metal doors. Install as specified in Section 08110.
    2. Install all finish door hardware.
5. INSTALLATION
    1. Deliver Finish Carpentry to the site. Provide units of such sizes as will not present difficulty of entry to the place of installation. Where units are shipped in knock-down forms, provide clear instructions for assembly.
    2. Install Finish Carpentry items plumb, square, true, rigid and secure with concealed fastening at exposed areas and with stainless steel screws and cup washers where secured inside of millwork units.

**END OF SECTION**

**1. GENERAL**

1. GENERAL REQUIREMENTS

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

**2. PRODUCTS**

2.1 INSULATION

- .1 Batt and Blanket Mineral Fibre Insulation (Exterior Wall Systems (Stud Cavity)):  
Roxul ComfortBatt mineral wool semi-rigid batt insulation with flexible edge. Thickness is to fill wall cavity solid unless specified / shown otherwise on wall types.  
  
Typical thicknesses of 92mm – R14.5 and 140mm - R22.5  
(Take into account wall cavity thickness for different R-Value)
- .2 Acoustic Sound Batt Insulation (Interior Wall Systems (Stud Cavity) & Sound Proofing Above Ceilings):
  1. Roxul Acoustical Fire Batt (AFB) mineral wool insulation for fire rated assemblies and Roxul Safe 'n' Sound for non-fire-rated assemblies. Thickness is to fill wall cavity solid unless specified / shown otherwise on wall types.
  2. Rockboard 60 with foil face (facing upward into plenum) at sound rated ceiling systems where ceiling spaces are used for plenums.
- .3 Curtain Wall Insulated Panel:  
Roxul Curtain Rock mineral fibre insulation with 'R' value of 4.2 per inch.  
152 curtain wall framing to receive 100mm (4") thick insulation with single glazed spandrel, 75mm (3") thick insulation with double insulated spandrel;  
190mm curtain wall framing to receive 127mm (5") thick insulation with single glazed spandrel, 114mm (4.5") thick insulation with double insulated spandrel.  
Other conditions such as different size curtain wall framing systems create different size sealed metal backpans. The insulation is to fill the entire void of the sealed metal backpan with 25mm (1") spacing off the back side of the spandrel panel if required from the glazing supplier, if not required an additional 25mm (1") insulation is to be installed in all curtain wall sizing.
- .4 Floor Slab Edges / Termination:  
Roxul Safe mineral fibre insulation to be installed at edge of floor slab / slab termination to back side of vertical curtain plane to fill the remaining installation / deflection void to maintain fire resistance rating of the floor system. Install finish floor cap over & under to hold in place.
- .5 Above Grade Cavity Wall Locations (Over exterior sheathing, over masonry or concrete wall substrate and on framed wall substrate systems (where exterior cladding strapping / anchorage is applied to the face of

the wall substrate):

Roxul CavityRock mineral fibre insulation with 'R' value of 4.2 per inch. to be installed with manufacturer recommended fasteners. Thickness as shown on wall types or otherwise indicated on drawings.

- .6 Above Grade Cavity Wall Locations (Over exterior sheathing, over masonry or concrete wall substrate and on framed substrate systems (where exterior cladding strapping / anchorage is applied to the face of the insulation and not the wall substrate):

Roxul Comfortboard mineral fibre insulation with 'R' value of 4.2 per inch. to be installed with manufacturer recommended fasteners. Thickness as shown on wall types or otherwise indicated on drawings.

## 2.2 ACCESSORIES

- .1 Staples: ½" (13 mm) minimum leg.

## 3. EXECUTION

### 3.1 INSULATION INSTALLATION

- .1 Install insulation to maintain continuity of thermal protection to building elements and spaces. Insulation to be friction fit between studs, joists or furring members.
- .2 Fit insulation closely around electrical boxes, pipes, ducts, frames and other objects in or passing through insulation.
- .3 Do not compress insulation to fit into spaces.
- .4 Do not install insulation in any part of the building where protection against inclement weather has not yet been provided and where the insulation could thereby be wet or damaged.
- .5 Provide and install supports as required to keep insulation in place at soffits with floor above and around ducts in attic space.
- .6 Keep insulation a min. 3" (75 mm) from heat emitting devices such as recessed light fixtures.

### 3.2 LOOSE FIBRE INSULATION

- .1 Pack loose mineral wool insulation in crevices around lintels, frames, beams, around ducts at holes and other places where shown or required to minimize air infiltration.
- .2 Pack loose mineral wool into voids around mechanical and electrical pipes and ducts where they pass through non-fire rated wall, floors and ceilings.

### 3.3 FIRE RATED MINERAL WOOL INSULATION

- .1 Supply and install mineral wool at fire separations and where indicated on drawings.

- .2 Refer to Section 07270 Firestopping and Smoke Seals for mineral wool work by that Section.

3.4 SOUND INSULATION

- .1 Fill all cavities full of mineral wool sound insulation where sound insulation is indicated on drawings.
- .2 Sound insulation above acoustic tile ceilings supplied and installed by Section 09500 as per this Section.

3.5 BATT INSULATION

- .1 Install mineral wool batt insulation at exterior or air/vapour barrier walls, ceiling spaces, between floor joists at perimeter wall locations and all other locations shown on drawings.
- .2 Place batts in close contact with vapour barrier or air/vapour barrier facing the interior.

**End of Section**

1. GENERAL

1. GENERAL REQUIREMENTS

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

2. RELATED WORK

1. Concrete - Section 03300
2. Masonry - Section 04200
3. Miscellaneous Metals - Section 05500
4. Hollow Metal Doors & Frames - Section 08110
5. Aluminum Entry Doors – Section 08400
6. Glass and Glazing - Section 08800
7. Gypsum Wallboard - Section 09250
8. Painting - Section 09900
9. Manufactured Specialties - Section 10950
10. Mechanical - Division 15
11. Electrical - Division 16

3. SYSTEM DESCRIPTION

1. Supply all labour, materials and equipment necessary for the complete work of this Section as indicated on the drawings, specified herein, or as required by job conditions and normally considered as work covered by this Section.
2. The term "sealant" to be synonymous with the term "caulking" where used on the drawings and/or specifications.

4. SUBMISSIONS

1. Submit complete colour samples for Architect's approval.
2. Supply a sample container of each type of caulking or sealant.
3. Sample joints of each type and colour of caulking shall be prepared at the site in a location directed by the Architect and be approved by the Architect before work commences. Approved joints will represent minimum acceptable for the work.
4. Cure samples and under conditions anticipated at job site during construction.

5. ENVIRONMENTAL CONDITIONS

1. Sealant and substrata materials to be minimum 5 C (41 deg. F.).
2. If necessary to apply sealants below 5 C., consult sealant manufacturer and follow their recommendations.

6. DELIVERY AND STORAGE

1. Deliver and store materials in manufacturer's original wrappings and containers.

7. PROTECTION

1. Mask adjacent surfaces as necessary to prevent contamination.
2. Protect all sealant against puncture or damage until sealant has attained its final set.
3. Be responsible for any damage to adjacent surfaces caused by the work of this Section. Provide extra protection as required when sandblasting.
4. Provide temporary covers over joints where joints have been cleaned out, but not yet caulked.

8. WARRANTY

1. Provide a written warranty, signed and issued in the name of the Owner stating that caulking work of this section is guaranteed against leakage, cracking, crumbling, melting, shrinkage, running, loss of adhesion, or staining adjacent surfaces, for a period of five years from the date of Substantial Certificate of Completion and that any defective caulking will be replaced.
2. At completion of the work, provide a written statement from the manufacturer or authorized manufacturer's representative that material used in the various applications is the recommended one and that the final application is as recommended by the manufacturer for the construction conditions detailed and for the performance required. These requirements are applicable to every material included in the work of this Section.

9. QUALIFICATIONS

1. Applicator for the work of this section shall:
  1. Be approved by the materials manufacturer and Architects.
  2. Have at least five years proven satisfactory experience in this type of work.
  3. Have adequate equipment and skilled personnel to expediently complete the work of this section in an efficient and very best workmanlike manner.
  4. Be completely familiar with the published recommendations of the manufacturer of the caulking material being used.
2. Indication of lack of skill or defective work to be sufficient grounds for the Consultant to reject the installed caulking and to require its immediate removal and complete recaulking at no additional cost to the Owner during the guaranty period.
3. Co-operate with the Consultant and/or any inspection and testing agency he may appoint.
4. Materials to be utilized shall be inspected and tested as required.
5. Provide cut tests of 6 inches in length in order to ensure correct thickness, hardness, mixing and surface finish. Provide these cut test samples at times and from locations as directed by the Consultant, and make good the areas from which the samples are taken.
6. All tests of the sealant installation shall be inspected by the sealant manufacturer's

representative.

## 2. PRODUCTS

### 1. MATERIALS

1. Primers: type recommended by sealant manufacturer.
2. Joint Fillers:
  1. General: compatible with primers and sealants, oversized 30 to 50%.
  2. Polyethylene: extruded closed cell foam, Shore A hardness 20, tensile strength 140 to 200 kPa.
3. Bond Breaker: pressure sensitive plastic tape, which will not bond to sealants.
4. Sealant Type A: Equal three part polyurethane 'Tremco Dymeric 240' conforming to C.G.S.B. CAN2-19-24-M80. Colours to be tinted to specifically match wall colours. Maximum of five colours.
5. Sealant Type B: One part silicone mildew resistant type equal to sanitary sealant 1702 by C.G.E. Silicones and conforming to CGSB 19-GP-22m or Dow Corning 786.
6. Sealant Type C: Equal to Sikaflex - 15 LM. Colours to be tinted to specifically match wall colours. Maximum of six colours.
7. Colour of Sealants: to be selected by the Architect. Colours of sealant to change where wall colours change (i.e. banding).
8. Joint Cleaner: xylol, methylethyleketon or non-corrosive type recommended by sealant manufacturer and compatible with joint forming materials.
9. Vent Tubing: 6 mm (1/4") inside diameter extruded polyvinyl chloride tubing.
10. Threshold Bedding: oil base caulking compound, to CGSB 19-GP-6.
11. Deliver materials to job site in sealed containers with manufacturer's original labels attached, and accompanied by certification of compliance with the specifications.

## 3. EXECUTION

### 1. EXAMINATION

1. Examine all surfaces prior to application and notify the Architect of any conditions detrimental to satisfactory application.
2. Commencement of work shall imply acceptance of surfaces.

### 2. PREPARATION

1. Use a dry, clean, oil free compressed air stream to remove dust and other contaminants. Masonry surfaces shall be cleaned with wire brush and then blown clean. Any waterproofing treatments contaminating the joint must be completely

removed.

2. Remove rust, mill scale and coatings from ferrous metals by wire brush, grinding or sandblasting.
3. Remove oil, grease and other coatings from non-ferrous metals with joint cleaner.
4. Prepare concrete, masonry, glazed and vitreous surfaces to sealant manufacturer's instructions.
5. Examine joint sizes and correct to achieve depth ratio  $\frac{1}{2}$  of joint width with minimum width and depth of 6 mm ( $\frac{1}{4}$ " ), maximum width 25 mm (1").
6. Before caulking, fill spaces deeper than 13 mm ( $\frac{1}{2}$ " ) with bedding material, packed tightly in place and set below finished surfaces to suit specified sealant depth. Provide joints less than 13 mm ( $\frac{1}{2}$ " ) deep with an approved joint breaker.
7. Where necessary to prevent staining, mask adjacent surfaces with tape prior to priming and caulking.
8. Apply bond breaker tape where required to manufacturer's directions.
9. Prime sides of joints to sealant manufacturer's instructions immediately prior to caulking.
10. Remove all existing caulking and prepare for replacement.
11. Check form release agent used on concrete for compatibility with sealant and primer. If they are incompatible inform Consultant and change sealant to compatible type approved by Consultant or clean concrete to Architect's approval.

### 3. APPLICATION

1. Before application of any sealants, confirm that sealant material is compatible with the materials and finishes of the surfaces to which the material is applied or is in contact with.
2. Apply sealants, primers, joint fillers, bond breakers, to manufacturer's instructions. Apply sealant using a gun with proper size nozzle. Use sufficient pressure to fill voids and joints solid. Superficial pointing with skin bead is not acceptable.
3. Thoroughly mix caulking materials with a mechanical mixer capable of mixing at 80-100 rpm without mixing air into the material. Mix material in accordance with the manufacturer's directions and instructions.
4. Install caulking to the joints using manually operated or power operated guns. Use nozzles of the correct size and shape and provide sufficient pressure to completely fill the joints and make adhesive contact with the backs and sides of the joints. Caulk solidly around entire perimeter of openings.
5. Finish the surface of the caulking with a smooth, full bead, free from ridges, wrinkles, sags, air pockets and embedded impurities. Tool the finish bead with a water wet or dry tool as recommended by the manufacturer, to a slightly concave joint.

6. In masonry cavity construction, vent caulked joints from cavity to 3 mm (1/8") beyond external face of wall by inserting vent tubing at bottom of each joint and maximum of 1500 mm (5'-0") o.c. vertically. Position tube to drain to exterior.
7. Clean adjacent surfaces immediately and leave work neat and clean. Remove excess sealant and droppings using recommended cleaners as work progresses. Remove masking after tooling of joints. Finish work damaged due to this work shall be replaced at this contractor's expense to satisfaction of the Architect.
8. Set thresholds in a full bed of caulking compound at least 1/2" (12 mm) thick. Remove excess compound after threshold is set and neatly point joints.
9. All hidden joints or joints concealed by metal covers occurring in window and door frames, metal curtainwalls, other locations, to be clean, sealant applied and tooled, and inspected and approved prior to the installation of metal covers.
10. Use of sealants specified in the following locations:
  1. Type A: Use at all exterior locations and interior control joints and expansion joints. NOTE: this sealant **must not be** painted over.
  2. Type B: Joints between flooring (except carpet areas) and door frames; between countertops and walls; all high humidity locations at shower and changeroom locations.
  3. Type C: At all remaining interior locations.

4. LOCATIONS

1. Do all caulking required (except where specified under other sections).
2. Caulk exposed control joints and expansion joints occurring in masonry and concrete walls. (See item 3.6)
3. Caulk along underside of projecting flashings, except at roof eave detail.
4. Caulk joints between aluminum panels, window or door frames to adjacent building components around perimeter of every external window or door opening at interior and exterior sides aluminum units which work shall be performed by Automatic Aluminum Doors - Section 08710, Aluminum Window Section 08520, and Section 07461 Aluminum Architectural Panel System, Aluminum Curtain Wall - Section 08900.
5. Caulk around exterior louvres.
6. Set window sills in a bed of caulking compound by Sections 08400 and 08900.
7. Interior hollow metal where it abuts interior finishes.
8. Caulk where shown on drawings and not specified in other sections.
9. Caulk joints at junction of different materials and junction of surfaces in different

planes as required or directed (i.e. concrete to metal, concrete to masonry, masonry to metal, masonry to drywall, etc.).

10. Caulking elsewhere to provide a water and weatherproof condition.
11. Caulk areas on interior walls to stop air infiltration.
12. Caulking between resilient/sheet flooring and masonry or concrete walls; and between resilient/sheet flooring and hollow metal frames (Type 'B' sealant).
13. Caulk joints between masonry and gypsum wallboard or plaster.
14. Caulk control joints in drywall partitions.
15. Caulk around access panels, built-in specialties, grilles, pipes, ducts, conduit, outlet boxes, etc. penetrating floors, walls and ceilings.
16. Caulk joints around metal items projecting from ceramic tile work (Type "B" sealant).
17. Caulk around toilets, urinals, sinks, bathtubs, showers, etc. at junction with floor and wall surfaces (Type "B" sealant).
18. Caulk joints as required to provide soundproofing where soundproofing walls are indicated.
19. Caulk joints between wood window and wall surfaces and wood door frames and wall surfaces, etc.
20. Caulk perimeter of all countertops and window plastic laminate sills (including underside) with (Type "B" sealant).
21. Caulk around access panels and washroom accessories in ceramic tile faced walls.

5. CAULKING NOT TO BE DONE UNDER THIS SECTION

1. Caulking of Sidewalk Joints - Section 02600
2. Firestopping and smoke seals - Section 07270, Div. 15 and Div. 16
3. Caulking between aluminum work and aluminum work to surrounding surface - Section 07461, Section 08716, and Section 08520.
4. Caulking of Roofing - Section 07500
5. Caulking of Metal Flashings - Section 07620
6. Caulking of Vapour Barrier - Section 07910
7. Caulking and sealants for glazing - Section 08800
8. Caulking of Acoustic Drywall Partitions - Section 09250
9. Caulking of Ceramic and Quarry Tile - Section 09300

10. Caulking of sheet flooring - Section 09624

6. CAULKING OF MASONRY CONTROL JOINTS

1. Caulk all Masonry Control Joints where shown on drawings. Refer to exterior elevations and interior elevations.

NOTE: For Base Price at each control joint shown on exterior wall elevation allow for control joint to also be located in back up masonry concrete block wall as per AD detail, backer rod and Caulking by this Section. Compressible joint filler by Masonry Section 04200.

2. In addition to locations noted in item a. above, allow for the following additional linear quantities for Caulking of interior concrete block control joints, as per drawings as follows:

.1 3500 lineal metres of caulking complete with backer rod.

NOTE: Linear quantity based on one side/face of exposed concrete block masonry wall.

NOTE: Verification of linear quantities of control joints to be made later. Locations of all additional required Concrete Block Joints to be finalized later after submission of proposed control joint locations on shop drawings to be submitted by Masonry Contractor as required by Specifications Section 04200.

**End of Section**

**1. GENERAL**

1. GENERAL REQUIREMENTS

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

2. SHOP DRAWINGS

1. Submit shop drawings in electronic PDF format in accordance with GC 3.10 of CCDC Document 2, 2020 and Section 01300 – Submittals.
2. Indicate each type frame material, core thickness, reinforcements, glazing stops, location of anchors and exposed fastenings, finishes and fire ratings.
3. Fire Ratings indicated on Door Finish Schedule are minimums. If door design cannot be satisfied at specified rating (i.e. 20 min), supply door or frame with acceptable higher rating (i.e. 45 min.).

3. QUALIFICATIONS OF MANUFACTURER

1. Products used in the Work of this Section shall be produced by manufacturers regularly engaged in manufacture of similar items and with a history of successful production acceptable to the Architect.
2. Only steel hollow metal doors and frames manufactured by members of the Canadian Steel Door and Frame Manufacturer's Association (CSDFMA) are eligible for use on this project.
3. Qualified Manufacturers:
  1. S. W. Fleming
  2. Baron
  3. Daybar
  4. Artek
  5. Trillium
  6. Vision Hollow Metal
4. All other manufacturers to submit for approval a minimum seven (7) days prior to tender closing.

4. PROTECTION

1. Use all means necessary to protect materials of this Section before, during and after installation and to protect installed work & materials of all other trades.

5. REPLACEMENTS

1. In the event of damage, immediately make all repairs & replacements

necessary to the approval of the Architect and at no additional cost to the Owner.

6. WORK INCLUDED

1. Supply all hollow metal doors, frames and screens as shown on drawings and on door schedule.
  1. Provide removable mullions where indicated. Refer to door and frame schedule.
2. Supply and install all hollow metal fire doors, frames and screens shown on the drawings and on door schedule.
  1. Door cutouts, complete with reinforcing, stops, and closures required for glazing.
  2. Cut outs and reinforcing for finishing hardware including preparations for mortice type hardware.
  3. Cutouts for security system. Coordinate with Div.16.
3. Supply all necessary fastening and anchoring devices for above items.
4. Supply and install door grilles where indicated on drawings or sizes as indicated on the drawings. Refer also to Div.15.

7. STANDARDS

1. Materials and workmanship to be in accordance with Canadian Steel Door and Frame Manufacturer's Association Specifications Standards for steel doors and frames.

8. REGULATORY REQUIREMENTS

1. Supply fire labelled steel doors and frames in accordance with NFPA-80, current edition, except where specified otherwise.

**2. PRODUCTS**

1. MATERIALS

Steel: cold rolled steel, double annealed patent levelled, fully pickled and free from scale and internal defect. Surfaces shall be free from perceptible waves, buckles and other imperfections.

1. Zinc Coating: wipe coated galvanizing in conformance with ASTM 527, Coating Class A01.
2. Primer for Touch-Up: conforming to CGSB 1GP-181M.

3. Labels: Provide ULC or Warnock-Hersey Labels for doors and frames as per Door Schedule.
4. Thermal Break: Polyvinyl Chloride (PVC) thermal break.
5. Reinforcing Channel: to CAN/CSA - G40.21-M7, grade 300W, 3.25 mm.
6. Glass for Hollow Metal Doors: as per 08800 Glass and Glazing Section.
7. Glass for Hollow Metal Frames and Screens: as per 08800 Glass and Glazing Section.

## 2. FABRICATION

### 1. Generally

1. Fit and assemble work in shop where possible. Execute according to details and approved shop drawings. Where shop fabrication is not possible, make trial assembly in shop.
2. Weld all components of doors and frames. File or grind exposed welds smooth and flush. Exposed welds shall be continuous. Knock-down frame not to be used on this project.
3. Workmanship shall be best grade modern shop and field practice known to recognized manufacturers specializing in this work. Joints and intersecting members accurately fitted made in true planes with adequate fastening.
4. Insulate where necessary to prevent electrolysis between metal to metal or metal to masonry or concrete.
5. Fabricate and erect work square, plumb, straight, true and accurately fitted. Provide adequate reinforcing and anchorage.
6. Clean, scrape and remove rust, mill scale, grease or extraneous material from frames and doors following fabrication. Flood coat with air-drying paste filler and again sand to eliminate all unevenness or irregularities. Apply in shop a full smooth coat of zinc chromate primer to all surfaces. Deliver work to site with primer undamaged and otherwise satisfactory for following work specified in Section 09900.

### 2. Doors

1. Provide hollow metal doors of type and size indicated on Door Schedule, and as detailed on Drawings.
2. Construct flush type continuously welded exterior doors conforming

to ASTM A527 16 gauge (1.613 mm) hollow metal construction, steel stiffened with vertical steel ribs, all voids filled with semi-rigid fibrous insulation minimum density 24 kg/m<sup>3</sup> polystyrene polyurethane and complete with top and bottom caps. Finish shall be "wipe coat" galvanized steel.

3. Construct interior slab and stile and rail type doors and panels of 18 gauge (1.311 mm) cold rolled, roller levelled sheet "wipecoat" galvanized steel with honeycomb structural core consisting of pre-expanded, resin impregnated Kraft paper having 3/4" (20 mm) cell size to thickness indicated.
  4. Provide 16 gauge (1.613 mm) continuously welded interior doors, reinforced with interior stiffeners at all corridor, washrooms, change rooms and Gymnasium and elsewhere where indicated on drawings and Door Schedule. Interior Stiffeners: for steel doors and panels, spot weld interior stiffeners at 150 mm (6") o.c. maximum to face sheets. Laterally stiffen steel doors at top and bottom by continuous channels securely welded to both face sheets.
  5. Doors shall be mortised, reinforced, drilled and tapped to receive templated hardware including mortise type hardware. Reinforce for surface mounted hardware.
  6. Prepare doors to receive glass or grilles as required. Provide removable stops secured with countersunk tamperproof head screws at 6" (150 mm) o.c. Prepare exterior doors to receive 1" (25 mm) thick insulated sealed glass units.
  7. Weld door and panel components together to provide integrated units, square, true and free from distortion or waves. All 18 gauge doors to have welded seams minimum 30% overall and 2" (50 mm) length welds. Weld above and below all hinge locations. All 16 gauge doors to be continuously welded. Grind and fill smooth welded seam.
  8. Door head and bottom shall have channel shaped member, closing off top and bottom of door flush with face skins. NOTE: close off top and bottom of exterior doors even with outer edge of door.
3. Fire Rated Doors
    1. Provide doors, frames and hardware with Underwriters Laboratories of Canada (ULC) labels, clearly visible, where required to be fire rated or installed in fire rated assembly.
  4. Door and Screen Frames

1. Provide steel hollow metal door and window frames for openings indicated on Door Schedule and as detailed elsewhere on drawings.
2. Form interior hollow frames to profile indicated of 16 U.S. gauge (1.613 mm) hot rolled "wipe coat" zinc coated steel. Construct exterior frames of 16 U.S. gauge (1.613 mm) hot rolled, zinc coated steel.
3. Cut mitres and weld corners continuously along inside frame profile. Fill corners of steel frames with metallic paste filler and sand smooth and uniform. Do not weld corner of removable stop.
4. Provide 10 gauge (3.51 mm) channel stiffeners in mullions each side of door openings occurring in screens, or as required to provide a rigid installation.
5. Prepare removable stops secured with counter-sunk tamperproof screws at 6" (150 mm) o.c.
6. Provide three (3) neoprene single stud bumpers for each interior door frame and (2) bumpers at head for pairs of doors.
7. Prepare frames for mortise type hardware at all doors except panic hardware locations at exterior doors, stair doors, corridor cross doors, gym doors and library doors. Blank, reinforce for butts with 1/4" (6.35 mm) steel plate, drill and tap as required. Reinforce both sides of every door closer, provide for concealed door closers where required.
8. Cover reinforcement plates or attachments and cut-outs with 22 gauge (0.853 mm) steel sheet boxes to protect against mortar. Provide channel or angle spreaders readily removable.
9. Provide adjustable "Tee" or wire masonry anchors with head of No. 6 gauge (4.94 mm) steel and body of 10 gauge (3.510 mm) corrugated steel where frames are built into masonry, except at thermal broken frames. Provide manufacturer recommended anchor at all other locations.
10. Supply three anchors for jambs between 4'0" (1219 mm) and 7'0" (2134 mm) and four anchors for jambs exceeding 7'0" (2134 mm) high. Adjustable type shall be as recommended by manufacturer. Provide adjustable jamb anchors for fixing at floor.
11. Provide head reinforcement in frames wider than 4'-0" (1200 mm) and where indicated or recommended by manufacturer.
12. Prepare frames for electric hardware and security systems. Reinforce and drill and tap frames as required. Coordinate with

Div.16.

13. Prepare frames for continuous door length type hinges where indicated on door schedule.
14. Provide 12 gauge (2.66 mm) reinforcing in frames for continuous door length type hinges where indicated on door schedule.
15. Provide removable mullions where indicated on door frame schedule.

5. Thermal Door Frames and Screens

1. Equal to "Therma-Frame" door frames and screens as manufactured by S. W. Fleming Ltd. at all exterior hollow metal door frame and screen locations as indicated on drawings and in the door schedules.
2. Frames must meet or exceed CGSB 82-GP-5M.
3. All jambs, heads, sills, centre rails and mullions will be fabricated from 16 gauge (1.613 mm) wipe coated galvanized steel meeting the requirements of ASTM Designation A527, Coating Class A01.
4. Interior and exterior frame sections shall be separated by a Polyvinyl Chloride (PVC) thermal break and the sections must not be fixed by screws, grommets or other fastening devices.
5. Wall and floor anchors to be supplied to suit wall conditions and shall be designed so as not to permit thermal transfers from exterior to interior surfaces of the frames sections.
6. Where doors are required frames shall be mortised, reinforced, drilled and tapped to receive hardware as specified in the hardware list.
7. Where welded frames are employed, welds must not cause thermal transfers between exterior and interior surfaces of the frame sections.
8. Provide reinforcement in frames wider than 4'-0" (1200 mm) and where indicated or recommended by manufacturer.
9. Prepare frame for hardware, electronic hardware and security systems. Drill, tap and reinforce frames where required.
10. Prepare for 1" (25 mm) thick insulated glass units at all glass locations in doors and screens.

6. Metal Panels and Closures

1. Provide 16 U.S. gauge (1.6 mm) hot rolled zinc coated steel closures (at corners and/or between frames) and panels as indicated and detailed on drawings.

### **3. EXECUTION**

#### 1. INSTALLATION

##### 1. Frame Installation:

1. Allowable limit of distortion shall be 1/16" (1.5 mm) out of plumb each jamb, measured on face of frame, resulting in maximum twist of frame of 1/8" (3 mm) measured diagonally from upper to lower corner.
2. At masonry walls: install frames using the corrugated or wire masonry anchors. At preformed openings and exterior thermally broken doors use machine screws and expansion anchors as provided for this application. After installation, fill countersunk screw heads flush with frame and sand smooth ready for painting. Fill exterior frames with spray-on insulation by Section 07215. Co-operated with masonry trade who will fill interior frames with mortar.
3. Brace frames solidly in position while being built in. Install temporary spreader of wood at mid-height of frame until adjacent wall work is completed. Provide vertical support at centre of head for openings of 4'-0" (1200 mm) wide or wider.
4. Remove temporary jamb spreader bars and vertical supports only after frames are securely anchored in place.

##### 2. Door Installation:

1. Install hollow metal doors plumb, true and level and at correct elevation.
  2. Co-ordinate installation of hardware.
  3. Adjust operable parts to ensure proper operation.
  4. Install hollow metal panels and closures with concealed fastenings.
  5. Install acoustical assembled doors and frames as per manufacturer's recommendation.
3. Install fire rated doors and frames in accordance with National Fire Codes, Volume 4, produced by National Fire Protection Association (NFPA 80).

4. Attach fire rating labels to doors and frames required to be fire rated. Ratings shown on door schedule are minimum. Attach temperature rise rated labels to doors required to be 90 MFR or greater.
  5. Make allowances for deflection of structure to ensure structural loads are not transmitted to frames.
  6. Install doors and hardware in accordance with hardware templates and manufacturer's instructions and Section 08700 - Finish Hardware.
  7. Adjust operable parts for correct function.
  8. Install glazed lites, stops and louvres.
  9. Install door grilles provided by Mechanical Contractor.
2. TOUCH-UP
1. Remove rust, clean and touch-up any damaged galvanizing with "Zincrich" or "Galvicon" paint.
  2. Remove rust, clean and touch-up any damaged paint with approved primer.

**End of Section**

**1. GENERAL**

1. GENERAL REQUIREMENTS

1. Division One, General Requirements, is part of this section and shall apply as if repeated here.

2. QUALIFICATIONS

1. Manufacturers approved for the work of this Section are:
  1. Kawneer Company, Canada Limited.
  2. Fulton Windows (Commador Aluminum doors)
  3. Alumicor
  4. Aerloc
  5. SaffiFirst
2. No other manufacturer or supplier, except those noted above, shall be used unless approved in writing by the Architect seven (7) days prior to tender closing.

3. SHOP DRAWINGS

1. Submit shop drawings in reproducible vellum form in accordance with GC 3.11 of CCDC Document 2-2020 and Section 01300 – Submittals.
2. Submit shop drawings for the fabrication and installation of associated components of the work. Indicate anchors, joint system, expansion provisions, hardware, and other components not included in manufacturer's standard data. Include glazing details (where required).
3. Before shop drawings and fabrication are started, take critical measurements at the site to facilitate installation and fitting of work.
4. **Shop drawings that are submitted are to be in the units of the tendered drawings with critical on center mullion dimensions (dimension string from datum level to top of opening noting center of mullions) noted along with all other regular shop drawing dimensions, no exceptions. Both units (metric and imperial) are allowed. Openings are to be identified with the corresponding tags on the tendered drawings. (Coordinate with typical A8 drawing notes)**

4. SUBMITTALS

1. Submit samples of sections and finishes for Architect's approval before fabrication.
2. Furnish templates, diagrams, and other data to fabricators and installers of related work, as needed for coordination installation.

3. Coordinate with **Division 16**, Section 08700 Finish Hardware and security subcontractor for any electrical provisions required.

5. DESIGN

1. Design for wind and snow loads as set out by the Ontario Building Code, 2012 as currently amended for the building location. Copies of any and all structural calculations made in connection with the supplementary design and/or detailing of the work of this section shall be promptly furnished to the Architect if requested.
2. Submit with shop drawings certification that window and entrance design and construction will meet the specified requirements. Certification shall be in the form of test reports on similar units performed by an independent testing laboratory, and shall meet approval of Architect before fabrication commences.

6. WARRANTY

1. The Work and materials of this Section shall be under warranty in accordance with GC 12.3 of CCDC Document 2 - 2008 but for a period of five years and ten (10) years for hermetically sealed units from the date of Architect's Certificate of Substantial Completion.

**2. PRODUCTS**

1. MATERIALS

1. Aluminum: Extruded Members: 6063-T54 alloy and temper.
2. Fasteners, Screws & Bolts: 300 Stainless Steel or 400 series stainless steel cadmium plated and of sufficient size and quantity to perform their intended function.
3. Glazing Tape: Tremco 440 tape with built-in shim and as recommended by window manufacturer.
4. Weathering and Glazing Gaskets: Extruded black closed cell or dense elastomer of durometer appropriate to the functions.
5. Spacer Shims: oil resistant rubber or plastic acceptable to glass manufacturer, channel shaped and approximately 4" long (100 mm).
6. Silicone Sealant: Dow Corning #795 or as per manufacturers recommendations exceeding CAN2-19.13-M82 Class 40 requirements.
7. Isolating Coating: Black alkali resistant bitumastic enamel.
8. Spray-On Insulation: Supply and install by this section as per Section 07215.
9. Miscellaneous: Supply all covers, copings, special flashings, filler pieces,

termination pieces, caps closures and expansion joint covers as required and as indicated on drawings.

10. Glass for Aluminum Doors: as per 08800 Glass and Glazing Section.
11. Glass for Exterior Aluminum Entrance Framing: as per 08800 Glass and Glazing Section.
12. Glass for Interior Aluminum Screens: as per 08800 Glass and Glazing Section.

## 2. FABRICATION

### 1. General

1. Construct aluminum assemblies of extruded sections to size and profile shown on drawings.
2. Build units square, true, accurate to size, free from distortions, waves, twists, buckles or other defects detrimental to performance or appearance.
3. Units too large for handling or shipping shall be prefabricated in shop, disassembled and marked for shipping and field assembly.
4. Use concealed fastenings. No exposed screws shall show in the finished work unless approved by the Architect. Such screws shall be countersunk and finish match surfaces in which they occur.
5. Joints shall be accurately cut and fitted to result in a tightly closed joint.

## 3. DOORS, ENTRANCE SCREENS, INTERIOR SCREENS

### 1. Frames

1. "Kawneer Trifab 451UT, Center, Interior Glazed" thermally broken framing at exterior entrance screens where the door system is stand alone.
  2. "Kawneer Trifab 451, Center, Interior Glazed" framing at interior entrance screens where the door system is stand alone.
  3. For products listed above, coordinate with manufacturer and drawings for side light base heights (dimension to match doors) with associated aluminum sill flashing, metal liner, insulation and aluminum panels where indicated on drawings.
2. Conform to CAN3-A440-M90 performance standards Air Leakage to meet the Fixed rating, and Type A3, Water Leakage Type B5 and Wind Resistance Type C7.

3. Doors

1. Exterior entrance / vestibule doors to be insulated "**Kawneer 560 InsulClad**" with insulated double glazing.  
(Coordinate with door schedules on drawings)
2. Interior entrance / vestibule doors to be "**Kawneer 500 Wide Stile**" with single glazing.  
(Coordinate with door schedules on drawings)
3. Coordinate with door schedules for heads and stiles sizing and base height. Adjacent screens / curtain wall bases to match door base height typical.
4. Provide mid-rail at all doors that require panic devices, coordinate with door schedules for sizing.
5. The core shall be foamed-in-place urethane foam at density of 5.0 lb./cu.ft. (64 kg.m<sup>3</sup>). Provide insulated aluminum panel where indicated on drawings.
6. Stiles shall have a wall thickness of .125". (3.2 mm). Glazing mouldings shall be .050" thick (12.7 mm).
7. Use snap-in type square glazing stops with neoprene bulb type glazing. Do not use exposed screws to secure stops. Use lock-in, tamperproof type stops.
8. Equip door leaf with an adjustable mechanism in top rail near the lock stile, to provide for minor clearance adjustments after installation.

4. Door Hardware

1. Equip all aluminum doors with continuous weather stripping with adjustable weather stripping at the base; and aluminum thresholds, 6mm (1/4") maximum vertical height, over 6mm up to 1/2" (12.7mm) height to be sloped / bevel in a 1 in 2, 50%. Closer cover to match door finish colour.
2. Equip all aluminum doors with full height (continuous) heavy-duty stainless steel hinge.
3. All other hardware including concealed closers, exposed closers, locksets, exit device, push/pulls, overhead stops, handicap automatic door openers to be supplied under Section 08700 – Finishing Hardware and installed under Section 06200 – Finish Carpentry.

5. Finish

1. Prepare and fabricate components as required before finishing.
2. Finish to be clear anodized.
3. Metals other than aluminum shall match colour finishes.
6. Closures, Flashings and Miscellaneous Covers
  1. Provide .125" (3 mm) thick aluminum closures and caps where required.

### **3. EXECUTION**

#### **1. INSTALLATION**

1. Secure work adequately and accurately to the structure in required position and in manner not restricting thermal movement. Work shall be plumb, square and level, free of twist, warp or other superimposed loads. Provide shims as required.
2. All metal to metal joints shall be sealed to provide a weathertight assembly in accordance with manufacturer's instructions.
3. Use concealed fixings where possible, where not possible use flat head screws in countersunk holes. Exposed bolt or nut heads not permitted. Match exposed fastenings with surfaces on which they occur.
4. Isolate all aluminum coming in contact with unlike materials with heavy shop coating of black alkali resistant bitumastic enamel to prevent electrolytic or chemical reaction.
5. Fill voids between aluminum extrusions and wall surfaces at exterior doors and entrance framing with foam spray applied insulation where required to prevent movement or infiltration of air. Supply and install spray-on insulation as per Section 07215 – Spray-On Insulation.
6. Supply and install all caps and closures where required to create a complete installation and as indicated on the drawings.

#### **2. CAULKING**

1. Caulking between aluminum and aluminum; aluminum and glass to conform to this section. Caulking to perimeter drywall masonry and concrete all by this section as per Section 07900 - Sealants.
2. Caulking by this Section shall be installed as per Section 07900.

#### **3. GLAZING**

1. Glaze windows in accordance with CAN3-A440-M90.

2. Set glazing tape against permanent stops, allow 1/8" for cap bead, set horizontal strips first using full width pieces of tape, then set vertical pieces. Butt tape at corners, do not lap tape or run continuous at corners.
  3. Set glass on setting blocks, number as recommended by glass manufacturer. Set glass with draw lines horizontal.
  4. Apply heel bead on interior, using sealant. Place spacer shims, set glazing tape against glass and install stops.
  5. Apply cap bead to fill void on exterior. Tool sealant with a slight bevel, sloped away from the glass to create a water shed.
  6. Mark each light with a large white cross to indicate the presence of glass.
  7. Replace under this section defective, damaged or broken glass due to faulty setting, handling or storage.
  8. Neoprene bulb type glazing in accordance with manufacturer's instructions.
4. ADJUST AND CLEAN
1. Adjust all hinges, closers and weather stripping for optimum condition. Lubricate operating equipment.
  2. Clean surfaces promptly after installation, exercising care to avoid damage of the protective coating (if any).
  3. Advise the contractor of protective treatment and other precautions required through the remainder of the construction period, to ensure that doors will be without damage or deterioration (other than normal weathering) at the time of acceptance.
  4. Aluminum shall be isolated from concrete, mortar, plaster and dissimilar metal with bituminous paint. Windows shall be protected from other building materials during and after insulation until acceptance by the General Contractor. Thereafter, it shall be the responsibility of the General Contractor to maintain protection and provide final cleaning.

**END OF SECTION**

**1. GENERAL**

1. GENERAL REQUIREMENTS

1. Division One, General Requirements is a part of this Section, and shall apply as if repeated here.
2. Supply, install and removal of temporary construction cores are to be included in the base bid and NOT part of the cash allowance.

2. CASH ALLOWANCE

1. See section 01020 for cash allowance to be carried in base bid.

3. INSPECTION

1. Hardware supplier shall check all hardware when it has been installed and shall notify the Architect of any cases where it has not been properly installed, is defective, or is not as specified. Replace defective hardware. Hardware supplier or closer manufacturer on his behalf shall check all door closers after they have been installed to make sure that all adjustments such as back checking degree have been properly made. Notify the Architect of any closers which have not been properly adjusted.

4. SCHEDULING AND PACKAGING

1. Supply finishing hardware to those who are to install it complete with templates and other complete installation instructions, in sufficient time to avoid delaying the progress of the work.
2. Package hardware separately for each door or unit and state clearly on each package the number and description of the door or unit for which the hardware therein is intended.
3. Supply all required expansion shields, anchors, and other related accessories for satisfactory attaching or installing all finishing hardware.
4. Supply a key box to hold a minimum of 2 keys for each door.

5. HARDWARE LISTS

1. Prepare and submit for approval, 5 copies of a hardware list indicating the type, manufacturer, number, location and finish of each item of finishing hardware supplied under this Section.

6. Installation Items

1. The items listed below are for the figuring of installation costs only.

sets of weatherstripping  
door sweeps surface applied  
thresholds  
surface astragals

auto door operators (installed)  
surface bolts  
deadlocks 161 prep  
door pulls tb mounting  
wall/floor stops  
surface pull plates  
push plates  
sets auto flush bolts  
concealed overhead door stops (aluminum doors)  
surface overhead stops  
medeco rim cylinders for (aluminum doors)  
co-ordinators surface  
lock guard  
surface door closers  
closer drop plates  
rim exit devices  
electric strikes  
cylindrical locksets/privacy/latchsets  
mortise deadlocks  
removable mullions  
lengths of continuous hinges  
hinges full mortise

**End of Section**

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**1. GENERAL**

1. GENERAL REQUIREMENTS

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

2. WARRANTY

1. The Work under this Section shall be warrantied in accordance with GC 12.3 of CCDC Document 2 - 2020 but for a period of 10 years on insulated units and 5 years on all other work from the date of Architect's Certificate of Substantial Completion.

3. PROTECTION

1. Mark each light with a large cross to indicate presence of glass (colour that stands out to the visible eye). Use material that will leave no residue after removal.
2. Replace under the work of this section, defective, damaged or broken glass due to faulty setting, handling or storage.

4. SUBMITTALS

1. Submit shop drawings in accordance with CCDC Document 2-2020 and Section 01300 - Submittals for items 2.15 and 2.16 below designed and stamped by a Certified Structural Engineer from Ontario for the design thickness of the glass as a Guard per latest OBC, as currently amended.

5. STANDARDS

1. Design in conformance with CAN/CGSB-12.20-M, structural design of glass for buildings.

**2. PRODUCTS**

1. MATERIALS (all exposed glass edges shall be polished and chamfered typical)

1. Float Glass: 1/4" (6 mm) minimum clear float glass conforming to CAN/CGSB - 12.3 M91.
2. Tempered Glass: 1/4" (6 mm) minimum clear glass tempered conforming to CAN/CGSB - 12.1 M90 equal to Ford Glass.
3. Laminated Safety Glass: 1/4" (6 mm) minimum clear core laminated conforming to CAN/CGSB - 12.1-M90.
4. Fire Rated Glass: 5mm thick ceramic fire-rated glass to be Firelite NT Premium Grade or Keralite Select F or equal, conforming to CAN 4 S-104 and CAN 4 S-106 for fire-rating, and CAN/CGSB12.11-M90 for impact-safety rating. Glass shall be installed with PVC glazing tape and neoprene

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setting blocks.

- Pyran Platinum F to be considered an acceptable alternate.

1. At exterior locations, fire-rated glass shall be insulating glass, nominal 25mm OT, consisting of silicone seals, air-fill, and steel spacers, and as follows:

- Out-board lites: 6mm clear tempered Low E
- Inboard lites: Firelite Premium NT or Keralite Select F

2. At interior frameless or semi-framed locations, TGP Pilkington Pyrostop or equivalent brand Contraflam Structure by Vetrotech are specified for fire-rated 'frameless' (steel-angle) interior Temperature Rise screens, with butt-joints as indicated on Drawings. Include steel L-angles and construct with fire-rated drywall, according to Manufacturer's Listing and Instructions. Glass shall be installed with PVC glazing tape and neoprene setting blocks.

6. Glazing Tape: Tremco 440 tape and as indicated in other glass sections, also to be confirmed by manufacturer's written recommendations.

7. Sealant: CWS by Dow Corning.

8. Heal Bead Sealant: One part polysulphide or acrylic sealant conforming to CGSB 19-GP-5 and as indicated in other glass sections.

9. Spacer Shims: neoprene, Shore "A" durometer hardness 80, 3" (75 mm) long x 0.08" (2.4 mm) thick and 3/8" (9 mm) high.

10. Setting Blocks: neoprene, Shore "A" durometer hardness, 4" (100 mm) long x 1/4" (6 mm) high x width to suit glass thickness.

11. Primer: Sealers and cleaners to glass manufacturer's standard

12. Vision Glass: Sealed insulated glass units, ten (10) year guarantee, 1/2" (12.7 mm) 90% argon and 10% air space, hermetically sealed, insulating units conforming to CAN/CGSB - 12.8 - M90 and with thermally broken stainless steel glazing spacer. Warm edge spacer is only allowed in curved glazing units.

NOTE: colour selection of glass to be confirmed by Architect prior to manufacturing.

1. Outer Light Glass Types:

1. 6mm (1/4") Tempered Solargray with Solarban 70 (Surface 2) by P.P.G. Canada or approved equal at all vision locations.

2. Inner Light Glass Type:

- 
1. 6mm (1/4") Clear Tempered by P.P.G. Canada or equal.
- 
16. Vision Glass for Exterior Entrance Doors: Sealed insulated glass units, ten (10) year guarantee, 1/2" (12.7 mm) air space filled with 90% Argon and 10% air, hermetically sealed with stainless steel thermally broken glazing spacer (warm edge spacer to be used only at radius / curved glazing units) insulating units conforming to CAN/CGSB - 12.8 - M90.
    1. Outer Light Glass Types:
      1. 3mm Heat Strengthened Clear / .090" PVB interlayer / 3mm Heat Strengthened Clear by P.P.G. or equal.
      2. 4mm Heat Strengthened Clear / .090 PVB interlayer / 4mm Heat Strengthened Clear by TRULITE or equal (9.525mm (3/8") air space)
    2. Inner Light Glass Type
      1. 5mm Solarban 60 (3) Clear Tempered by P.P.G. or equal.
      2. 6mm Solarban 70 (3) Clear Tempered by TRULITE or equal.
  17. Glass for Interior Doors:
    1. 6mm Clear Tempered by P.P.G. / TRULITE or equal.
  18. Glass for Framed Interior Screens
    1. 6mm (1/4") minimum Clear Tempered by P.P.G Canada or Equal.
  19. Glass for Semi-Framed Interior Screens
    1. 12mm (1/2") minimum Clear Tempered by P.P.G Canada or Equal with caulked butt joints complete with clear CWS silicone by DOW Corning .
  20. Vision Strips / Frosted Glass
    1. Frosted Vinyl adhesive by 3M or Solar Graphics, colour and or pattern to be selected by Architect during shop drawing submittal prior to ordering. Exterior applications are to be on glazing surface #4 (interior surface). There are to be no air bubbles behind the film and between glass surfaces after application.
  22. **NOTE: Applicable to all glass and glazing lower than 1070mm above finished floor (main floor levels, stair landings, etc) that is not**

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**protected by some type of interior guard, to be designed to withstand the loading on guards as per OBC SB-13; where the difference in elev. between the adjacent ground or floor level is more than 600mm typical.**

23. **NOTE: Applicable to all glass and glazing located in a fire rated wall system / assembly or exposure situations to be fire rated glass / glazing.**
24. **NOTE: Applicable to all glass and glazing, contractor shall verify and provide thickness to be confirmed by manufacturer for the assembly in which the glazing is installed, to be submitted in shop drawings stamped by a professional engineer before any manufacturing. Glazing tape to be as per manufacturer's written recommendations.**

### **3. EXECUTION**

#### 1. WORKMANSHIP

1. Installation of glass shall be by workmen skilled in this trade and done in strict accordance with material manufacturer's directions to produce a first class installation.
2. Accurately cut glass to fit opening and provide for glass expansion.
3. Carefully remove glazing stops and replace after glazing. Exercise care to prevent damage to stops.
4. Collect all glass cuttings in boxes and remove when cleaning up debris.
5. Cut glass and mirrors from dimensions taken in field.
6. Remove protective coatings and clean contact surfaces with solvents and wipe dry.
7. Apply primer-sealer to contact surfaces.

#### 2. DOORS, SIDELIGHTS AND SCREENS

##### 1. Interior Lights

1. Glaze with glass as indicated, using mastic glazing compound.
2. Set glass with equal bearing full width of pane. Use setting blocks as per manufacturer's instructions.
3. Apply thin layer of mastic compound to rebate, set glass, then press until even bed is secured, sprig and run face compound, replace removable stops.
4. Insert spacer shims to centre glass in space. Place shims at 2'-0" (600 mm) o.c. and keep 1/4" (6mm) below the sight line.

5. Installation shall be rattle free.
2. Exterior Lights
  1. Set glazing tape against permanent stops, allow 1/8" (3.2 mm) for cap bead, set horizontal strips first using full width pieces of tape, then set vertical pieces. Butt tapes at corners, do not lap tape or run continuously.
  2. Set glass on setting blocks, quantity as recommended by glass manufacturer. Set glass with draw lines horizontal.
  3. Apply heel bead on interior using sealant. Place spacer shims, at 2'-0" (600mm) o.c. and keep 1/4" (6mm) below the sight line. Set glazing tape against glass and install stops.
  4. Apply cap bead to fill void on exterior. Tool sealant with a slight bevel, sloped away from glass to form a water shed.
3. ALUMINUM WINDOWS, ENTRANCE FRAMING AND DOORS
  1. Specified under this Section.
4. HOLLOW METAL DOORS AND SCREENS AND WOOD DOORS
  1. Specified under this Section.
8. MIRROR INSTALLATION
  1. Install mirrors where indicated using full adhesive bed and clips.
  2. Provide unframed mirrors with polished smooth edges as shown on drawings. Mirrors shall be equally divided into units, or as shown on drawings.
9. GLASS FOR INTERIOR SCREENS
  1. Specified under this Section.
10. FINISHING
  1. Immediately remove sealant and compound droppings from finished surfaces. Remove labels after work is completed and inspected by Architect.

**END OF SECTION**

**PART 1 - GENERAL**

1. GENERAL REQUIREMENTS

1. Division One - General Requirements are part of this section and shall apply as if repeated here.

2. QUALIFICATIONS

1. Conform to CSA A82.30-M1980 including appendices.

**PART 2 - PRODUCTS**

1. MATERIALS

1. Non-load-bearing channel stud framing less than 4800 mm long: to ASTM C645-83 size as noted on drawings, roll formed from 25 gauge (0.53 mm) thickness electro galvanized steel sheet; for screw attachment of gypsum board. Knock-out service holes at 1'-6" (460 mm) centres.
2. Extra strength channel stud framing (4800mm long and greater): to CAN 3-S146-M84 for design and ASTM A446 for steel, 3 5/8" (92 mm) or 6" (152 mm) stud size, roll formed from 20 ga. (0.91 mm) thickness hot dipped galvanized steel sheet; for screw attachment of gypsum board. Knock-out service hole a 1'-6" (460mm) centres. Use this type at all exterior framing locations. Note interior extra strength stud partitions with drywall on both sides can be electro galvanized finish.
3. Floor and ceiling tracks: to ASTM C645-83; in widths to suit stud sizes, 1 1/4" (32 mm) flange height. Use hot dipped galvanized units at exterior wall and exterior canopy locations.
4. Metal channel stiffener: size to suit studs, 2 mm thick cold rolled steel, coated with rust inhibitive coating. Use hot dipped galvanized units at exterior wall and exterior canopy locations.
5. Bridging channels and diagonal tension straps (load bearing stud systems): material and gauge to match studs, let into or surface fastened to studs for diagonal/lateral bracing and reinforcement.
6. Screws: CGC Branch Screws (or approved equal) of type recommended in the selector guide on Page 5 of Canadian Gypsum Brochure 09250 - 1E. Use hot dipped galvanized or epoxy coated fasteners at exterior walls and canopies.
7. Furring Channels: 7/8" (22 mm) x 2 3/4" (70 mm), 25 Ga. (18 mils), cold rolled galvanized after fabrication, types manufactured by Bailey Metal Products Limited, D-1001, Donn Products, Universal Sections or Canadian Gypsum Co. to meet CSA A82.30-M1980. Use hot dipped galvanized units at exterior walls and canopies.

8. Resilient Channels: 1/2" (13mm) x 2 1/4" (57mm), Bailey RC Plus, manufactured by Bailey Metal Products Limited, Model No. D-1007, to meet ASTM A653/A653-11. Use G40 galvanizing to ASTM C754-11.
9. Carrying Channels: 1 1/2" (38 mm) x 6 lbs./10 ft. (892 g/m) cold rolled steel after fabrication to meet CSA A82.30-M1980. Use hot dipped galvanized units at exterior walls and canopies.
10. Hangers: 1/4" (6.3 mm) dia. galvanized pencil rods at 4'-0" (1220 mm) o.c. maximum on main tees to meet CSA A82.30-M1980.
11. Tie Wire: No. 16 (1.5 mm) Imperial Wire gauge galvanized soft annealed to meet CSA A82.30 - M1980.
12. Anchors: to meet CSA A82.30-M1980 standard.
13. Heavy Duty Studs: 4" (100 mm) and 6" (150 mm) 16 gauge (1.5 mm) as supplied by Bailey Metal Products Ltd., Toronto, Ontario.
14. Batt Insulation (exterior stud walls): Coordinate with Specification Section 07213, Mineral Fibre Insulation, thickness to suit stud cavity.
15. Vapour Barrier: at exterior stud walls install 6 mil poly to CGSB 51.34 complete with sealants.
16. Acoustical Sealant: Acoustical sealant to CGSB 19-GP-21M by Tremco or approved equal.
17. Insulating Strip: Rubberized, moisture resistant 1/8" (3mm) thick foamstrip, 1/2" (12mm) wide with self-sticking adhesive on one face, lengths as required.
18. Blocking: Bailey Backer Bar, interior partition use

### **PART 3 - EXECUTION**

#### 1. GENERAL

1. Installation shall be by mechanics skilled in this trade and done in accordance with best standard practice and material manufacturer's printed directions.
2. Do not cover piping, conduit, duct and the like until inspected and approved by the Architect.
3. Furring indicated shall not be regarded as exact or complete.
4. Method of framing and furring left to Contractor's option but shall result in a rigid, secure, plumb framing and forming, erected to maintain overall sizes as indicated and of adequate strength to support without distortion

of the facing indicated. Wall furring and suspended and furred ceilings must be installed to meet CSA A82.31-M1980 except where specified otherwise.

5. Do not make fastenings to ducts, pipes, conduit, door frames, backers or inserts of other trades not specifically intended for fastening metal furring.
6. The completed installation of framing and furring must allow drywall to be installed free of waves, depressions, other defects that would mar the finished appearance.

## 2. PARTITION WALLS.

1. Install partition tracks at top and bottom of studs, align accurately, and make allowance for deflection under beams and structural slabs to avoid transmission of structural loads to studs. Use 2" (50 mm) leg ceiling track.
2. Secure tracks to concrete and steel with power actuated fasteners at a min. 24" (600 mm) o.c.
3. Install dampproof course (vapour barrier) under stud shoe tracks of partitions on slabs-on-grade.
4. Place studs vertically at 16" (400 mm) centres and not more than 2" (50 mm) from abutting walls, openings and each side of corners. Secure studs to tracks at floor and ceiling using screws or crimp method. Place interior heavy duty studs vertically at 12" (300 mm) centres where indicated on drawings.
5. When necessary, splice studs with 8" (200 mm) nested lap and one positive attachment per stud flange. Place studs in direct contact with door frame jambs, abutting partitions, partition corners and existing construction elements. Where studs are installed directly against uninsulated surfaces install insulating strips between studs and wall surfaces.
6. Anchor studs for shelf-walls and those adjacent to door and window frames, partition intersections and corners to ceiling and floor runner flanges with an approved crimping tool. Securely anchor studs to jamb and head anchor clips of door or borrowed-light frames, place horizontally a cut-to-length section of runner, with a web-flange bent at each end, and secure with one positive attachment per flange. Position a cut-to-length stud (extending to ceiling runner) at vertical panel joints over door frame header.
7. Install heavy gauge single jamb studs at all openings.
8. Erect metal studding to tolerance of 1:1200.
9. Stiffen partitions exceeding 8' (2400 mm) in height and/or 10' (3000 mm) in length with 3/4" (19 mm) channel bracing extending horizontally across

the length of the partition. Provide one horizontal stiffener for partitions under 12' (3600 mm) high; at least two horizontal stiffeners for partitions 12 or more feet high (3600 or more mm), at maximum 6' (1800 mm) centres. Install metal strapping securing stud to masonry or concrete walls at every other stud where horizontal stiffeners occur. Provide other partition reinforcing necessary to support wall hung components, cupboards, closets and the like. Use 2 studs at jambs of openings and corners.

10. Where horizontal runs of service lines are to be installed within the partition, erect studs with web openings aligned.
11. Provide reinforcing and necessary stiffeners to support hollow metal screens. Reinforcing to be capable of supporting screens rigidly and solid without deflection.
12. Work includes the installation of hollow metal frames.
13. All fire rated partitions must be installed from floor to underside of floor slab at ceiling above.
14. Provide horizontal 25 ga. metal anchor strips with wood blocking behind it for blocking behind wood base millwork tackboard and chalkboard, etc. All wood blocking for trim, base, millwork, miscellaneous specialties, to be installed by Section 06100 after erection of metal studs and ceiling suspension system.

### 3. RESILIENT CHANNELLING ON PARTITIONS AND WALLS

1. Work includes as below
2. Installation on Substrate: new and existing (on wood stud framing, metal stud framing, concrete block masonry, brick masonry, poured in place concrete, bulkheads, and all other substrates not noted, that is exposed and seen by line of sight)
  - .1 **Walls are to be flat and an even / level & plumb plane, install resilient channelling, blocking, shims as required to achieve this. A wavy wall will not be accepted – wall types do not have to state this in order for it to be installed.**
  - .2 Install resilient channelling (13mm – ½" min.) at 400mm o/c maximum horizontally on substrate framing as to manufacturer's installation instructions (it is important which direction the fastened side is orientated). Ensure substrate framing is adequate to support loading of wall finish and resilient channelling loadings as per manufacturer's installation instructions / recommendations.
  - .3 Resilient channelling should not be required on new framed wall systems (unless noted otherwise on wall types) as these should be an even / level and plumb plane when installed – if not the

framing is to be rectified.

- .4 Also consult manufacturer's installation instructions for other requirements that are to be met.
- .5 Erect resilient channelling to tolerance of 1:1200.

4. BULKHEADS

- 1. Work includes fire separations in ceiling space, drywall surfaces above windows and bulkheads to suspended ceilings.
- 2. Install steel studs and furring of sizes shown at 16" (400 mm) o.c. or as shown.
- 3. Furring indicated shall not be regarded as exact or complete. Provide adequate bracing at bulkheads to structure to ensure a rigid installation and to meet CSA A82.31-M1980.
- 4. Locate bulkhead furring no more than 2" (50 mm) from corners abutting partitions or other construction.

5. HEAVY DUTY STUDS

- 1. Use heavy duty studs where shown on drawings and as required in other locations to give firmness to bulkheads.
- 2. Secure studs at ends with solid bearing at bulkheads.

6. CONSTRUCTION OF SOUND ATTENUATED PARTITIONS AND AROUND STEEL JOIST AT TOP OF MASONRY CLASSROOM & FIRE RATED WALLS

- 1. Install insulating strips under studs and tracks around perimeter of sound control partitions. Install acoustical sealant at joints at each side of studs and tracks, against insulating strips between studs and tracks and floor, wall or underside of floor or roof deck above.

**END OF SECTION**

**PART 1 - GENERAL**

1. GENERAL REQUIREMENTS

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

2. DESCRIPTION

1. Work of this Section includes:
  - .1 Gypsum wallboard to partitions, ceilings, bulkheads furring and wall facings at all areas.
  - .2 Products finished by but not supplied under this section is 06260 Solid Mineral Profile Panelling.

3. QUALIFICATIONS

1. Contractor for this work to have a minimum of five years' experience in installation of wallboard.
2. Install work to CSA A82.31-M1980, C.G.C., Drywall Construction Handbook and the Manual of Gypsum Wallboard Construction by Gypsum Drywall Contractor's International except where specified otherwise.

4. DELIVERY, STORAGE

1. Store materials in a dry weatherproof enclosure. Store wallboard flat, in piles without overhanging boards.
2. Do not install damaged or deteriorated material but remove from site.
3. Materials as delivered shall bear the manufacturer's name branch name of material and where applicable, CAN/CSA classification.

5. JOB CONDITIONS

1. Air and surface temperature: Minimum 54 F (12 C) and maximum 77 F (25 C) for 24 hours before, during and until entire installation is complete.
2. Ensure proper ventilation, during and following joint treatment, to eliminate excessive moisture.
3. Examine surfaces in which wallboard is to be attached and check environmental conditions and do not commence work until surfaces and conditions are satisfactory.
4. Commencement of work will denote acceptance of conditions.

6. PROTECTION

1. Protect work of other sections against damage resulting from work of this section. Repair and make good to approval, damage to other sections caused by this work.

7. SUBMITTALS

1. Submit sample of each type of casing bead, corner bead, control joints, reveal moulding, etc.

**PART 2 - PRODUCTS**

1. MATERIALS

1. Gypsum Wallboard:

- .1 Manufacturer: Specification is generally based on Canadian Gypsum Co. Ltd. material but equivalent materials by other manufacturers are acceptable.
- .2 Backing Board and Gypsum Coreboard: CSA A82.27-M1977.
- .3 Gypsum Wallboard: CSA A82.27-M1977. Use Type 'X' (special fire retardant) board such as CGC Firecode 'C' when fire rating is required, 16 mm, (5/8") thick. Use board with round or tapered edges.
- .4 Exterior Sheathing: 5/8" (16mm) thick Dens-Glass Gold Fiberglass - Faced Sheathing by Georgia Pacific Corporation.
- .5 Tile Backer Board: at showers (walls and ceilings), washrooms (walls and ceilings), drinking fountains (walls), wet or moist areas receiving a tile finish: 16mm (5/8") thick, Dens-Shield tile backer board by Georgia-Pacific Corporation. Use board with round or tapered edges.  
(If existing wall systems do not have this wall substrate, it is to be installed, including removal of existing finish substrate and installation of specified substrate above – if existing wainscoting exists, contact architect for further clarification)  
(Tile Backer Board is not required on masonry wall substrates unless otherwise noted on drawings)

2. Accessories:

- .1 Casing beads, corner beads, fill type: 24 ga. (0.5 mm) base thickness commercial grade sheet steel with G90 zinc finish to ASTM A525-80A; perforated flanges; one piece length per

location.

NOTE: Use Beadex U Trim (thickness as required) where "J" mould is indicated on drawings as manufactured by Beadex Manufacturing Company Inc.

- .2 Screws: C.G.S. Brand Screws Type S. 1" (25 mm) and 1 ½" (38 mm) as required to C.S.A. A82.31-M1980. For exterior Sheathing and tile backer board use 1 1/4" Bugle head fine thread rust resistant drillpoint drywall screw (type S-12).
- .3 Joint Treatment Material: CGC MC "All-Purpose" and CGC MC "Joint Topping" compounds - to ASTM 0474 and 0475. Use materials recommended by board manufacturer for the proposed use. Material shall be pre-mixed, ready to use, in sealed cans.
- .4 Tile Backer Board Joint Treatment Materials: thin set mortar mixed with acrylic latex. Tape shall be 2" (50 mm) wide alkali resistant fibreglass tape. Screws to be self-taping rust resistant screws.
- .5 Reinforcing Tape: Perf-a-Tape by CGC or equal.
- .6 Adhesive: CGC "Durabond" 90 pre-mixed, ready to use in sealed cans.
- .7 Acoustic Materials:
  1. Acoustical Caulking: Acoustical sealant by Tremco or approved equal to CGSB 19-GP-21M.
  2. Sound Attenuation Batts: Section 07213 Mineral Fibre Insulation
- .8 Control Joint: equal to C.G.C. control joint No. 093.
- .9 Thermal Break: Permanent adhesive faced rubberized cork, 1/8" (3 mm) thick by width required.
- .10 Stud adhesive: to C.G.S.B. 71 GP-25M.

### **PART 3 - EXECUTION**

1. EXAMINATION
  1. Examine surfaces and other conditions on which work of this Section depends and do not proceed until conditions are suitable.
  2. Commencement of work will denote acceptance of conditions.

2. GYPSUM BOARD INSTALLATION

1. General:

- .1 Do not install gypsum board until work of other Trades which will be covered by the board has been installed and approved.
- .2 Use board of maximum practical length to reduce number of end joints. Install control joints in long runs of board.
- .3 Fit ends and edges closely, but do not force together.
- .4 Attach board to framing using screws, not nails.

2. Installation on Stud Framing:

- .1 Install board vertically or horizontally whichever results in fewer end joints, use longest possible lengths. Cut and fit boards around openings, beams, joists, ducts, light fixtures and similar items. Install board up to underside of slab or metal deck above to provide sound insulated walls and fire separations.
- .2 Minimize gypsum board joints over openings. Use one piece application to span over opening width where board lengths allow. There is to be no board joint directly over / above edge condition of opening.
- .3 Position edges over supports for vertical or horizontal application.
- .4 For single layer vertical application space screws 12" (300 mm) o.c. for field of panel and 6" (150 mm) o.c. staggered, along vertical abutting edges. For horizontal application space screws 12" (300 mm) o.c. in field and 8" (200 mm) and along abutting end joints. For double layer application, stagger joints in second layer of boards, a minimum of one-stud spacing in both directions and fasten with screws as before.

3. Installation on Ceiling:

- .1 Install board with long dimension at right angles to furring channels.
- .2 Position end joints over channel flange and stagger in adjacent rows.
- .3 Fasten board to channels with 1" (25 mm) type S screws spaced 12" (300 mm) o.c. in field of panels and 8" (200 mm) along abutting edges.

4. Install board continuously above ceiling at exterior walls to support vapour barrier where it occurs.

### 3. FIRE RATING

1. Conform with following for fire rated partitions, ceilings and bulkheads:
  - .1 Fire resistant ratings called for on drawings and schedules.
  - .2 Appropriate codes and regulations.
  - .3 Use "Firecode C" or approved equivalent gypsum board.

### 4. FINISHING

1. Mix joint compound (powder) in accordance with manufacturer's printed instructions.
2. Prefill "V" grooves of rounded edges with Durabond 90 compound. Finish flush with tapered surface ready for reinforcing tape application. Allow pre-fill material to dry thoroughly before application of embedding compound and tape.
3. Apply "All-Purpose" compound in thin uniform layer; embed reinforcing tape accurately centred on joint, securely pressed in, leaving sufficient compound under tape to provide proper bond. Immediately apply skim coat over tape application. Allow to dry thoroughly before application of filler coat.
4. Apply filler coat of "Topping" compound such that taper depression is flush with board surfaces. Allow to dry thoroughly before application of finish coat.
5. Apply finish coat of "Topping" compound extending slightly beyond the filler coat and feathered out onto the board surface.
6. Sand between coats and following the finish coat, where necessary, and leave surface smooth and ready for painting.
7. Finish screw depressions with filler material and finish coat as specified in 4. and 5. above.
8. Joint and depression finish shall in no case protrude beyond the plane of the board surface.
9. Finish corner beads and metal trim flush with board surface using filler and finishing coats feathered out approximately 2" (50 mm) and 4" (100 mm) respectively onto the board surface to ensure that metal visible only at

arris.

10. Fill and tape joints and internal corners and fill screw depressions in board face and smooth out along corner beads and metal trim with joint compound.
11. Provide specified metal trim and control joints at exposed edges, at junctions of drywall with dissimilar material, at control joints and at junction with columns. Fasten with screws at 12" (300 mm) o.c. along entire length.
12. Cut out a 'V' at all butt joints and install Durabond 90 then complete with filler and topping coats.
13. Avoid sanding adjacent paper surface of boards.

5. CLEANING

1. Clean thoroughly and remove all excess materials from other surfaces.
2. Remove all excess materials as job proceeds and at completion.

6. ACCESSORIES

1. Erect accessories straight, plumb or level, rigid and at proper plane. Use full length pieces where practical. Make joints tight, accurately aligned and rigidly secured. Mitre and fit corners accurately, free from rough edges. Secure at 6" (160 mm) o.c. for full length.
2. Install "J" molds around perimeter of suspended ceilings.
3. Install "J" molds where gypsum board butts against surfaces having no trim concealing junction and where indicated.
4. Install aluminum reveals at all locations as indicated on drawings. Install tape and joint material tight to edges of tape type "reveals". Aluminum reveal to be extruded Alloy 6063-T5 with chemical conversion coating. Primed painted – factory sprayed and baked-on coating to serve as base for field painting. Final paint as per specification Section 09900 and to be selected by Architect prior to manufacturing.
  - .1 25mm "F" Reveal Molding DRMF-625-100 by Fry Reglet or approved equal, where indicated on drawings.
  - .2 19mm "F" Acoustical Reveal – FARM-875-75 by Fry Reglet or approved equal.
  - .3 6mm channel screed Model PCS-75-25/25 by Fry reglet or approved equal, between wall wood panels (all horizontal and vertical applications) and where indicated on drawings.

7. CONTROL JOINTS

1. Construct control joints using C.G.C. control joint No. 093 set in gypsum board facing and supported independently on both sides of joint.
2. Provide shrinkage control joints in accordance to the best standard practice to meet the approval of the Architect and as noted on drawings.
3. Locate control joints at approximately 25 feet (7600 mm) in ceilings and walls and where shown on drawings.
4. Locate control joints at changes in substrate construction.
5. Install control joints straight and true.
6. Install additional control joints as directed on site by the Architect and as the subtrade recommends to eliminate future drywall problems.

8. ACCESS PANELS

1. Ceiling access panels to be 18" x 18" (460 mm x 460 mm) drywall to match adjacent ceiling finishes except at fire rated ceilings, and as noted on drawings.
2. Provide "J" molds at exposed drywall edges of panel and at ceiling opening.
3. Reinforce panel with 3/4" (19 mm) fire retardant plywood backer as required.
4. Install access panels at wall locations provided by Divisions 15 and 16.
5. Rigidly secure frames to furring or framing systems.

9. THERMAL BREAK

1. Provide a continuous moisture resistant insulating material at edges of wallboard in contact with aluminum windows and exterior door frames to provide a thermal break.

10. CERTIFICATION

1. Provide at completion of work a written certification that all drywall work where applicable conforms to the required ULC fire rated assemblies.

11. ACOUSTICAL MATERIALS

1. Install a continuous double row of caulking beads around perimeter of partitions which are indicated as containing sound attenuation batts.
2. Install sound attenuation batts in partitions where shown, with air space consistently on one side. Continue batts behind electrical boxes and conduits and all other services and items installed in partitions.
3. Provide caulking around all ducts, pipes, conduits and other items passing through partitions
4. Caulk all openings in wall and through base and ceiling plates for plumbing.
5. Electrical Outlets: cut holes neatly to reduce leaks. Caulk it tight around outlets before plate is installed. Do same for wall mounted fixture outlets before fixtures installed.
6. Bring early to General Contractor's attention that no electrical outlets are to be back to back in sound control walls. Consult Electrical Engineer.
7. Caulk edge of drywall to studs at perimeter of wall with 2 beads of caulking.
8. Installation of acoustical walls shall be from floor to bottom of floor above (not ceiling height) and sealed at all perimeters (including voids in metal deck).

12. FIRE STOPPING

1. Provide gypsum wallboard and furring as required to box in around steel joists at top of masonry and gypsum wallboard partitions including cross walls parallel to steel joists as per drawings.
2. All firestop sealants and backup mineral wool by Section 07270 - Firestopping and Smoke Seals.

**END OF SECTION**

**Part 1 - GENERAL**

1. GENERAL REQUIREMENTS

1. Division One is a part of this Section and shall apply as if repeated here.

2. DESCRIPTION OF SYSTEMS

1. Lay-in Tile System: Exposed suspended tee-bar system accommodating 2'-0" x 4'-0" (610 mm x 1220 mm), in areas as indicated drawings and reflected ceiling plans as acoustical tile ceiling.
2. All tile and suspension systems shall comply to U.L.C. Design as indicated on drawings.

3. SAMPLES

1. Submit for approval, two samples of each type of tile to be used in the project.

4. WORK INCLUDED

1. This contractor shall supply and install all acoustic tile and required accessories as indicated on the working drawings, room finish schedule, including the following:
  - .1 All non-combustible ceiling board.
  - .2 All exposed "T" grid suspension systems.

5. MAINTENANCE MATERIALS

1. Deliver acoustical units in packages for maintenance use amounting to 3% of gross ceiling area for each lay-in panel type. Store where directed. Clearly identify packages.
2. Maintenance materials shall be of same production run as installed materials.

6. ENVIRONMENTAL CONDITIONS

1. Commence installation only after building has been enclosed and dust generating activities have been completed.
2. Permit wet work to dry completely before commencement of installation.
3. Ensure that a uniform minimum temperature of 15 deg. C. and humidity of 20-40% before, during, and after installation is maintained.

7. LETTER OF CERTIFICATION

1. The Contractor, together with manufacturer, shall submit a written

confirmation, signed by manufacturer's registered professional engineer, stating that the suspended ceiling system will provide adequate support for electrical fixtures, as required by current bulletin of the ESA of Ontario Hydro. NOTE: all electrical fixtures to have independent supports in fire rated ceilings.

8. WARRANTY

1. Provide 10 year warranty on ceiling tiles for humidity and sag resistance.

**Part 2 - PRODUCTS**

1. Lay-in Tile System:

1. Hangers: Min. No. 12 (2.5 mm) SWG galvanized mild steel hanger wire - 24" (600 mm) o.c. or galvanized steel wire of size capable of safety supporting anticipated ceiling system and loading.
2. Tees: Armstrong Superfine 9/16" suspension Systems for square tegular tile system (Tech Zone)
  - .1 Main Tees: .021" (.53 mm) thick cold rolled steel, double web, with rectangular bulb section at least 1 1/2" (38 mm) high. Fabricate with punched cross tee holes at not greater than 16" (400 mm) o.c. and hanger wire holes at 2" (50 mm) o.c. Exposed flange shall be 15/16" (23.8 mm) wide and not less than .009" (.23 mm) thick cold rolled steel.
  - .2 Cross Tees: Double web design with rectangular bulb; web extending to form a positive inter lock with main tees in same exposed flange width.
  - .3 See lay-in panel types for width of Tees to be used with each tile type.
3. Accessories:
  - .1 Miscellaneous approved clips, splicers, screws, nails and other standard types to suit applicable conditions. Provide special accessories as required. Accessories shall be galvanized after forming.
  - .2 Standard edge moulding as manufactured by system manufacturer to suit applicable details. Moulding shall be formed of zinc coated steel.
  - .3 Provide Armstrong Impact Clip System Item No. 414 system at areas where clipped down ceilings are indicated on drawings and at all vestibule entrances. Provide accessible type clips where access is required.
4. Finish:

- .1 Tees, edge mouldings, and exposed accessories shall be finished with baked, non-yellowing, low sheen colour to match colour of lay-in panels.

5. Lay-in Panels:

- .1 Install tile types where acoustic tile is indicated on room finish schedule. Mineral tile types are as listed below:

!

- 1. **ACT1:** Fine Fissure 1729, Square Lay-in 15/16 grid- 24" x 48" x 5/8" (610mm x 1220mm x 16mm) with square lay-in edge detail as manufactured by Armstrong or equal by C.G.C. or Celotex. Colour to be White.

- 6. Tie Wire: 1.2 mm galvanized annealed steel wire.

- 7. Inserts and attachments to Structure for Hanger Connections: to suit conditions and loadings, galvanized after fabrication.

**Part 3 - EXECUTION**

1. WORKMANSHIP

- 1. Installation shall be by skilled mechanics and in strict accordance with system manufacturer's printed directions to produce a first class, flush finished surface in true plane and free from drooping, warped, uneven joints, damaged tile or panels. Butt joints tightly.
- 2. Consult with mechanical and electrical trades to co-ordinate and arrange work to accommodate recessed fixtures, diffusers, grilles, and other similar items, where indicated on mechanical and electrical drawings. Recessed items shall replace, or be centred in acoustical units.
- 3. Frame around recessed fixtures, diffusers, grilles and openings and where normally required in good standard practice.
- 4. Provide all furring required and construct drywall bulkhead, incorporated as part of best standard practice to Architect's approval.
- 5. Provide and install protection panels and/or five sided box enclosures at recessed lighting fixtures, speaker boxes, diffusers, duct openings, firestop flaps, etc. as specified in the applicable ULC assembly specification. Approval of enclosures and protection will be by Architect and/or Municipal Authorities.

2. ERECTION

1. Lay-in Tile System

- .1 Install ceiling suspension system to ASTM C636-76 and manufacturer's instructions, except where specified otherwise.

- .2 Supply hangers and inserts to support the grid in time to be installed in structural system if required.
- .3 Hangers for acoustic systems shall be spaced to comply to U.L.C. Design, approximately 4 ft. (1200 mm) centres both ways and where normally required in good standard practice.
- .4 Secure hangers firmly.
- .5 Erect carrying channels for suspended systems of required elevation and level to tolerance of 1/8" (3.2 mm) over 12 ft. (3650 mm). Frame around recessed fixtures, diffusers, grilles and openings and where normally required in good standard practice. Furr around ducts, beams, bulkheads or the like, as shown or required by U.L.C. Standard.
- .6 Ensure that the suspension system supports the completed assembly, including all superimposed loads, such as lighting fixtures, diffusers and grilles, with a maximum deflection of 1/360 of the span. Provide supplemental hangers within 6" (150 mm) of each corner and at maximum 2'-0" (610 mm) around perimeter of light fixtures.
- .7 Attach exposed tees at centres required in good standard practice.
- .8 Install expansion joints in all main beams as required by U.L.C.
- .9 Provide angle wall mouldings at junctions of ceilings and vertical surfaces.
- .10 Provide spring clips to ensure tight installation, in rooms having an area less than 20 sq. ft. (1800 mm<sup>2</sup>).
- .11 Provide lay-in tile and grid to meet fire rating at all fire rated ceilings.
- .12 Erect ceiling system at required elevation and level to tolerance of 1/8" (3 mm) in 12'-0" (3660 mm).
- .13 Cut reveal edges to match factory detail at all reveal edge lay-in ceiling that needs cutting to fit grid size.

### 3. FIXTURE SUSPENSION

1. Make provisions for carrying flush mounted and recessed fixtures on suspended ceilings, using 4 hangers per fixture. Consult and coordinate with Electrical and Mechanical Trades.
2. The suspended ceiling system must comply with the current bulletin from the Electrical Inspection Department of Ontario Hydro regarding "Lighting

Fixtures in Suspended Ceilings".

3. It is the responsibility of this contractor to supply the Architect with a letter stating that the suspension system is capable of holding the electrical fixtures as shown on the electrical drawings and as required by the above bulletin of the Electrical Inspection Department of Ontario Hydro.

4. MITRED JOINTS

1. "T" bar ceiling grid to be mitred at the outside corners.

5. ACOUSTICAL UNITS

1. Install acoustical units parallel to building lines to produce uniform borders and with edge units not less than 50% of unit width.
2. Accurately scribe and cut acoustical units to fit recessed items and adjacent work. Butt joints tight; terminate edges with moulding.

6. SPECIAL CLEANING

1. Keep acoustical panel installation and all components clean.
2. Remove and replace damaged or improperly installed units.

7. MECHANICAL EQUIPMENT ACCESS

1. Install "T" bar system to allow it to be removed easily at areas where mechanical units occur to allow units to be easily removed. NOTE: Stop main "T" on each side of equipment access.

8. IMPACT CLIPS

1. Install Impact Clip System at all acoustic tile ceiling areas indicated on drawings including rooms less than 20 sq. ft., (1800 sq. mm.) and all vestibules.

9. CERTIFICATION

1. Provide at completion of work a written certification that all ceiling conform to the requirements of the ULC design criteria for fire rated assemblies and that the suspended ceiling will provide adequate support electrical fixtures as per current bulletin of the ESA of Ontario Hydro.

**END OF SECTION**

**PART 1 - GENERAL**

1. GENERAL REQUIREMENTS:
  1. Division One is a part of this Section and shall apply as if repeated here.
2. SAMPLES:
  1. Submit full size tiles in duplicate, in each colour or design to be used, for approval of the Architect.
3. MAINTENANCE INSTRUCTIONS:
  1. Submit 3 copies maintenance manual at completion of work in accordance with Section 01015.
4. DELIVERY, STORAGE AND HANDLING:
  1. Deliver materials in original containers with manufacturer's seals and labels intact. Maintain temperature of storage area at 70°F (21°C) for 48 hours prior to installation.
5. ENVIRONMENTAL REQUIREMENTS:
  1. Maintain minimum 70°F (21°C) air temperature at flooring installation area during installation and for 72 hours prior to and until floor area is occupied by Owner.
6. MAINTENANCE MATERIALS:
  1. Leave 2% of each colour, type and size of tile installed, with Owner for replacement purposes. Clearly mark containers. Material shall be from same production run as the material installed.
7. PROTECTION:
  1. General Contractor's Responsibility: In each location immediately following installation, protect new floors, if work is to be done after flooring installed with heavy cotton reinforced paper or polyethylene taped at joints and maintain in place until Architect gives instructions for the removal of temporary protection. Work shall be handed over to the Owner free of blemishes and in perfect condition.

**PART 2 - PRODUCTS**

1. MATERIALS:
  1. VCT Primers and Adhesives: Environmentally friendly materials as recommended in writing by Flooring tile and base manufacturer, and approved by the Architect before application, to suit type of sub floor and wall finish for this project. Adhesive shall produce good and waterproof

bond between applicable substrate and tile. Use only Premier #71 by Flextile below all VCT or approved equal.

2. Sub-Floor Filler: Adrex SD-F Feather Finish TL 1000, TL Patch portland cement based filler by Ardex Engineered Cements and distributed by Brolain Distributors Ltd. (519-740-9311). Levelrock brand Super Smooth Patching Compound by C.G.C or Novoplan, Ultraplan 1 Plus, Ultraplan Easy are approved alternative products.
3. Sub-floor Filler and Leveller: White premix latex requiring water only to produce cementitious paste 2 part latex-type filler requiring no water as recommended by flooring manufacturer for use with their product.
4. VCT: - Vinyl Composite Floor Tile: 'Standard Excelon' series imperial texture composite floor tile by Armstrong only conforming to C.S.A. A126-1984. 12" x 12" x 1/8" thick (300 mm x 300 mm x 3.17 mm). Maximum 6 colours as selected by Architect. Accent colours to be selected by Architect from Manufacturer's standard range.  
Note colors below to be confirmed with Architect prior to ordering for installation:
  - .1 Field Base Colour VCT is 51899 Cool White.
  - .2 Accent colours labeled VCT2 to be selected from mfr. Range
5. Rubber Base: 1/8" (3.2 mm) thick, 4" (100 mm) as indicated, rubber cove base at resilient locations by Johnsonite. Colours as selected by Architect (max. 3 colours per school project). Use continuous coil rubber base not 4'-0" (1220 mm) lengths. Approved alternate manufacturers are Amtico and Roppe.
6. Cleaner: Neutral chemical compound as approved by tile manufacturers that will not damage tile or affect its colour.
7. Sealers and Waxes: Type recommended by flooring manufacturers for material type and location and shall be compatible with Owner's sealer and wax. Obtain Owner's approval of sealer and wax product prior to installing VCT.
8. Reducing Strip: strips in thickness as required. Colour as selected by Architect.
9. Metal Edge Trim: Aluminum or brass alloy with lip of edge extending under and with shoulder finishing flush with top of resilient flooring.
10. Concrete Floor Sealer: to C.G.S.B. 25-GP-20m Type 1.
11. Stair Tread Adhesives: Amtico No. 529 Epoxy (2 parts) or approved equal by Architect.

12. Tactile Walking Surface Indicator (TWSI) Rubber Tile: 12" x 12" x 1/8" (300mm x 300mm x 3mm (5mm where required to match the same thickness as adjacent adjoining flooring) rubber tile by Kinesik Engineered Products (905-330-9233). Tile to have truncated domes conforming to latest OBC requirements. Colour to be determined upon shop drawing review by architect prior to ordering. Approved alternate is Johnsonite Tarkett.
13. Reducers / Transitions: One piece homogeneous polyvinyl chloride, installed using materials and methods per Manufacturer's written installation instructions. Colour: from Manufacturer's complete line. Style: SSR-XX-B by Johnsonite Inc..

### **PART 3 - EXECUTION**

#### 1. INSPECTION:

1. Maximum surface tolerance: Ensure floor surfaces are smooth and flat to plus or minus 1/8" (3.2 mm) over 10 ft. (3050 mm).
2. Ensure concrete floors are dry by using test methods recommended by manufacturer, and exhibit negative alkalinity, carbonization or dusting. Ascertain nature of curing and/or sealing compound used on concrete and its compatibility with flooring adhesive. Take all required remedial measures. Remove compounds if necessary to ensure that adhesive bonds to concrete.
3. Installation of any part shall constitute acceptance of these surfaces as satisfactory.

#### 2. PREPARATION:

1. Remove sub floor ridges and bumps by light buff grind. Fill low spots, cracks, joints, holes and other defects with sub floor filler.
2. Clean floor and apply trowel and float filler to leave smooth, flat hard surface. Prohibit traffic until filler cured.
3. Split, bumpy or otherwise deformed tile resulting from improperly prepared base, will not be accepted.
4. Prime/seal concrete slab to resilient floor tile manufacturer's printed instructions.
5. Fill all low spots in flooring with high grade latex cement base flashing compound and gently blend in floor level at a rate of 1/8" per 1'-0" (10.5 mm per 100000 mm) to flush resilient flooring with ceramic tile, quarry tile, etc.
6. Power sand concrete floor smooth then dry vacuum clean entire floor area.

3. INSTALLATION - RESILIENT FLOOR TILES:

1. Apply adhesive uniformly to tile manufacturer's directions. Do not spread more adhesive than can be covered by tile before initial set takes place.
2. Lay flooring with joints and seams parallel to building lines to produce a symmetrical tile pattern unless noted otherwise. **Tile pattern shall be checkerboard type with all seams lined up in each direction and tile turned in opposite run directions to form checkerboard pattern.**
3. Install flooring with minimum tile width half full sizes.
4. Distribute tiles having varying tones or texture evenly over entire floor area to avoid patches or streaks, and to produce homogeneous blend. Reject tiles having undue variations in colour, shade and texture.
5. Make tile joints flush, uniform, in straight lines and as inconspicuous as possible.
6. Install tile and colours to form patterns indicated on 9 series drawings.
7. Set flooring in place, press with 100 lb. (45 kg.) minimum roller to ensure full adhesion.
8. Cut tile and fit neatly around fixed or excessively heavy objects.
9. Terminate flooring at centre line of door in door openings where adjacent floor finish is dissimilar.
10. Install metal edge strips at unprotected edges of flooring.
11. Use reducing strips at centre line below doors where resilient flooring meets concrete floor or quarry tile.
12. Allow for random pattern and border in each classroom

4. INSTALLATION – BASE:

1. Layout base to keep number of joints to a minimum.
2. Install straight and level to variation of plus or minus 1/8" (3.2 mm) over 10'0" (3050 mm) straight edge.
3. Fill cracks and level irregularities of surfaces to which base is to be applied with filler approved by adhesive manufacturer so as to provide solid backing over entire area behind base. Cement cove base to vertical surfaces so that gaps do not occur behind base, so that front lip of base cove bears firmly and uniformly on floor surface, and so that good and permanent bond is produced between base and surface to which it is

applied. Set base tightly in adhesive by using a 7 lb. (3 kg.) roller against wall and floor surfaces. Make end joints flush with gap.

4. Scribe and fit to door frames and other obstructions.
  5. Cope internal corners.
  6. Use full length pieces where possible. Accumulated short lengths at base not permitted.
  7. Supply straight base for carpeted areas and cove base for resilient flooring areas.
  8. Supply rubber base for all millwork bases.
  9. Gaps below bottom edge of base will not be accepted.
5. SPECIAL CLEANING AND WAXING OF VINYL COMPOSITION FLOOR TILE:
1. Clean off excess adhesive as work progresses from floor, base and wall surfaces without damage. Upon completion, remove all markings and heel scuffs.
  2. Upon completion of laying V.C.T., clean floors in accordance with manufacturer's printed instructions. Install two coats of sealer after installation and then three coats of wax.
6. PROTECTION OF FINISHED WORK:
1. Prohibit traffic on floor for 48 hours after installation.
  2. Protect floors as per item 1.7.1 in this Section.
  3. Clean floors and wax during final cleaning just prior to Owner occupying building.

**END OF SECTION**

**PART 1 - GENERAL**

1. GENERAL REQUIREMENTS

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

2. SUBMITTALS

1. Samples

- .1 Prepare samples of various finishes for Architect's approval either on site or by submitting samples as directed, at least thirty days before materials are required. Submit samples in triplicate on 8" x 12" (200 mm x 300 mm) material. Identify each sample as to job, finish, formula, colour name, number, sheen name and gloss units, date and name of Subcontractor.

3. PRODUCT HANDLING

1. Delivery and Storage

- .1 Deliver materials to site in their original containers with label intact and store in spaces directed by Architect. Keep stored materials covered at all times and take all necessary precaution against fire.
- .2 Provide CO2 fire extinguisher of minimum 20 lbs. (9 kg.) capacity in storage area.

4. ENVIRONMENTAL CONDITIONS

1. Do not paint or finish in unclean or improperly ventilated areas. Do not paint in temperatures lower than 50 degrees F. (10 degrees C.) or varnish in temperatures lower than 65 degrees F. (18 degrees C.) for 24 hours before, during and 48 hours after application.
2. Do not undertake exterior painting at temperatures under 50 degrees F. (10 degrees C.) for 24 hours before, during and 48 hours after application or immediately following rain, frost or dew. Safe levels shall be determined by use of an electronic metre.
3. Test for moisture content in each location immediately before commencing application of paint. Do not apply paint on surfaces where moisture content exceeds 14%. Promptly notify Consultant if such conditions are encountered.
4. Provide approved equipment for testing moisture content of surfaces to receive paint finishes and have available on Site at all times during Work of this Section.

5. Do not apply paint finish in areas where dust is being generated.

5. PROTECTION

1. Provide metal pans or adequate tarpaulin to protect floors in areas assigned for the storage and mixing of paints.
2. Use sufficient drop cloths and protective coverings for the full protection of floors, furnishings and work not being painted.
3. Leave above areas clean and free from evidence of occupancy upon completion of painting.
4. Protect paint materials from fire and freezing.
5. Keep waste rags in metal drums containing water and remove from building at end of each working shift.

6. RELATED WORK SPECIFIED ELSEWHERE

1. Read carefully all other Sections of the specifications to determine the extent of prime and finish coats applied by others.
2. See Division 15 - Mechanical and 16 - Electrical, for extent of baked enamel finish on equipment.

7. SCOPE OF WORK

1. With exceptions noted in 1.6 and 1.7 above or specifically called for in other Sections of the Specification, all paintwork is included in the scope of this Section
2. NOTE: In locations where Drawings do not call for paint or similar finish on walls and/or ceilings, the intent of this Specification is that all exposed unpainted metal surfaces shall be painted.
3. Paint exposed drywall and the like in locations where finish is not otherwise specified or noted. Do not paint such surfaces in mechanical shafts, unless specifically noted.
4. In locations where Drawings do not call for paint or similar finish on walls and/or ceilings, the intent of this Specification is that items such as new work, including miscellaneous metal work, shall be painted.
5. Do not paint pipe, conduit, ducts, insulation and the like where concealed above ceilings (except louvred type ceilings) or in service shafts.
6. Make good paint finish on shop coated work where damaged.
7. Paint visible portions of steel shelf angles, lintels and structural steel.

8. Paint all edges and all faces of doors where primed for paint supplied.
9. Allow for three (3) different paint colours to be used in the building - including field, accent walls and bulkheads.

8. QUALITY ASSURANCE AND REFERENCES

1. Paint work shall meet or exceed standards set out in C.G.S.B. Specification No.'s 85-GP-1M to 85-GP-33A and C.P.C.A. Canadian Painting Contractors Association - Painting Manual.
2. Employ fully trained workers who are regularly employed in this field.
3. Manufacturer's sales representative shall perform inspections on the Owner's behalf in order to ensure compliance with product specifications.

9. RETOUCHING

1. Do all retouching, etc. to ensure that the building may be handed over to the Owner in perfect condition, free of spatter, finger prints, rust, watermarks, scratches, blemishes or other disfiguration.

10. TEST AREA

1. A room or area in the building will be designated by the Architect as a test area to establish standard of workmanship, texture, gloss and coverage.
2. Prior to any painting being started, request a meeting on Site between Architect, Contractor, Subcontractor and Material Manufacturer's Representative to review conditions, surfaces, anticipated problems and to clarify quality of workmanship acceptable to Architect.
3. Apply finishes to each type of surface within room with correct material, coats, colour, texture and degree of gloss in sample area and have same approved prior to providing Work of this Section.
4. Retain test area until after completion of Work. Test area to be minimum standard for the Work.
5. Failure to comply with the above will be cause for Architect to request all Work previously painted to be repainted.

**PART 2 - PRODUCTS**

1. MATERIALS

1. "Top Line" products only are acceptable. Use only products of manufacturers whose best quality lines meet or exceed CGSB Specifications for the particular type of material required. Approved

manufacture and product unless specifically indicated otherwise in specification:

- .1 Paints, stains and varnish:
  1. General Paint
  2. Benjamin Moore
  3. Sherwin Williams
  4. Zinsser
  5. Glidden/Devoe Coatings
- .2 Latex Water Based Epoxy
  1. Sherwin Williams B70W00211 - Waterbased catalyzed epoxy extra white/  
Tint base A/B60V00025 - Waterbased Catalyzed epoxy Semi Gloss Hardner Part B
  2. Glidden - 4420 - True Glaze Waterborn epoxy / 4426 True Glaze semi gloss converter
- .3 Latex Supper Adherent Primer,
  1. General Paint 51-050 Premium Latex Plastic Primer
  2. Benjamin Moore #23-00 Freshstart Acrylic Primer Sealer
  3. Zinsser 1-2-3 Acrylic Primer Sealer
  4. Sherwin-Williams - B51WQ8850 - Adhesion Prm White
  5. Glidden Latex super undercoat 94280
- .4 Interior Latex Block Filler, C.G.S.B. Standard #-GP-188M
  1. General Paint 70-224 Premium Latex Block Filler
  2. Benjamin Moore #595-01 Latex Block Filler
  3. Glidden #362650 Concrete Block Filler
  4. Sherwin-Williams B42W00046 Heavy Duty Block Filler
- .5 Stain Suppressant Sealer/Primer Hi-Hide, C.G.S.B. #1-GP-119M (where required)

1. General Paint 60-200 X-Terminator 2 Latex Sealer
2. Zinsser BIN Primer, hi-hide (spot prime only)
3. Zinsser Bullseye Odourless
4. Sherwin-Williams - B49WQ8820 Multipur LTX Pr Wh
5. Glidden/Jammer 200
- .6 Thinners, cleaners: Type and brand recommended by the paint manufacturer.
- .7 Materials to be new and first line of manufacturer.
- .8 Deliver materials to site in original unbroken containers bearing brand and manufacturer's name.

### **PART 3 - EXECUTION**

#### 1. CONDITION OF SURFACES

1. Check all surfaces with electric moisture metre and do not proceed if reading is higher than 12-15 without written permission from Architect.
2. Proceed with work only when surfaces and conditions are satisfactory for production of a first class job.
3. Clean and remove dust, grease, rust and extraneous matter from all surfaces (except that rust occurring on items specified to be primed under other sections shall be removed and worked reprimed under these sections).
4. The commencing of work in a specific area shall be construed as acceptance of the surfaces, and thereafter the contractor shall be fully responsible for satisfactory work as required herein.
5. All surfaces shall be prepared in accordance with Chapter 2 for Interior Work of the Master Painters and Decorators Association Painting Manual latest edition.
6. Prepare surfaces in accordance with paint covering manufacturer's instructions.

#### 2. PREPARATION

##### 1. Concrete and Masonry

- .1 Test surfaces for alkalinity with pink litmus paper or other recognized method.

- .2 Where extreme alkalinity occurs, wash surface with 4% solution tetrapotassium pyrophosphate (5 oz. per gallon (31 ml./l.) of water) where latex base paint is to be used and with zinc sulphate solution (3 lbs. per gallon (300 g./l.) of water where other paint bases are to be used.)
- .3 Etch normal concrete surfaces to receive alkyd paint with muriatic acid solution (1 part commercial) 31.45% to 3 parts water. Neutralize and allow to dry before painting.
- .4 Prepare masonry concrete surfaces to CGSB 85-GP-31M.

2. Metal

- .1 All metal surfaces to receive coatings shall be cleaned to SSPC-SP1 (solvent washing) prior to painting as specified herein.
- .2 Touch-up shop primed metal after first removing loose primer, rust, oil, grease and other contaminants.
- .3 All metal surfaces exposed and/or exhibiting rust shall be cleaned to SSPC-SP2 or SSPC-SP3 standards and primed with an approved rust inhibitive primer prior to recoating as specified.
- .4 Feather edges to make touch-up inconspicuous when applying new primer.
- .5 Conform to CGSB 1-GP40d.M to CGSB 85-GP-14M.

3. Galvanized Surfaces

- .1 For Primer Application Type C Corrosive ensure that all surfaces to be painted are clean, dry, and free of all contaminants.
- .2 Cleaning of existing surfaces to be conducted according to SSPC-SP-4 Flame Cleaning procedure. Pass high temperature, high velocity, oxyacetylene flames over entire surface and then wire brushing. Primer is to be applied before surface is cool.
- .3 Phosphatize galvanized metal surfaces using CGSB 31-GP-105M pretreatment or prime with galvanized metal primer.

4. Hardware

- .1 Remove finishing hardware, electric cover plates and accessories, mask any that are not removable. Replace these when paint is dry and clean them. Do not clean hardware with solvent that will remove permanent lacquer finish.

5. Gypsum Wallboard

- .1 For small holes, scratches or other surface marks fill with patching compound and sand smooth.
- .2 For larger holes or damaged areas do not proceed until trade for original work has filled or repaired surfaces to acceptable levels.
- .3 Prepare wallboard surfaces to CGSB-85-GP-33M.

6. Copper

- .1 Prepare copper piping and accessories to CGSB 85-GP-20M.

7. General

- .1 Mask specification plates occurring on equipment, switch boxes, and similar items requiring painting.
- .2 Protect, remove and replace hardware, accessories, lighting fixtures and similar items as required.
- .3 Conform with Architect's colour schedules and exactly match approved samples.

3. APPLICATION

1. Finishes and number of coats specified in the schedule are intended to cover surfaces perfectly. If they do not, apply further coats until perfect coverage and colour are achieved as required.
2. Any areas exhibiting incomplete or unsatisfactory coverage shall have the entire plane painted. Patching will not be acceptable.
3. Walls needing repainting, entire wall (plane) shall be painted to the satisfaction of the Architect. See drawings for extent of work.
4. Spray painting will not be permitted (except at metal deck and joist areas) unless specifically approved in writing by the Architect in each instance. Architect may withdraw approval at any time and prohibit spray painting for reasons such as carelessness, poor masking or protection measures drifting paint fog, disturbance to other Trades or failure to obtain a dense, even, opaque finish. Spray painting shall be full double coat, i.e. at least two passes for each coat. Do not use spray or roller on wood or metal surfaces, brush only unless approved in writing by Architect. Spray painting and backroll may be permitted on concrete blocks.
5. Arrange to have traffic barred from completed areas wherever possible.

6. Apply materials in strict accordance with manufacturer's directions and specifications and be familiar with these directions and specifications.
7. Prime woodwork as soon as possible after woodwork is delivered to site. Prime all surfaces, whether exposed or not, before installation. In case of woodwork which is to be stained, apply one coat of penetrating sealer to all finish surfaces of wood having uneven absorption, such as birch. Woods of uniform density such as oak shall be left unsealed. Back prime stained and varnished woodwork with one coat of gloss varnish reduced 25%. Fill open grain woods with filler tinted to match wood when transparent finish is required, and work well into grain. Before filler sets, wipe excess from surface.
8. Apply primer-sealer coats by brush or roller method. All primers and undercoats to be tinted to no more than 25% of intensity of the finish colour.
9. Permit paint to dry before applying succeeding coats, touch up suction spots and sand between coats with No. 00 sandpaper.
10. Where two coats of the same paint are to be applied, the first coat shall be the same colour as the finish coat and be inspected by the Architect before application of final coat, to allow the Architect to make reasonable modification of colour if necessary. Furnish Architect 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.
11. Exterior paints and deep/intense interior and exterior colours shall be from the nearest factory premixed colour selection and shall be alterable to match required colours.
12. Flat and semi-gloss finishes on gypsum wall board, block and other surfaces of large areas shall be applied by roller and to all other surfaces applied by brush.
13. Paint shall be uniform in sheen, colour and texture, free from brush or roller marks, sags, runs or other defects.
14. Finish edges of doors (top, bottom, sides and cutouts) with paint or stain treatment as required to match face of door. Stain top and bottom edges a different colour and seal with one coat of shellac and one coat gloss varnish or two coats paint. Refinish tops and edges of wood doors after fitting.
15. Even up stained woodwork in colour as required by nature of wood and as directed by Architect. Apply same finish on trim, fitments, cupboards and other protecting ledges as on surrounding work, disregard sight lines.
16. Carefully hand smooth and sandpaper wood between coats (including

- priming). Apply one coat sealer before applying first coat paint filler to knots or sap blemishes on wood surfaces to receive paint or stain finish.
17. Remove rust, oil, grease and loose shop paint from metal work by brushing or with wire brushes and make good shop coat before proceeding with final finish. Feather out edges to make touch up patches inconspicuous.
  18. After first coat, fill nail holes, splits, and scratches, using putty coloured to match finish.
  19. Clean castings with wire brush before application of first paint coat.
  20. Do not etch galvanized metal. Prepare prime and paint elsewhere in this section. This includes metal door frames and the like with wiped zinc coating.
  21. Remove form oil or parting compounds from concrete surfaces. Use Xylol or approved compound.
  22. Paint interior of pipe spaces, ducts, etc. visible through grilles or through metal ceilings in black matt finish.
  23. Conform with Architect's colour schedule and exactly match approved samples.
  24. Mechanical and Electrical Materials
    - .1 Refer to Mechanical and Electrical Sections of the Specifications and note the instructions regarding painting and finishing of materials and equipment supplied and installed by those trades.
    - .2 Remove grilles, covers, access panels for mechanical and electrical systems from location and paint separately, if these items are not factory finished.
    - .3 Paint work to match adjacent walls and ceilings unless directed otherwise. Note: This includes trim on fixtures exposed, speaker covers, emergency lights, grilles, diffusers, louvres, vents, fire extinguisher cabinets, electrical panels, etc.
    - .4 Paint interior surfaces that are visible through grilles and louvres with one coat of flat black metal paint to limit of sight line.
    - .5 Where walls and ceilings are not scheduled to be painted, the work described above shall be painted a colour selected by Architect.
    - .6 Unless factory painted, all exposed piping, conduits, ductwork hangers, insulation and mechanical equipment shall be painted.
  25. Rooms without finished ceilings will have decks, joists, beams, ducts, etc., painted.

26. Paint graphics as shown on drawings. All graphics to be semi-gloss minimum two coat application.

4. ADJUST AND CLEAN

1. Cracks occurring in walls or ceilings requiring patching during "warranty period" shall be repainted in such a way that the patch is not visible at a distance of 5'-0" (1500 mm).
2. If patch painting not acceptable repaint entire wall or ceiling surface.
3. At completion clean entire area of surplus materials and equipment.

5. FIELD QUALITY CONTROL

1. Locate testing area in building to establish standard of workmanship, texture, gloss and coverage where designated.
2. Apply samples of all finishes on each type of surface to be coated with correct material, number of coats, colour, texture and degree of gloss required.
3. Retain test area until completion of work. Use approved work in test areas as standard for corresponding work throughout building. Correct and refinish work which does not compare with approved finishes.

6. FINISH SCHEDULE

1. General

- .1 Finish the listed exposed surfaces, wherever they occur unless such surfaces are specifically noted to be left unfinished.
- .2 Exposed means visible in the completed work and includes the interior of closets, cabinets and drawers.
- .3 The Architect shall have the option of having wood painted or with transparent finish and of which finish shall be used.
- .4 In instances where materials specified are not suitable for a particular job application, or are contrary to manufacturer's recommendations for use on a particular surface, such condition shall immediately be brought to the attention of the Architect for clarification and instructions.
- .5 Finishes shall match approved samples but Architect reserves the right to make reasonable changes to finish specifications to obtain desired results without additional cost or obligation of Owner.

- .6 A colour chart giving colour schemes for various areas will be prepared after tendering, by the Architect. The final selection of colours and surface textures of all finishes throughout and whether finishes are transparent (natural) or opaque (paint) shall rest solely with the Architect.
- .7 Where surfaces have been disturbed the entire plane shall be painted.

2. Exterior Schedule

- .1 Metal (Ferrous): One coat rust inhibitive primer (metal surfaces already primed need not receive a field prime coat except for touch up). Two coats exterior Aura paint by Benjamin Moore.

Note: All roof top equipment, pipes, conduit, vents, ducts, grilles, pipe insulation, etc. to be painted.

- .2 Galvanized Steel: One coat galvanized primer. Use a Polyamide converted epoxy primer by Devoe Coatings, "4170-1000 with 4170-999 - catalyst". Two coats of galvanized Finish Coat. Use a single package tough, durable alkyd modified urethane coating with water, chemical and solvent resistance by Devoe Coatings "Devoe" Glid Shield Urethane Gloss Enamel No. 4328-0100 Series (installation within 72 hours of installing primer).

Note: All exterior areas are to be painted including stairs, masonry lintels, etc.

- .3 Painted Wood Surfaces: One coat wood primer. Two coats exterior Aura paint by Benjamin Moore.
- .4 Stained Pressure Treated Wood or Cedar: Two coats solid hide Aborite stain and one Clear Top Coat both by Benjamin Moore.

3. Interior Schedule

- .1 Metal (Ferrous): One coat latex super adherent primer (metal surfaces already primed need not receive a field prime coat except for touch up). Apply two coats latex water based epoxy 2 coats.
- .2 Hot Ferrous Metal - (Valve bodies, strainers, etc., on high temperature lines.) - One coat primer, latex super adherent heat resistant - Two coats latex water based epoxy.
- .3 Galvanized Steel: One coat galvanized primer. Use a Polyamide converted epoxy by Devoe Coatings "4170-1000 with 4170-9999-catalyst". Two coats of galvanized Finish Coat. Use a single package tough, durable alkyd modified urethane coating

with water, chemical and solvent resistance by Devoe Coatings "Devoe Glid Shield Urethane Gloss Enamel No. 4328-0100 Series (install within 72 hours of installing primer).

- .4 Hollow Metal Doors, Metal Ducts, etc.: One coat super adherent primer. Two coats latex water based epoxy.
- .5 Concrete Block (Base Price): One coat latex block filler, applied at the minimum rate of 80 sq. ft per gallon (1.63 m<sup>2</sup> per litre), or as required by block texture to completely fill block. **Pinholes will not be accepted.** Apply more block filler if necessary to completely fill the block before applying finish coats. Note that lightweight block requires more block filler to fill than standard weight block does and adjust application rate as required. Two coats interior Latex Semi-Gloss "Ultra 94800" by Glidden.
- .6 Concrete Block (Alternate Price Products): One coat latex block filler. Pinholes will not be accepted, apply additional coats as required to fill pinholes. Two coats latex water based epoxy.
- .7 Exposed Insulated Pipes and Ductwork: One coat size. One coat super adherent primer undercoat. Two coats Ultra "94800" by Glidden eggshell.
- .8 Gypsum Wallboard (Base Price): One coat of Latex super adherent primer.. Two coats semi gloss Ultra "94800" by Glidden. Velvet or eggshell at walls and Low gloss at ceilings.
- .9 Surfaces Behind Grilles and Duct Work Where visible Within 12' (300 mm) of Grille:
  1. Two coats vinyl latex matt black.
- .10 Painted Light Trims, Emergency Lights, Louvres, Diffusers, Vents, Concealed Sprinkler Covers, Fire Extinguisher Cabinets, and Electrical Panels, Etc.
  1. One coat super adherent primer. Two coats Ultra "94800" by Glidden to match surrounding wall and ceiling colours or as specified by Architect.
- .11 Exposed Sealed Concrete Floors to be Painted
  1. One coat Sikafloor 2001 Primer
  2. One coat Sikafloor polyurethane UV in colour as selected by Architect from complete colour range.
  3. Install floor primer and finish coat as per manufacturer's printed installation instructions.

.12 Flame Retardant Coating at Corridor Wood Ceiling and Wall Panels:

1. One coat stain filler. One coat sanding sealer. Two (4 mil) coats Safe Coat Clear Fire Retardant Coating for a total min. 8 mil thickness.

.13 General Notes

1. See drawings for locations of areas where more than one colour occurs on one wall and one ceiling plane.
2. Door frames may be one colour and door another colour.

7. MAINTENANCE MATERIAL

1. Provided one sealed can of four litre capacity, of each product in each colour used in the Work for Owner's use in maintenance work.
2. Container to be new fully labelled with manufacturer's name, type of paint, and colour.
3. Provide Owner 3 copies of paint formula for each colour and type of paint for Owner's maintenance manual.

**END OF SECTION**

**1. GENERAL**

1. GENERAL REQUIREMENTS

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

2. SHOP DRAWINGS

1. Submit shop drawings in reproducible vellum form in accordance with GC. 3.11 of CCDC Document 2 - 2020.

1. MAINTENANCE MANUALS

1. Provide maintenance brochures for insertion in maintenance manual in accordance with Section 01300.

1. SCOPE

1. Provide whiteboards and tack boards, complete with marker trays in sizes and locations where indicated on drawings.

**2. PRODUCTS**

1. MATERIALS

1. Whiteboards: "Rite-on, Wipe Off" Vit-Rite boards by Architectural School Products. The board surface shall be porcelain enamel on steel.
2. Tackboards: Natural cork, fine grain, 1/4" (6.35 mm) thick Bulletin Board.
3. Plywood: Fir Plywood conforming to C.S.A. 0121.
4. Adhesive: Type recommended by chalkboards and tack board manufacturers.
5. Trim: Series 9300 extruded aluminum trim 3/4" (19 mm) as manufactured by Architectural School Products Ltd. Finish to be clear anodized aluminum. Provide head, jamb and sill section as recommended by manufacturer.
6. Marker Pens for Marker Boards: Dry Erase Marker Pens as supplied by Architectural School Products or Equal 4 Colours - Black, Purple, Green, and Red. Provide 48 boxes of 4 assorted markers in each box and 48 boxes of black markers with 4 in each box. Dry Erase Marker Pens for Owner's start up.

2. APPROVED EQUAL MANUFACTURER'S:

1. Global School Products Inc. are approved manufacturers of the products specified in this section.

**3. EXECUTION**

1. INSTALLATION

1. Install tackboards and 2" (50 mm) ht. tackstrips in sizes and locations indicated on drawings all in accordance with manufacturer's directions. Review heights of tackboards to be installed over existing millwork with Architect and Owner prior to installing. Coordinate installation to avoid conflict with any adjacent millwork.
2. Mitre corners of trim with tight fitting hairline joints.
3. Install tackboards in a single piece without joints. Factory laminate tackboards to 1/4" (6.35 mm) plywood with adhesive.
4. Mechanical Attachment Only:
  1. To concrete or solid masonry use lag screw and expansion bolts or screws and fibre plugs as appropriate for stresses involved.
  2. To hollow masonry use toggle bolts or equivalent.
  3. To wood or sheet metal use screws secure into framing members in stud walls.
  4. Do not adhere tackboards to any walls.

**END OF SECTION**

**1. GENERAL**

1. GENERAL REQUIREMENTS

1. Division One - General Requirements are part of this section and shall apply as if repeated here.

2. SUBMITTALS

1. Submit shop drawings in reproducible vellum form in accordance with GC 3.10 of CCDC Document 2-2020.

3. SPECIAL PROTECTION

1. Provide adequate protection of materials and work of this Section from damage by weather and other causes.
2. Protect the work of other Subcontractors from damage resulting from work of this Section. Make good such damage to the satisfaction of the Consultant.

4. WARRANTY

1. Extend the warranty for work of this section to a period of two years, covering material and workmanship but not to include damage due to vandalism.

**2. PRODUCTS**

1. CONCRETE STAIR NOSING

1. Wooster Type WP-RN2-SP with black (BL-1) supergrit two stage stair nosing with sure hold anchor cast into concrete. Contractor to ensure the nosing does not project past the face of the riser. Contractor to provide wood insert during construction.

2. INTERIOR VISION STRIPS (ADHESIVE VINYL FOR GLASS)

- a) Materials: typical sand-blasted aesthetic, adhesive vinyl applied to inside surface of glass (final colour selection to be from highly contrasted samples with surface environment and to be selected by Architect prior to ordering.
- b) Decals (vision strips) shall be applied to inside of glazing at two heights/rows (where each row consists of two lines as shown on drawings) with centre line of each row located at 1200mm and 1500mm from finish floor, at all fully glazed screens, side lights and glass walls and all other locations indicated on drawings.

**3. EXECUTION**

1. INSTALLATION

1. Delivery to the job site shall be coordinated by General Contractor.
2. Coordinate with mechanical and electrical for final connection
3. Install at locations indicated on drawings all in accordance with manufacturer's directions.

**END OF SECTION**

## **ELECTRICAL SPECIFICATION**

**FOR**

**ST. ANNES C.E.S.**

**250 EAST AVE.**

**KITCHENER, ONTARIO**

**OUR PROJECT NUMBER:**

**26009.001.E.001**

**DATE:**

2026-03-26

**ISSUED / REVISION:**

ISSUED FOR PROGRESS REVIEW – REV 01

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SCHEDULES

PAGES

END OF SECTION

26 01 00.00 Operating and Maintenance Instructions

1. General

1.1. WORK INCLUDED

1.1.1. Section 26 05 01.00 – GENERAL INSTRUCTIONS FOR ELECTRICAL SECTIONS.

1.1.2. Section 26 05 03.00 – AS-BUILT DRAWINGS.

1.1.3. Section 26 05 04.00 – SUBMITTALS/SHOP DRAWINGS.

2. Products

2.1. NOT USED

3. Execution

3.1. REQUIREMENTS FOR MANUALS

3.1.1. A minimum of three copies of complete and approved operating and maintenance instructions for all electrical equipment and systems shall be supplied before Substantial Performance of the Work. Provide additional copies if required under the General Requirements. In addition to the three copies of manuals, the contractor to provide a manual in a searchable PDF format on USB stick or sent via electronic transfer. As-Built Drawings to be included on the USB stick or sent via electronic transfer.

3.1.2. The contractor to identify the cost of AS-BUILT DRAWINGS and the Operation and Maintenance Manuals as a separate line item on their progress draw. The values to be broken out can be found in Section 26 05 03.00 – AS-BUILT DRAWINGS. The project will remain incomplete and no money will be released until the final versions, both hard and electronic, of the drawings and manuals are received and reviewed without comments.

3.1.3. Binders shall be three-ring, hard-cover, loose-leaf type and identified on the binding edges as "Maintenance Instructions and Data Book", for "St. Annes CES 2026 Renovations."

3.1.4. Terminology used in all the sections shall be consistent.

3.1.5. Volume One shall contain the master index of all systems, the name of the Contractor, Electrical Subcontractors and the date of Substantial Performance of the Work.

3.1.6. Volume One shall contain a section with all necessary warranty information.

3.1.7. Each binder shall have a complete index for all volumes.

3.1.8. Each binder shall be no more than half filled.

3.1.9. There shall be a separate section for all materials used on the project which fall under the WHMIS legislation. There shall be Material Safety Data Sheet (MSDS), hazard data sheet, for each of the materials.

3.1.10. There shall be a separate section for all Insurance Certificates, Test Certificates, Verification Forms and Test Forms.

3.1.11. All relevant information relating to a system or product shall be contained within one binder.

3.1.12. The manual sections shall follow the specification sections.

3.1.13. Any diagrams, installation drawings, single line diagrams charts, etc. shall be mechanically reduced while maintaining full legibility to standard page size. If this cannot be achieved, they shall be carefully folded and contained within a clear plastic wallet within the manual.

### 3.2. DATA FOR MANUALS

3.2.1. Equipment data shall contain:

- .1 Operating instructions.
- .2 Operating conditions such as temperature and pressure.
- .3 Location of equipment.
- .4 Maintenance instructions and schedules for one-year routine.
- .5 Recommended list of spare parts.
- .6 Maintenance schedule.
- .7 A trouble shooting table showing where to look for problems under various conditions of malfunction.
- .8 All wiring diagrams.
- .9 Equipment operating curves.
- .10 Equipment nameplate data and serial numbers.

3.2.2. System data shall contain:

- .1 A listing of all systems.
- .2 All panel, mcc and fire alarm schedules and locations.
- .3 Equipment name tags.
- .4 Cleaning, maintaining and preserving instructions for all material, products and surfaces. Include warnings of harmful cleaning, maintaining and preserving practices.

3.2.3. Sub-Contractor manuals are required for:

- .1 Switchboards and power distribution systems.
- .2 Lighting systems.
- .3 Emergency power systems.
- .4 Fire alarm systems.

3.2.4. As-Built documentation shall contain:

- .1 Reviewed As-Built Shop Drawings.
- .2 As-Built Construction Drawings.
- .3 Originals of test forms.
- .4 Originals of test certificates.
- .5 Cyber Security Report Letter and backup schedule as required by Section 26 05 01.00 – GENERAL INSTRUCTIONS FOR ELECTRICAL SECTIONS.

### 3.3. OPERATING INSTRUCTIONS

3.3.1. Instruct the Owner's representative in all aspects of the operation and maintenance of systems and equipment.

3.3.2. Instruct the Owner for a minimum of five (5) working days.

3.3.3. All instruction sessions to be video-taped and copy must be provided to the Engineer's Representative/owner.

- 3.3.4. Arrange for and pay for the services of engineers and other manufacturers' representatives required for instruction on the systems and the equipment as requested by the Engineer's Representative and/or the Owner.
- 3.3.5. At the time of final review, provide a sheet for each system and piece of equipment showing the date instructions were given. Each sheet shall show the duration of instruction, name of persons receiving instruction, other persons present (manufacturer's representative, Engineer's Representative, etc.), system or equipment involved and signature of the Owner's staff stating that they understood the system installation, operating and maintenance requirements. This information shall be inserted in the manuals after all instructions have been completed.
- 3.3.6. Review information with the Owner's representative to ensure that all information required has been provided.
- 3.4. TRIAL USAGE
- 3.4.1. The Owner shall be permitted trial usage of systems or parts of systems for the purpose of testing and learning operational procedures. Trial usage shall not affect the warranties nor be construed as acceptance, and no claim for damage shall be made against the Owner for any damage or breakage to any part or parts due to the tests, where such injuries or breakage are caused by a weakness or inadequacy of parts, or by defective materials or workmanship of any kind.

END OF SECTION

26 05 01.00 General Instructions for Electrical Sections

1. General

1.1. WORK INCLUDED

1.1.1. Conform to the requirements of Division 1, which applies to and forms part of all sections of the work.

1.2. DESCRIPTION OF SECTION

1.2.1. The specification is divided into sections of work and a section may consist of the work of more than one subcontractor. The responsibility as to which electrical subcontractor provides labour, materials, equipment and services required to complete the work rests solely with the Electrical Contractor.

1.3. SECTIONS AFFECTED

1.3.1. These instructions apply to and form a part of all electrical sections.

1.4. DEFINITIONS

1.4.1. Where used on the Drawings or in the Specifications, the following words are given the meanings below.

- .1 Provide: means supply, install, connect, and test.
- .2 Demolish: detach existing items and legally dispose of them off site.
- .3 Remove and Reinstall: Detach existing items, prepare them for reuse, and reinstall them where indicated.
- .4 Existing to Remain: existing items that are not removed and that are not otherwise indicated as being removed, removed and salvaged (turned over to Owner), or removed and reinstalled.
- .5 Remove and Salvage: detach existing items and turn over to Owner.

1.5. SCOPE

1.5.1. Provide all labour, materials, equipment and services to complete the work of the electrical division as further specified and as shown on the drawings.

1.5.2. Should any discrepancy appear between any parts of the specifications and/or the drawings to cause doubt as to the true meaning and intent of the drawings and specifications, a ruling shall be obtained from the Engineer's Representative before submitting the tender. If this is not done the following will be assumed:

- .1 Where a discrepancy occurs between the specification and the drawings, the more expensive/onerous alternative will be deemed as included in the contract.
- .2 Where a discrepancy occurs in the drawings the more expensive/onerous alternative will be deemed as included in the contract.
- .3 Where a discrepancy occurs in the specifications the more expensive/onerous alternative will be deemed as included in the contract.

- 1.5.3. For any equipment/device where circuit numbers and/or panel designation labels are missing and not indicated on the drawings or specifications, a clarification shall be obtained from the Engineer's Representative before submitting the tender. If this is not done the Contractor shall power the equipment/device from the respective 120 V/208 V or 600 V electrical panel serving the equipment in that area at no additional cost to the Owner.
- 1.6. REGULATIONS
- 1.6.1. All work shall be performed in accordance with the latest codes, rules, regulations, by-laws and requirements of all authorities having jurisdiction except where the requirements of the drawings and specifications exceed the codes, rules, regulations, by-laws and requirements of the authorities having jurisdiction.
- 1.6.2. These specifications are supplementary to the requirements above.
- 1.6.3. Comply with all guidelines and standards issued by the authorities having jurisdiction.
- 1.6.4. Drawings and specifications should not conflict with the above regulations but where there are apparent discrepancies the contractor shall notify the Engineer's Representative.
- 1.7. PERMITS, FEES, AND REVIEWS
- 1.7.1. Make submissions to obtain all permits. Include for and pay for all fees and arrange for all reviews required for the work of this division.
- 1.7.2. If required by code, plans and specifications have been previously submitted to the Authority Having Jurisdiction.
- 1.7.3. Furnish certificates of Acceptance from the Authority Having Jurisdiction and include them in the Operation and Maintenance manual.
- 1.8. VOLTAGE RATINGS
- 1.8.1. Operating voltages are as specified in CAN3-C235 (latest edition).
- 1.8.2. Motors, electric heating, control and distribution devices and equipment are to operate satisfactorily at 60 Hz within operating limits established by the above standard.
- 1.9. COORDINATION WITH MECHANICAL DIVISIONS.
- 1.9.1. Unless indicated otherwise on the Electrical Drawings, Electrical Contractor will be responsible for the supply and installation of the following:
- .1 Starters.
  - .2 Line and load side wiring for starters.
  - .3 Reduced voltage starters including "Soft Start" starters.
    - .1
  - .4 Disconnect switches for all mechanical equipment.
  - .5 All power wiring (120 V & above) to all mechanical equipment.
  - .6 All motorized damper power connections (120 V & above).
  - .7 Fire alarm devices.
  - .8 Wiring to electric space heaters.
- 1.9.2. Mechanical Divisions will be responsible for the supply and installation of the following:
- .1 Electric hot water heaters.

- .2 All electrical heaters including baseboard heaters, cabinet heaters, force flow heaters and radiant heaters.
  - .3 All interposing relays, relays, contactors and 120 V control devices.
  - .4 All 120 V and low voltage control wiring and conduits.
- 1.9.3. Should the Mechanical Contractor change any of the motor or equipment sizes from those identified on the Mechanical Schedules and Drawings at any stage of the project to aide their installation, the Mechanical Contractor will incur all extra electrical costs to revise the electrical feeders/wiring, breakers, fuses, starters and equipment to supply power to the revised piece of equipment.
- 1.9.4. Should the Mechanical Contractor provide alternates to any mechanical equipment selection by deviating from the make and model identified on the Mechanical Schedules and Drawings, the Mechanical Contractor will incur all extra costs to revise the electrical provisions including but not limited to feeders/wiring, breakers, fuses, starters and equipment to supply power to the alternate piece of equipment.
- 1.9.5. Where power for any flush valves, hands-free faucets, or other powered plumbing fixtures are shown on the Drawings, provide either a hard wired direct connection or a duplex receptacle, as required for the valve/faucet/fixture in question, based on coordination with the Mechanical Contractor.
- 1.9.6. Where large smoke dampers or large combination smoke and fire dampers, with multiple actuators per damper, are supplied by the Mechanical Contractor, extend the power connections and fire alarm monitoring and control connections shown on the Drawings to each and every actuator.
- 1.10. FINISHES
- 1.10.1. Metal enclosure surfaces are to be finished by the application of rust resistant primer on both the inside and outside, with at least two coats of enamel.
- 1.10.2. Clean and touch up all surfaces of equipment scratched or marred during shipment or installation. Match the original paint.
- 1.10.3. Clean and prime exposed non-galvanized hangers, racks and fastenings to prevent rusting.
- 1.11. SAFETY
- 1.11.1. Protect exposed live equipment during construction for personnel safety.
- 1.11.2. Shield and mark all live parts "LIVE 120 VOLTS", or with appropriate voltage in English.
- 1.11.3. Arrange for the installation of temporary doors for rooms containing electrical distribution equipment. Keep these doors locked except when under direct supervision of an electrician.
- 1.12. FIRESTOPS
- 1.12.1. Provide firestops in accordance with front end, and Division 1 documents and as described herein. Contractor to coordinate firestops with General Contractor.
- 1.12.2. Firestops and smoke seal systems: in accordance with CAN/ULC-S115 (latest edition).
- .1 Asbestos free materials and systems capable of maintaining an effective barrier against flame, smoke and gases in compliance with requirements of CAN/ULC-S115 (latest edition) and not to exceed opening sizes for which they are intended.
  - .2 Firestop system rating for service penetrations: to suit the latest edition of the National Building Code of Canada with local amendments or the Local/Provincial Building Code, and meet requirements of local authority having jurisdiction.

- .3 Firestop system rating for sealing junction of rated walls to rated floors and ceilings: to suit the National Building Code of Canada with local amendments or the Local/Provincial Building Code, and meet requirements of local authority having jurisdiction.
- 1.12.3. Service penetration assemblies: certified by ULC in accordance with CAN/ULC-S115 (latest edition) and listed in ULC Guide No. 40 U19.
- 1.12.4. Service penetration firestop components: certified by ULC in accordance with CAN/ULC-S115 (latest edition) and listed in ULC Guide No. 40 U19.13 and ULC Guide No. 40 U19.15 under the Label Service of ULC.
- 1.12.5. Fire resistance rating of installed firestop assembly not less than the fire resistance rating of surrounding floor and wall assembly, and in accordance with the National Building Code of Canada with local amendments or the Local/Provincial Building Code and meet requirements of local authority having jurisdiction.
- 1.12.6. Firestops and smoke seals at openings intended for ease of re-entry, such as cables: elastomeric seal; do not use cementitious or rigid seal at such locations.
- 1.12.7. Firestops and smoke seal all electrical penetrations through rated assemblies as per ULC Standards.
- 1.12.8. Where sound and vibration control is required, use an elastomeric seal; do not use a cementitious or rigid seal at such locations.
- 1.12.9. Primers: to manufacturer's recommendation for specific material, substrate, and end use.
- 1.12.10. Water (if applicable): potable, clean and free from injurious amounts of deleterious substances.
- 1.12.11. Damming and backup materials, supports and anchoring devices: to manufacturer's recommendations, and in accordance with tested assembly being installed as acceptable to authorities having jurisdiction.
- 1.12.12. Sealants for vertical joints: non-sagging.
- 1.12.13. Colour: if range available to Engineer's Representative's choice of standard colours, generally to match background colour where visible in finished spaces.
- 1.12.14. Through non-fire or non-smoke separations or where waterproof membrane is field applied, where pipes are insulated, sleeves shall be sized to accommodate the insulation and vapour barrier.
- 1.12.15. Where-holes are core drilled in existing structures, sleeves shall be provided as specified complete with firestops as noted above.
- 1.12.16. Submit a complete firestop system shop drawing package, identifying the products that may be used on the project. Prior to submitting data, review with Authority having Jurisdiction to confirm acceptability of proposed materials and assemblies.
- 1.12.17. Installation
  - .1 Install firestops and smoke seal material and components in accordance with ULC certification and manufacturer's instructions.
  - .2 Seal-holes or voids made by through penetrations, poke through termination devices, and un-penetrated openings or joints to ensure continuity and integrity of fire separation are maintained.
  - .3 Provide temporary forming as required and remove forming only after materials have gained sufficient strength and after initial curing.
  - .4 Tool or trowel exposed surfaces to a neat finish.
  - .5 Remove excess compound promptly as work progresses and upon completion.

1.13. ACOUSTIC TREATMENT

- 1.13.1. Electrical Contractor will be responsible for coordinating the electrical installation with the recommendations of the acoustic consultant and their report where one has been included in the contract documents.
- 1.13.2. Refer to the recommendations of the acoustic report where provided, and provide and install acoustic treatments as necessary. This may include separation of receptacles in stud bays, sealing of junction boxes, application of sound insulating materials etc. Coordinate the installation of these materials with the General Contractor and Drywall/Partition Subtrade.
- 1.13.3. Do not install back to back receptacles/back boxes within the same stud bay wherever possible. Where it is not possible to stagger receptacles, provide acoustic seal around receptacle/back box to provide acoustic isolation/separation of spaces.

1.14. HOISTING

- 1.14.1. Electrical Contractor will be responsible for the hoisting of all the equipment in the contract. Contractor to coordinate with General Contractor for use of the general hoisting facilities. If hoist facilities are inadequate, then subcontractors must provide their own. Subcontractors must inform general contractors in writing of requirements before tender closing date. Any hoisting required in addition to that provided by the General, will be included in the bid price.
- 1.14.2. Electrical Contractor to include for the qualified millwrights to move and place all equipment over 1000 lbs. Contractor to provide proof of millwright certification.

1.15. CLEANING AND WASTE REMOVAL

- 1.15.1. Clean all electrical equipment that has been exposed to construction dust and dirt.
- 1.15.2. Contractor to clean all electrical equipment, inside and out, prior to turn over to Owner. Equipment is subject to review by Engineer's Representative and/or Owner.
- 1.15.3. Contractor is responsible to remove their own waste from the site. All re-usable materials shall be recycled.

1.16. SPRINKLERS

- 1.16.1. All electrical equipment shall be suitable for installation in a sprinklered environment and enclosures are to be CSA Type 1 with drip hood, sprinkler proof enclosure unless otherwise noted.

1.17. TEMPORARY LIGHT AND POWER

- 1.17.1. Temporary light and power for construction shall be provided, metered, and maintained by the electrical trade, as directed by the General Contractor; but each trade shall provide all extension cords, lamps, etc., required to complete their work.
- 1.17.2. All temporary light to be LED. Provide adequate lighting to meet all health and safety standards.

1.18. EXAMINATION AND PROTECTION OF SITE

- 1.18.1. Before submitting Bid, each trade shall examine the site to determine the conditions which may affect the proposed work. No claims for extra payment will be considered because of failure to fulfil this condition.

- 1.18.2. Contractor to document any existing conditions on site and submit a pre-condition survey including pictures. Contractor will be responsible to return the site back to its original form, which includes but is not limited to ground repair including grading and new sod and repair of damaged walls, doors and/or floors.
- 1.18.3. When requested by the Owner and/or Engineer's Representative, the Contractor is to provide digital pictures of the site, including but not limited to progress of work and installed equipment, via e-mail to the Owner and/or Engineer's Representative.
- 1.19. DRAWINGS AND INSTALLATION
- 1.19.1. The drawings are intended to show the general character and scope of the work and not the exact details of the installation. The installation shall be complete with all accessories required for a complete and operative installation.
- 1.19.2. The location, arrangement and connection of equipment and materials shown on the drawings represent a close approximation to the intent and requirements of the contract. The right is reserved by the Engineer's Representative to make reasonable changes required to accommodate conditions arising during the progress of the work, at no extra cost to the Owner.
- 1.19.3. Certain details indicated on the drawings are general in nature and specific labelled detail references to each and every occurrence of use are not indicated, however, such details shall be applicable to every occurrence on the drawings.
- 1.19.4. The actual location of switches, outlets and luminaires, etc. shall be reviewed by the Engineer's Representative before installation.
- 1.19.5. The location and size of existing services shown on the drawings are based on the best available information. The actual location of existing services shall be verified in the field before work is commenced. Particular attention shall be paid to buried services.
- 1.19.6. Changes and modifications necessary to ensure co-ordination and avoid interference and conflicts with other trades or to accommodate existing conditions, shall be made at no extra cost to the Owner.
- 1.19.7. Leave areas clear where space is indicated as reserved for future equipment, and equipment for other trades.
- 1.19.8. Adequate space and provisions shall be left for removal of components and servicing of equipment, with minimum inconvenience to the operation of systems.
- 1.19.9. Where equipment is shown to be 'roughed-in only' obtain accurate information from the Engineer's Representative before proceeding with the work.
- 1.19.10. Contractor is to review Architect's specifications, drawings and details to confirm locations of devices and equipment.
- 1.20. SUPPLEMENTARY BID FORM AND SUBMISSIONS OF BID
- 1.20.1. Submit with tender, if included in the documents, a complete Form. Tenders not completed in full may, at the discretion of the Owner be rejected.
- 1.20.2. Several alternative, separate and itemized prices may have been requested. These shall be completed on the. Refer to the specific sections of the specifications and to the drawings for details.
- 1.21. APPROVED MANUFACTURERS
- 1.21.1. Where only one name appears in the specification, the bid shall include for the specified equipment.

- 1.21.2. Where two or more names are shown in the specifications as alternates or equal to, this division can select which manufacturer is to be carried.
- 1.21.3. The Contractor is to list substitute equipment as a price deduction to the Bid Price on the Electrical Supplementary Bid Form. Space has been provided to show manufacturers not specifically mentioned. Acceptance of substitute equipment shall be at the discretion of the Owner and/or Engineer's Representative. Any substitutes not listed on the Electrical Supplementary Bid Form will not be entertained.
- .1 The proposed substitution shall show product name and complete description and also what difference, if any, will be made in the amount of the Bid Price for each substitution, should it be accepted.
  - .2 Materials and products specified by the name of the manufacturer, the brand or trade name, or catalogue reference, shall be the basis of the Bid Price.
  - .3 Any alternate and/or substitute equipment listed shall be equal in performance and quality to that specified. If space, power, structural or any other requirements are different from the equipment specified, the cost of any changes shall be included for in the price shown on the Electrical Supplementary Bid Form.
  - .4 The Owner reserves the right to accept or reject any substitution without question.
  - .5 The "Base and Alternate Equipment" is for North American manufactured products. Where a listed manufacturer can offer either North American or non-North American source for the equipment, the country of origin shall be shown under "Substitute Equipment" and the cost savings shown under "Deduct from Tender Price".
- 1.22. PRODUCTS AND MATERIALS
- 1.22.1. Make and quality of materials used in the construction of this project shall be subject to the approval of the Engineer's Representative.
- 1.22.2. All equipment and material are to be CSA certified or approved by an accredited organization. Where there is no alternative to supplying equipment which is not CSA certified, obtain special approval from Electrical Inspection Authorities.
- 1.22.3. Factory assemble control panels and component assemblies.
- 1.22.4. Materials and equipment supplied by this division shall be new and free from defects and shall be equivalent in physical characteristics and performance to that specified by the manufacturer's name and catalogue reference.
- 1.22.5. Where a certain manufacturer's equipment has been specified by name or model number, the contractor shall be responsible for ensuring that the performance and quality meets the specified equipment and that the same access or maintenance space is available for an alternative manufacturer's equipment that is used and that interfacing connections with other trades can be made at no extra cost.
- 1.22.6. Within 30 days of the award of contract, the Contractor is to submit a complete list of the manufacturers for all equipment being supplied on the project.
- 1.22.7. Availability
- .1 In submitting Bid, Contractor warrants that all materials are available in suitable time to meet Contract dates.
  - .2 Subject to sentence .3 below, where the Contractor advises that the Contractor cannot supply materials in suitable time to meet Contract dates, and should it subsequently appear that Work may be delayed for such reason, the Engineer's Representative reserves the right to substitute more readily available products of similar character, even if more costly to the Contractor, at no increase in Contract Price.

- .3 Where the Contractor can show that the Contractor promptly ordered the originally specified materials the Owner will pay the differential in cost between the originally specified material and the substitute material without any mark-ups applicable by the Contractor, subcontractors, sub-subcontractors or suppliers. For greater certainty, the Contractor's failure to submit shop drawings or other submittals or seek direction in those instances where the Contract Documents so require in sufficient time to permit ordering materials is not cause for the Owner to pay the cost differential in sentence .2 above.

### 1.23. CO-OPERATION WITH CONSULTANTS

- 1.23.1. To assist in the successful execution of the project, the Contractor shall receive a job report that summarizes the expectations of the Consultant and the Contractor. This document covers topics such as progress billings breakdowns, shop drawing requirements, change order pricing breakdowns, the commissioning process, installation drawings, the specifications, as-built drawings and O+M manuals, along with a number of other items. This job report is intended to reiterate and elaborate on key items of the Contract Documents and is not intended to impose new requirements.
- 1.23.2. At the appropriate time during construction the Contractor shall submit the applicable documentation listed in the "Mechanical/Electrical Unfinished Building Occupancy Checklist". The list shall be issued by the Consultant during the course of the project; however, a sample checklist can be provided at any time upon request. The checklist shall be completed by the Contractor when the information required for occupancy is submitted. The Consultant shall review the information and checklist and shall identify when the information is complete. The Consultant's general review letter (required for building occupancy) shall only be issued when all the information requested in the checklist is submitted by the Contractor and deemed to be complete by the Consultant.
- 1.23.3. For electrical systems occupancy, provide a PDF copy of the following documents to the Engineer's office for review:
  - .1 Electrical inspection authority inspection certificate/report with no deficiencies.
  - .2 Fire alarm verification report with no deficiencies.
    - .1 Ensure that the verification report meets the requirements for verification reports indicated in the Fire Alarm specification section, including the inclusion of audible sound pressure levels and testing with doors closed. Additionally, ensure that the sound pressure levels in the report comply with the minimums, maximums, and minimum levels above ambient stated in Part 3 of the applicable Building Code. Ensure that the report addresses maglocks and music system mute signal, where applicable to the project.
  - .3 CAN/ULC-S1001 "Standard for Integrated Systems Testing of Fire Protection and Life Safety Systems" reports for electrical systems with no deficiencies.
    - .1 Ensure that the report addresses all systems indicated in the "Life Safety Integration Testing" clause within this specification section.
  - .4 Letter confirming that all emergency lighting and exit signs are installed and illuminated and stating that emergency lighting and exit signs are installed in conformance with the Contract Documents.
  - .5 Letter confirming that all unit equipment for emergency lighting (batteries, heads, exit signs) are installed and powered and have been tested to demonstrate that they last for the run time indicated in the Specifications or on the Drawings. State the applicable run time in the letter. Additionally, ensure that letter states that emergency lighting and exit signs are installed in conformance with the Contract Documents.

- .6 Letter with written confirmation that all new, relocated, or reinstalled ceiling luminaires are supported from the building structure, independent from the suspended ceiling, in accordance with the requirements of the Lighting Equipment specification section.
- .7 Letter confirming that all openings in walls and floors for electrical services have been firestops.
- .8 Cyber Security Report Letter and backup schedule as required by Section 26 05 01.00 – GENERAL INSTRUCTIONS FOR ELECTRICAL SECTIONS.
- .9 Lighting control commissioning documentation.
- .10 Additional items as indicated by the Engineer's Representative.
- .11 Additional items as indicated on the Occupancy of Unfinished Buildings Checklist issued by Engineer's Representative.

1.24. CO-OPERATION WITH OTHER DIVISIONS

- 1.24.1. Particular attention must be paid to the proximity of electrical conduit and cable to mechanical piping and equipment.
- 1.24.2. Electrical conduits shall not touch or be supported on pipe or duct walls.
- 1.24.3. Each section shall confine itself to installing all materials in the spaces shown without encroaching upon space for materials installed under other sections or divisions. Where the space allocated to another section or division is encroached upon, the materials shall be relocated to their proper space allocation in such a manner to complete the work using space allocated to the various sections and divisions. Relocation of materials and work involved shall be paid for by the section responsible for the encroachment at no extra cost to the Owner.
- 1.24.4. The supply of all items is to have built-in to the delivery schedule, ample time for rapid progress of work. Proceed with work determined by the construction schedule.
- 1.24.5. The Electrical Contractor shall coordinate the exact breaker/fuse sizes with all mechanical equipment shop drawings prior to rough-in and ordering of the electrical distribution equipment. Size of breakers/fuses shown on drawings are based on generic equipment manufacturers and sizes may change depending on successful equipment manufacturer. No additional costs shall be allowed for non-coordinated mechanical shop drawing reviews by the Electrical Contractor.

1.25. TEMPORARY USE OF EQUIPMENT

- 1.25.1. Where the electrical systems are operated during construction, the Electrical Contractor shall maintain the system and equipment in proper operating condition.
- 1.25.2. Before any area of the building is turned over to the Owner for acceptance and for beginning of the guarantee/warranty period, the systems and equipment shall be returned to the initial new condition.
- 1.25.3. Permanent electrical equipment is only to be used upon permission of Owner and Engineer's Representative and is only to be used on a limited basis. All equipment must be cleaned prior to turnover.

1.26. WARRANTY

- 1.26.1. Except where longer warranty periods are required by other specification sections, provide a one (1) year warranty for the Work, starting at Substantial Performance of the Work.
- 1.26.2. Coordinate the extension of manufacturer warranties to comply with the clause above, based on the duration of construction.

**1.27. STATEMENT OF PRICES**

- 1.27.1. To form a basis for progress payments the successful bidder shall submit a sample progress draw for the various portions of the work. The format of the sample progress draw shall be as shown in the example progress draw below. The sample progress draw shall include a breakdown which illustrates all categories shown on the example progress draw which are relevant to the project. The categories shall be broken down to clearly illustrate the value of the material being supplied as the first subcategory and the value of the labour being supplied as the second subcategory, as shown on the example progress draw. The electrical Engineer's Representative reserves the right to request that additional categories be added to the progress draw if the Engineer's Representative feels that doing so will aid in assessing the contractor's progress on site, thereby expediting contractor payment. Progress draws not including the categories shown on the example progress draw where relevant to the project and / or not providing separate labour value and separate material value subcategories will be rejected.
- 1.27.2. The total price of all portions of the work shall equal the total price of the work covered under the electrical division. Cost for as-built drawings and manuals to be carried as a separate line item.
- 1.27.3. Contractor to list and track all fixed per unit cost luminaires as part of Light Fixtures - Materials on the progress draw.
- 1.27.4. Contractor to list and track each of the approved changes on separate lines on the progress draw.
- 1.27.5. Provide progress draw where the amount claimed is for the value, proportionate to the amount of the Contract, of Work performed and Products delivered to the Place of the Work as of the last day of the payment period. Do not include items on the progress draw which don't meet these conditions.
- 1.27.6. Costs of temporary facilities and utilities shall be amortized over the duration of the Work. Claims for 'mobilization', 'bidding costs', or similar lump sums at or before start of work are not acceptable.

**EXAMPLE PROGRESS DRAW**

**Electrical Contractor Name**  
**Billing Application Electrical Division**  
**Project Name**

<b>Description</b>	<b>Application Number – xx</b>		<b>Date – xxxx to xxxx</b>					<b>Balance to Complete</b>
	<b>Contract Value</b>	<b>%</b>	<b>Billed To Date</b>	<b>%</b>	<b>Prev. Billed</b>	<b>%</b>	<b>This Billing</b>	
Permits / Mobilization	xxx,xxx.xx	xxx	xxx,xxx.xx	xxx	xxx,xxx.xx	xxx	xxx,xxx.xx	xxx,xxx.xx
Demolition & Removals	xxx,xxx.xx	xxx	xxx,xxx.xx	xxx	xxx,xxx.xx	xxx	xxx,xxx.xx	xxx,xxx.xx
Duct Banks – Material	xxx,xxx.xx	xxx	xxx,xxx.xx	xxx	xxx,xxx.xx	xxx	xxx,xxx.xx	xxx,xxx.xx
Duct Banks – Labour	xxx,xxx.xx	xxx	xxx,xxx.xx	xxx	xxx,xxx.xx	xxx	xxx,xxx.xx	xxx,xxx.xx
Feeder Conduit – Material	xxx,xxx.xx	xxx	xxx,xxx.xx	xxx	xxx,xxx.xx	xxx	xxx,xxx.xx	xxx,xxx.xx
Feeder Conduit – Labour	xxx,xxx.xx	xxx	xxx,xxx.xx	xxx	xxx,xxx.xx	xxx	xxx,xxx.xx	xxx,xxx.xx
Feeder Wire – Material	xxx,xxx.xx	xxx	xxx,xxx.xx	xxx	xxx,xxx.xx	xxx	xxx,xxx.xx	xxx,xxx.xx
Feeder Wire – Labour	xxx,xxx.xx	xxx	xxx,xxx.xx	xxx	xxx,xxx.xx	xxx	xxx,xxx.xx	xxx,xxx.xx
Power & Ltg. Branch Conduit – Material	xxx,xxx.xx	xxx	xxx,xxx.xx	xxx	xxx,xxx.xx	xxx	xxx,xxx.xx	xxx,xxx.xx
Power & Ltg. Branch Conduit – Labour	xxx,xxx.xx	xxx	xxx,xxx.xx	xxx	xxx,xxx.xx	xxx	xxx,xxx.xx	xxx,xxx.xx
Power & Lighting Branch Wire – Material	xxx,xxx.xx	xxx	xxx,xxx.xx	xxx	xxx,xxx.xx	xxx	xxx,xxx.xx	xxx,xxx.xx

Power & Lighting Branch Wire – Labour	xxx,xxx.xx	xxx	xxx,xxx.xx	xxx	xxx,xxx.xx	xxx	xxx,xxx.xx	xxx,xxx.xx
Fire Alarm Conduit – Material	xxx,xxx.xx	xxx	xxx,xxx.xx	xxx	xxx,xxx.xx	xxx	xxx,xxx.xx	xxx,xxx.xx
Fire Alarm Conduit – Labour	xxx,xxx.xx	xxx	xxx,xxx.xx	xxx	xxx,xxx.xx	xxx	xxx,xxx.xx	xxx,xxx.xx
Fire Alarm Cable – Material	xxx,xxx.xx	xxx	xxx,xxx.xx	xxx	xxx,xxx.xx	xxx	xxx,xxx.xx	xxx,xxx.xx
Fire Alarm Cable – Labour	xxx,xxx.xx	xxx	xxx,xxx.xx	xxx	xxx,xxx.xx	xxx	xxx,xxx.xx	xxx,xxx.xx
Comms / Security / AV Conduit – Material	xxx,xxx.xx	xxx	xxx,xxx.xx	xxx	xxx,xxx.xx	xxx	xxx,xxx.xx	xxx,xxx.xx
Comms / Security / AV Conduit – Labour	xxx,xxx.xx	xxx	xxx,xxx.xx	xxx	xxx,xxx.xx	xxx	xxx,xxx.xx	xxx,xxx.xx
Comms / Security / AV Cable – Material	xxx,xxx.xx	xxx	xxx,xxx.xx	xxx	xxx,xxx.xx	xxx	xxx,xxx.xx	xxx,xxx.xx
Comms / Security / AV Cable – Labour	xxx,xxx.xx	xxx	xxx,xxx.xx	xxx	xxx,xxx.xx	xxx	xxx,xxx.xx	xxx,xxx.xx
Distribution Equipment – Material	xxx,xxx.xx	xxx	xxx,xxx.xx	xxx	xxx,xxx.xx	xxx	xxx,xxx.xx	xxx,xxx.xx
Distribution Equipment – Labour	xxx,xxx.xx	xxx	xxx,xxx.xx	xxx	xxx,xxx.xx	xxx	xxx,xxx.xx	xxx,xxx.xx
Generator / Inverter – Material	xxx,xxx.xx	xxx	xxx,xxx.xx	xxx	xxx,xxx.xx	xxx	xxx,xxx.xx	xxx,xxx.xx
Generator / Inverter – Labour	xxx,xxx.xx	xxx	xxx,xxx.xx	xxx	xxx,xxx.xx	xxx	xxx,xxx.xx	xxx,xxx.xx
Light Fixtures – Material†	xxx,xxx.xx	xxx	xxx,xxx.xx	xxx	xxx,xxx.xx	xxx	xxx,xxx.xx	xxx,xxx.xx
Light Fixtures – Labour	xxx,xxx.xx	xxx	xxx,xxx.xx	xxx	xxx,xxx.xx	xxx	xxx,xxx.xx	xxx,xxx.xx
Lighting Controls – Material	xxx,xxx.xx	xxx	xxx,xxx.xx	xxx	xxx,xxx.xx	xxx	xxx,xxx.xx	xxx,xxx.xx
Lighting Controls – Labour	xxx,xxx.xx	xxx	xxx,xxx.xx	xxx	xxx,xxx.xx	xxx	xxx,xxx.xx	xxx,xxx.xx
Fire Alarm Equipment – Material	xxx,xxx.xx	xxx	xxx,xxx.xx	xxx	xxx,xxx.xx	xxx	xxx,xxx.xx	xxx,xxx.xx
Fire Alarm Equipment – Labour	xxx,xxx.xx	xxx	xxx,xxx.xx	xxx	xxx,xxx.xx	xxx	xxx,xxx.xx	xxx,xxx.xx
Wiring Devices – Material	xxx,xxx.xx	xxx	xxx,xxx.xx	xxx	xxx,xxx.xx	xxx	xxx,xxx.xx	xxx,xxx.xx
Wiring Devices – Labour	xxx,xxx.xx	xxx	xxx,xxx.xx	xxx	xxx,xxx.xx	xxx	xxx,xxx.xx	xxx,xxx.xx
Hand Dryers – Material	xxx,xxx.xx	xxx	xxx,xxx.xx	xxx	xxx,xxx.xx	xxx	xxx,xxx.xx	xxx,xxx.xx
Hand Dryers – Labour	xxx,xxx.xx	xxx	xxx,xxx.xx	xxx	xxx,xxx.xx	xxx	xxx,xxx.xx	xxx,xxx.xx
Commissioning / Training	xxx,xxx.xx	xxx	xxx,xxx.xx	xxx	xxx,xxx.xx	xxx	xxx,xxx.xx	xxx,xxx.xx
CAN/ULC-S1001 Integrated Systems Testing per Building Code	xxx,xxx.xx	xxx	xxx,xxx.xx	xxx	xxx,xxx.xx	xxx	xxx,xxx.xx	xxx,xxx.xx
Demobilization / Clean-up	xxx,xxx.xx	xxx	xxx,xxx.xx	xxx	xxx,xxx.xx	xxx	xxx,xxx.xx	xxx,xxx.xx
Manuals / As-Built Drawings	xxx,xxx.xx	xxx	xxx,xxx.xx	xxx	xxx,xxx.xx	xxx	xxx,xxx.xx	xxx,xxx.xx
Subtotal	xxx,xxx.xx	xxx	xxx,xxx.xx	xxx	xxx,xxx.xx	xxx	xxx,xxx.xx	xxx,xxx.xx
<b>Additions to Contract</b>								
CO # / PC # / CCN #	xx,xxx.xx	xxx	xx,xxx.xx	xxx	xx,xxx.xx	xxx	xx,xxx.xx	xx,xxx.xx
Cash Allowance #	xx,xxx.xx	xxx	xx,xxx.xx	xxx	xx,xxx.xx	xxx	xx,xxx.xx	xx,xxx.xx
Subtotal	xx,xxx.xx	xxx	xx,xxx.xx	xxx	xx,xxx.xx	xxx	xx,xxx.xx	xx,xxx.xx
Total Contract	xxx,xxx.xx	xxx	xxx,xxx.xx	xxx	xxx,xxx.xx	xxx	xxx,xxx.xx	xxx,xxx.xx
Less Holdback			xxx,xxx.xx		xxx,xxx.xx		xxx,xxx.xx	

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Total		xxx,xxx.xx		xxx,xxx.xx		xxx,xxx.xx	
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† Inclusive of fixed per unit cost luminaires. Refer to luminaire schedule and/or electrical supplementary bid form for luminaire fixed unit costs.

1.28. METRIC CONVERSIONS

1.28.1. Particular care shall be taken with imperial versus S.I. metric conversions. This applies to all services including, but not limited to, equipment, conduit and site services in both new and existing installations.

1.29. INTERRUPTION OF SERVICES

1.29.1. Any interruption of the electrical services to any part of the building shall come at a time agreeable to the Engineer's Representative. Make all necessary arrangements with those concerned and include for any overtime required to ensure that the interruption is held to a minimum.

1.29.2. Testing and operation of major equipment shall be approved by the Engineer's Representative to avoid excessive electrical utility charges. Such testing to be generally carried out after normal working hours or on weekends.

1.29.3. All such overtime work shall be carried out without additional cost to the Owners.

1.29.4. Modifications to existing electrical equipment, which will require shutdown, must be coordinated with the Owner and will only be permitted on weekdays from 10:00 pm to 6:00 am and on weekends from Friday at 7:00 pm to Sunday 6:00 pm. Exact weekends to be co-ordinated with the Owner. Consecutive weekends of shutdowns will not be allowed. Contractor to pay for all utility costs associated with shutdowns. Any work not associated with live equipment can be done during normal working hours. Work considered disruptive to the normal operation of the building will be done after normal business hours. Exact times to be co-ordinated with Owner.

1.29.5. Contractor to provide a minimum of 5 days written notice of a requirement for a shutdown. Contractor to include for separate meetings with the Owner and Engineer's Representative to discuss the shutdown in detail and to coordinate all the work being performed.

1.29.6. The Contractor is responsible for co-ordination and isolating of all existing services at all voltage levels required for the disconnections and connections to existing buildings. This includes shutting down and isolating existing low and medium voltage services. The owner will not perform any isolations for the contractor but will be present during the work. The contractor is to use qualified personnel for these shutdowns ensuring compliance with all applicable safety requirements.

1.29.7. The Contractor is responsible for any damages caused to existing systems when making connections.

1.29.8. The Contractor is to keep shutdowns of existing buildings to a minimum by scheduling the work and providing the required number of personnel to keep the shutdown to a minimum. This Contractor is to include for as many multiple teams of electricians as is feasible to keep the shutdown work to a minimum.

1.30. PRE-TENDERED EQUIPMENT

1.30.1. The Electrical Trade shall assume complete responsibility for the Owner's pre-tendered equipment and its associated equipment as if it had been purchased by the Contractor, including payment.

- 1.30.2. The Electrical Trade shall provide a warranty for all pre-tendered equipment during the warranty period and shall include for all labour, material and shipping charges not covered in the manufacturer's warranty to completely repair or replace any defective pre-tendered equipment at no cost to the Owner during the warranty period.
- 1.30.3. The Electrical Trade shall take complete responsibility for the co-ordination of delivery of the separate items of equipment and their proper placement as required by jobsite conditions.
- 1.30.4. The Electrical Trade shall provide all materials and labour required to incorporate pre-tendered equipment into a working system whether or not shown on the Drawings or specified herein.
- 1.30.5. The following list of equipment is pre-tendered: Insert the list of Owner Pre-tendered equipment or delete this if none are being included in the project
- .1
- 1.31. VALUATION OF CHANGES
- 1.31.1. Further to contract requirements, the method to be used in determining the value of a change to the Work, by either Change Order or Change Directive, shall be:
- .1 Estimate and acceptance in a lump sum, unless the Engineer's Representative otherwise determines that the method shall be unit prices set out in the Contract.
- 1.31.2. Contractor shall provide the Engineer's Representative with a detailed cost analysis of the contemplated change indicating:
- .1 Quantity of each material.  
.2 Unit cost of each material.  
.3 Time involved.  
.4 Sub-trade quotations including a complete analysis of costs.  
.5 Mark-ups, if applicable.  
.6 Value of GST or HST, as applicable.  
.7 Proposed change in Contract Time.
- 1.31.3. The detailed cost breakdown is to list material and labour separately for each item on the proposed change. The breakdown for contemplated change is to follow the format of the Proposed Change Order below.
- 1.31.4. The following shall not be included in the cost of the work but are covered by the hourly labour rate:
- .1 The Contractor's payroll, administrative, head office and site office expenses, including stationary, postage and other office supplies.  
.2 The costs of the Contractor's Project Manager, clerical and administrative personnel, and executive personnel.  
.3 Use of temporary offices, sheds, small/hand tools, storage, and site office consumables, etc., including but not limited to the cost of telephone, light, power, water and heat used therein.  
.4 Transportation and overnight room expenses for out-of-town labour, if local labour is unavailable.  
.5 Insurance premiums, all government payroll burdens, variable labour factors and union or association funds.  
.6 Licenses and permits, except when these are special for a particular item of work.

- .7 Printing charges for Proposed Changes, Change Orders and Drawings for Contractor's and Subcontractors' use in the work. Engineer's Representative will provide a PDF electronic copy of change notice documentation.
  - .8 The cost of preparing As-Built, layout and working drawings and shop drawings. This includes any and all AutoCAD/BIM costs related to interference drawings or other associated drawings that may be required as part of the changes.
  - .9 The cost of clean-up and disposal of waste material.
  - .10 Parking, travel, coffee break/rest periods, warranties, safety training, WHMIS and health and safety committee, and non-productive time.
  - .11 Rentals, additional bonding, project financing.
- 1.31.5. The Contractor shall not be entitled to any additional compensation arising out of changes to the Work other than the amounts determined and agreed to under CCDC 2-2020 GC 6.2.
- 1.31.6. The Contractor shall inform the Surety Company or Companies who have issued any bonds for this Contract, and any Insurers who have insured any part of the work or operations or who have an interest in this Contract, of all changes in the Contract. Pay all costs of any changes in bonds or insurances required to maintain bonds or insurances in conformance with the requirements of the Contract Documents. Provide Owner immediately with any revised bonds or insurances.
- 1.31.7. Special equipment rental rates will be charged at cost. The Contractor shall provide an official quotation of the equipment rental with the Proposed Change quotation as backup, otherwise special equipment rentals will not be accepted by the Owner/Consultant.
- 1.31.8. The maximum percentage fee for mark-ups shall be as stated in the Division 0/1 specifications or the Contract Supplementary Conditions.
- 1.31.9. All changes, change notices, revisions to contract, Supplemental Instructions, change directives or any additional costs or deletes to the stipulated lump sum contract price are subject to review and scrutiny by a qualified third party or individual.
- 1.31.10. The material costs used shall be a discount to nationally available pricing guides (i.e. Trade Service, Allpricer, etc.) to reflect a value with a fair and reasonable markup to the actual cost of the materials purchased from distributors. The Owner and/or Engineer's Representative reserve the right to negotiate material pricing to a value that is fair and reasonable to the Owner.
- 1.31.11. Labour Rate
- .1 During the duration of the electrical contract, extra work hourly labour units are to be based on the latest edition of the National Electrical Contractors Association (NECA) labour units column 1(one). No additional factors will be accepted.
  - .2 The hourly labour rate for all changes will be based on a Journeyman Electrician rate as listed on the Bid Form and/or Electrical Supplementary Bid Form. The Owner and/or Engineer's Representative reserve the right to renegotiate the labour rate. The hourly labour rate will be inclusive of overhead, markup and profit. The labour rate will be inclusive of all labour burden charges as stated in this 'Valuation of Changes' section above.
  - .3 The following labour burdens are not part of the hourly labour cost, but are covered under the NECA labour unit rates: safety measures and regulations; drawing and specification study; layout, measuring and marking the installation location; material unloading, jobsite storage and delivery to the installation area; inspection, uncrating and shipping support removal; tool acquisition and return to storage; clean-up of excess material; and testing circuits for continuity.
  - .4 At the request of the Owner or the Engineer's Representative, the Contractor is to submit a detailed labour cost breakdown showing a breakdown of all adders to the base

wage rate to show how the Contractor has come to the proposed hourly rate. The Owner and the Engineer's Representative reserve the right to negotiate the hourly labour rate with the Contractor.

.1 Provide detailed labour cost breakdown for both foreman and journeyman, including the categories shown below, with each category expanded to show the individual line items within the category:

- .1 Category: Wages
  - .1 Base rate
  - .2 Vacation / Statutory Holiday pay
  - .3 xxx
- .2 Category: Union / Association Funds
  - .1 xxx
- .3 Category: Payroll Burdens
  - .1 EI
  - .2 CPP
  - .3 xxx
- .4 Category: Labour Burdens
  - .1 xxx

- 1.31.12. When pricing additional work for Proposed Changes, the Electrical Contractor shall only price new materials that are required for the Proposed Change. Where existing materials and/or infrastructure (i.e. homerun conduits back to electrical panels) can be re-used for the Proposed Change, the Electrical Contractor shall utilize these items in the valuation of the Change at no extra cost.
- 1.31.13. Where a Proposed Change includes both credits and extras, overhead and permitted mark-ups apply to the net extra or credits, if any, of the entire change.
- 1.31.14. When pricing Proposed Changes containing both additions and credits, and where no work and/or materials have been installed on site, the Electrical Contractor shall only price the net new materials and net new labour that are required for the Proposed Change. Per unit labour and material costs shall be equal for credits and additions.

## PROPOSED CHANGE ORDER

Company Name:	CCN #
Address:	Date:
City, Prov.:	Project Name:
Postal Code:	Project Number:
Telephone:	Page Number:
Fax:	Change Order #:
E-Mail address:	
Client Address:	

### Work Description

We reserve the right to correct this quote for errors and omissions.  
 This quote covers direct costs only.  
 This price is good for acceptance within 30 days from the date of receipt.

### Itemized Breakdown

Item 1.1.1.					
<u>Description</u>	<u>Qty</u>	<u>Net Price U</u>	<u>Total Mat(\$)</u>	<u>Labor U</u>	<u>Total Hours</u>
3/4" EMT		xxx.xx C		5.00 C	
3/4" EMT STL SS CONN		xx.xx C		10.00C	
3/4" EMT STL SS CPLG		xx.xx C		5.00 C	
3/4" EMT STRAP 1-H		xx.xx C		4.00 C	
#10 x 1" SELF TAPPING SCREW		x.xx C		5.50 C	
<b>TOTALS</b>			xxx.xx		xx.xx

Item 1.1.2.					
<u>Description</u>	<u>Qty</u>	<u>Net Price U</u>	<u>Total Mat(\$)</u>	<u>Labor U</u>	<u>Total Hours</u>
3/4" EMT		xxx.xx C		5.00 C	
3/4" EMT STL SS CONN		xx.xx C		10.00C	
3/4" EMT STL SS CPLG		xx.xx C		5.00 C	
3/4" EMT STRAP 1-H		xx.xx C		4.00 C	
#10 x 1" SELF TAPPING SCREW		x.xx C		5.50 C	
<b>TOTALS</b>			xxx.xx		xx.xx

### Description

#### Material

General Materials			
Permitted Mark-up	(@ xx.xx %)		
<b>Material Total</b>			

#### Labour

Journeyman	(xx Hrs. @ \$xx.00)		
Foreman @ 10%	(xx Hrs. @ \$xx.00)		
<b>Labour Total</b>			

#### Material and Labour Total

**Final Amount**

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1.32. DEMOLITION

- 1.32.1. The demolition drawings show the general scope of the demolition and not exact details or total extent. For exact details and total extent each service must be carefully checked on site. Before removing services follow the service through to ensure other areas of the building are not affected.
- 1.32.2. Whenever existing services or equipment are to be removed, all electrical connections for such services shall be removed and securely terminated in an approved manner. If necessary to facilitate installation of new work, any existing services and equipment shall be removed and then replaced by this division.
- 1.32.3. Whenever it becomes necessary to relocate any electrical services equipment to make possible installation of the work under this contract, such relocation shall be done by this division without additional cost to the Owner.
- 1.32.4. Make safe and disconnect all power and systems, as and when, and to the extent required to facilitate the demolition.
- 1.32.5. If applicable, review the mechanical, architectural, and other related discipline drawings, and include for removing and making safe all power connections to demolished equipment and devices, back to the source panel, except where indicated otherwise on the drawings.
- 1.32.6. Ensure that all electrical, life safety services, and services for existing equipment, in areas outside the areas of this work, that are required to remain in service, shall do so.
- 1.32.7. Relocate any electrical feeders or equipment that are required to remain in service, that are secured to existing walls, floors or ceilings to be demolished or that are buried and required to be excavated for new work.
- 1.32.8. Remove and replace any electrical equipment on walls or ceilings that will be demolished and rebuilt.
- 1.32.9. Disconnect and remove existing light fixtures, devices, outlets, CCTV, security devices, etc. which are not to be reused. Such items shall be packaged and turned over to the Owner at a place designated by the Owner. Cut back and cap unused raceway and outlets and remove unused wiring back to panelboard in an approved manner.
- 1.32.10. Ensure that all existing equipment which is to be reused and/or relocated is thoroughly reviewed and refurbished to ensure correct operation when put back into service and to meet the requirements of the local authorities having jurisdiction. All existing electrical equipment which is no longer required shall be removed and disposed of off-site.
- 1.32.11. Carry out the work with a minimum of noise, dust and disturbance.
- 1.32.12. Provide tools and clean up equipment. Obtain the Owner's permission for the use of electrical, plumbing or drainage outlets.
- 1.32.13. Where a device is shown to be relocated on the drawings, contractor to remove and re-install device and back box and re-feed the device with new conduit and wire from the nearest existing accessible junction box.
- 1.32.14. Electrical Contractor is responsible for the patching and re-painting the entire wall where a device and/or box has been added, removed or relocated.

1.33. CYBER SECURITY

- 1.33.1. Coordinate with Owner's Information Technology representatives, obtain a copy of Owner's cyber security policy and provide all applicable cyber security configurations.
- 1.33.2. Definitions
  - .1 Cyber Assets: Systems (including hardware, software, and data) and communication networks (including hardware, software, and data).

- .2 Critical Cyber Assets: Cyber assets that perform critical system functions. The loss or compromise of these cyber assets would adversely affect the operational reliability of the system.
  - .3 Cyber Attack: The use of electronic means to interrupt, manipulate, destroy, or gain unauthorized access to a computer system, network, or device.
  - .4 Cybercrime: Any crime where cyber – the internet and information technologies, such as software, firmware, computers, tablets, personal digital assistants or mobile devices – has a substantial role in the commission of a criminal offence.
  - .5 Cyber Hygiene: Practices and steps that users of computers and other devices take to maintain system health and improve online security. These practices are often part of a routine to ensure the safety of identity and other details that could be stolen or corrupted.
  - .6 Cyber Incident: Any unauthorized attempt, whether successful or not, to gain access to, modify, destroy, delete, or render unavailable any computer network or system resource.
  - .7 Cyber Security: Technologies, processes, and practices designed to protect networks, devices, programs, and data from attack, damage, or unauthorized access.
  - .8 Cyber Threat or Cyber Security Threat: Malicious act that seeks to damage data, steal data, or disrupt digital life in general. Cyber threats include computer viruses, data breaches, Denial of Service (DDoS / DoS) attacks and other attack vectors.
  - .9 Cyber Threat Actors: Broad term for any states, groups, or individuals who, with malicious intent, aim to take advantage of vulnerabilities, low cyber Security awareness, and technological developments to gain unauthorized access to information systems in order to access or otherwise affect victims' data, devices, systems and networks.
  - .10 IP Multicast: Technique for one-to-many and many-to-many real-time communication over an IP Infrastructure network.
  - .11 Endpoint: Remote computing device that communicates back and forth with a network to which it is connected. Such as a server, desktop, or laptop.
  - .12 Network Certificates: Also known as a Digital Certificates, which are an electronic "password" that allows a person or organization to exchange data securely over the internet using the public key infrastructure (PKI). Digital Certificates are also known as a public key certificate or identity certificate. There are 3 Main types of certificates:
    - .1 Secure Socket Layer Certificate (SSL) Digi-SSL
    - .2 Software Signing (Code Signing Certificate) Digi-Code
    - .3 Client Certificate (Digital ID) Digi-ID
  - .13 Social Engineering: Exploitation methods that target human vulnerabilities, such as carelessness and trust.
  - .14 Technical Vulnerabilities: Weaknesses or flaws in the design, implementation, operation, or management of an information technology system, device, or service.
- 1.33.3. Cyber Security Measures
- .1 Implement at minimum the following multi-layered Cyber Security measures to limit and / or reduce the Owner's potential risk from a cyber threat event; such as a Cyber Security data breach or Cyber Security attack.
  - .2 Password Management
    - .1 Employ password management best practices such as:
      - .1 Do not use default passwords.

- .2 Use strong and unique passwords for all applications. Use a minimum of 8 characters where there is no password policy inherent in the software; use a mixture of uppercase and lowercase letters, numbers, and include at least one special character (! @ # ? ]).
  - .3 Reset passwords at regular intervals.
  - .4 Configure two-factor authentication for all accounts where possible in the system software.
  - .5 Do not use System Admin logins for simple tasks; create separate User accounts with rights levels appropriate for the job function. Create and define user accounts as appropriate such as Role based, Individual logins or assigned roles.
  - .6 Use different passwords for every account.
  - .7 Enforce secure password policies within the business environment.
  - .8 Have interface lock after a predefined # of failed login attempts for a pre determined time interval.
- .3 Port and Interface Management
    - .1 Employ Port Management techniques such as:
      - .1 Restrict access on network switch ports to assigned devices addresses.
      - .2 Lock down all open, unused and unsecure ports on the networking devices such as switches, routers, and firewalls.
      - .3 Shut off all unused communication services and hardware interfaces.
      - .4 Advise Owner on use of 3<sup>rd</sup> party port security monitoring.
  - .4 Physical and Virtual Networks
    - .1 Provide a dedicated VLAN for network connected systems where a dedicated LAN has not been provided.
  - .5 Encryption
    - .1 Use minimum TLS 1.2 for all network attached equipment and use TLS 1.3 where available.
  - .6 Network Certificates
    - .1 Ensure Network Certificates are up to date and not expired for all equipment and systems.
  - .7 Firmware & Software Update Management
    - .1 Use the latest stable Firmware / Software version on all devices / equipment as well as implement a Firmware / Software Update management process and procedure.
  - .8 Manufacturer's System Hardening Guides
    - .1 Provide the Manufacturer's System hardening guides for the equipment being installed and implement as many recommendations / features as possible.
  - .9 External Memory
    - .1 Restrict the use of external memory. Restrict or eliminate the use of devices such as external USB Thumb drives unless expressly allowed by the Owner's Information Technology representatives.
  - .10 Log Off
    - .1 Enable auto-log off timer for all software, websites and logins. Set auto-log off timer on local Workstation(s) being used to access the equipment with a

reasonable timer in the case that an employee leaves the workstation unattended.

- .11 Anti-Virus Software
  - .1 Enable and configure anti-virus software on PC endpoints in accordance with the Owner's Information Technology requirements, unless it is to be installed and configured by the Owner.
- .12 Filtering Techniques
  - .1 Apply filtering techniques including the types listed below where possible:
    - .1 Web Filtering: A Web filter adds another layer to anti-phishing defences by blocking the web based component of phishing and malware attacks.
    - .2 Multicast Message Filtering: Filters the packets sent to multicast groups users are not subscribed to.
    - .3 Content Filtering: Is the use of a program to screen and / or exclude access to web pages or email deemed objectionable. A content filter will then block access to this content.
- .13 Back up Regularly
  - 1. Provide backup schedule in the closeout submittals and configure system for automatic backups wherever possible.
  - 2. Identify files that require manual backup and the backup procedure. This helps to protect against many types of data loss, especially if a Cyber Threat Actor gains access.

#### 1.33.4. IT Devices and Systems

- .1 Apply the Cyber security measures listed in the clauses above in part or in full, as possible, to a wide range of Information Technology (IT) Devices including:
  - .1 Firewalls
  - .2 Routers
  - .3 Network switches (Core and Edge Devices)
  - .4 Servers and databases
  - .5 Workstation computers
  - .6 Network connected system devices and controllers
  - .7 Wireless Access Points and wireless controllers
  - .8 Mobile phones and tablets
  - .9 Any IT System or endpoint connected to the network

#### 1.33.5. Operational Technology (OT) Devices and Systems

- .1 Apply the Cyber security measures listed in the clauses above, in part or in full, as possible, to a wide range of OT Network devices including:
  - .1 Industrial Control Systems such as:
    - .1 (PLC's) Programmable Logic Controllers are an industrial digital computer which has been ruggedized and adapted for the control of manufacturing processes, such as assembly lines, or robotic devices.
    - .2 (SCADA) Supervisory Control and Data Acquisition is a control system architecture comprising of computers, networked data communications and graphical user interfaces (GUI) for high level process supervisory management.

- .3 (DCS) Distributed Control System is a computerized control system for a process or plant usually with many control loops, in which autonomous controllers are distributed throughout the system.
  - .4 (CNC) Computer numerical Control is the automated control of machining tools (Drills, boring tools, lathes) and 3D printers by means of a computer.
  - .2 Building Management Systems (BMS) and Building Automation Systems (BAS)
  - .3 HVAC equipment
  - .4 Lighting controls for both internal and external applications
  - .5 Energy monitoring and metering equipment
  - .6 Transportation and parking systems
  - .7 Scientific equipment
  - .8 Any other OT System or endpoint that can be connected to the network
- 1.33.6. Report Cybercrime
- .1 Advise the Owner and / or their representatives of any indication of a Cyber Incident of a criminal nature when performing any work on a network connected system.
- 1.33.7. Cyber Security Report Letter
- .1 Provide a Cyber Security Report Letter in the closeout documents to the client stating which Cyber Security measures have been implemented, when implementing any and / or all of the Cyber Security Measures mentioned in this Specification.
2. Products
- 2.1. NOT USED
3. Execution
- 3.1. NOT USED
- END OF SECTION

26 05 03.00 As-Built Drawings

1. General

1.1. WORK INCLUDED

1.1.1. Conform to Section 26 05 01.00 – GENERAL INSTRUCTIONS FOR ELECTRICAL SECTIONS.

1.2. RELATED WORK SPECIFIED ELSEWHERE

1.2.1. Refer to As-built Drawings in Section 01 70 00 (01 72 29.00) – CLOSEOUT SUBMITTALS.

1.3. RECORD OF REVISIONS ON SITE

1.3.1. Print and maintain two complete sets of white prints to mark the project progress, changes and deviations.

1.3.2. Maintain an updated copy of plans and schematics in the digital format for which the project is provided (i.e. AutoCAD or Autodesk Revit MEP) and be capable to produce documents in Adobe PDF upon request.

2. Products

2.1. AS-BUILT DRAWINGS

2.1.1. Request in writing from the Engineer's Representative all electrical AutoCAD drawings. Complete release form provided by Engineer's Representative and pay the Engineer's Representative directly the costs identified in this section below prior to receiving the drawings. After the final as-built drawings have been reviewed, send the Engineer's Representative a copy via electronic transfer for their records and send a minimum of one copy on USB key with each set of maintenance manuals. Provide additional copies if required under the General Conditions. Use the same version of AutoCAD software that the drawings were created in and provide electronic files saved in a version acceptable to the end user and engineer.

2.1.2. The contractor is to identify the cost of As-Built Drawings and the Operation and Maintenance Manuals as a separate line item on their progress draw. The following values are to be broken out:

\$5,000	For Electrical Contracts up to \$250,000
2% of Electrical Contract	For Electrical Contracts from \$250,000 to \$1,500,000
\$30,000	For Electrical Contracts over \$1,500,000

2.1.3. The project will remain incomplete and no money will be released until the final versions, both hard and electronic, of the drawings and manuals are received.

2.1.4. Final as-built prints/plots shall not contain markings or corrections by hand (i.e. marker, pen, pencil, etc.). References to the Architect and Engineer must be deleted from the drawings.

2.1.5. Final as-built drawings to include all revisions made to the drawings during construction, including all approved changes. The as-built drawings are to also include the routing of all feeders except for branch circuits, all junction boxes to be shown, drawing legend to be updated to include all symbols and lines used to show as-built conditions, quantity of wires in each conduit, and circuit numbers of wires in each conduit. Include slab layout drawings in as-built drawing package.

2.1.6. CADD Requirements.

- .1 A complete list of layer names and brief description of each layer's use shall accompany all files.
- .2 Fonts for text shall be Autodesk standard. Custom fonts, shape files, etc., are not to be used.
- .3 Final as-built drawings shall be returned on USB stick.
- .4 Each USB stick shall include a file containing Engineer's Representative and Owner, Contract number, file names and Drawing number. Provide a "readme.txt" file in ASCII format. A printed copy of the readme file shall accompany each USB stick.
- .5 All drawings shall be in the same units as issued on Bid Documents.
- .6 Provide a complete list of symbol (block) names with a description of each symbol.
- .7 Special effort shall be made to ensure that drafting is accurate: i.e. appropriate lines are indeed horizontal and vertical; lines that should intersect do but not over-intersect and ensure that entities are placed on correct layers.

2.1.7. Maintain records on site, as the job progresses, and record all changes and deviations from that shown on Contract Drawings. After review and approval of service lines in trenches, take "as-built" measurements, including all depths, prior to commencement of backfilling operations. Show the location of buried electrical ducts and conductors on the drawings and dimensioned from fixed points. Keep drawings up-to-date during construction and in addition to field measurements include Change Orders, Supplemental Instructions and all other changes.

2.1.8. On completion of the building, forward to the Engineer's Representative the digital drawings indicating all such changes and deviations for review by the Engineer's Representative.

2.1.9. If required, the Engineer's Representative will provide a quotation to this Contractor to transfer "As-Built" information from the mark-up documentation to the acceptable software.

- .1 Include a cost of \$400.00 per sheet for the transfer of marked up "As Built" information to AutoCAD and forwarding of the electrical information by the Engineer's Representative to the Owner.

2.1.10. The Electrical Contractor may request from the Engineer's Representative the most current electronic documentation (Electrical Drawings) in AutoCAD sent via electronic transfer. The Engineer's Representative will provide the Drawings one time at no charge. Where the Drawings are requested more than one time throughout the course of the project, a nominal charge of \$500.00 will apply to the second and subsequent requests.

2.1.11. The AutoCAD as-built documents shall meet all the Owner's and Engineer's Representative's requirements.

3. Execution

3.1. NOT USED

END OF SECTION

26 05 04.00 Submittals/Shop Drawings

- 1. General
  - 1.1. WORK INCLUDED
    - 1.1.1. Section 26 05 01.00 – GENERAL INSTRUCTIONS FOR ELECTRICAL SECTIONS.
  - 1.2. RELATED WORK
    - 1.2.1. Comply with Div. 00 for submittal requirements and as amended below.
- 2. Products
  - 2.1. SHOP DRAWINGS
    - 2.1.1. Shop Drawings shall be organized by Specification Section. Ensure shop drawing package for a given Specification Section is complete, including all equipment, products, materials, and systems to be used as part of that Specification Section, and submit as a single shop drawing package. Do not submit numerous separate shop drawings for the same Specification Section. Do not combine more than one section into one submission. Incorrect submissions will be returned without review.
    - 2.1.2. Within three (3) weeks of Project award, submit the following as the first Shop Drawing/Submittal:
      - .1 A list of the Shop Drawings/Submittals that are proposed to be submitted for the Project, taking into account the organizational requirements of the clause above. Order the list based on Specification Section number, from lowest to highest. Follow the format shown in the example below and use the headings shown to produce a table.
      - .2 State expected equipment lead times.
      - .3 State estimated submission date for Shop Drawings/Submittals.

Example Proposed Shop Drawing List

Electrical Contractor Name

Project Name

<u>Specification Section #</u>	<u>Specification Section Name</u>	<u>Item</u>	<u>Expected Equipment Lead Time</u>	<u>Estimated Submission Date</u>
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- 2.1.3. Do NOT submit all Shop Drawings/Submittals for the Project at the same time. If large quantities of Shop Drawing/Submittals are received at the same time, the Consultant will not be able to review them all within the normal time frame and will require the Contractor to identify the priority order in which submissions should be reviewed.
- 2.1.4. Submittals/Shop Drawings shall indicate clearly the materials and/or equipment actually being supplied, all details of construction, accurate dimensions, capacity, operating characteristics and performance. Each Shop Drawing shall give the identifying number of the specific assembly for which it was prepared (e.g. SWBD-1A).

- 2.1.5. Submit shop drawings electronically, by email, in PDF format. Submissions that are not electronic without prior approval from the Engineer's Representative shall be returned as not reviewed. Provide the following information in the email submission:
- .1 S+A project number and Contractor Shop Drawing Identifier in Subject Line
  - .2 Attachments shall be limited to 10 MB
  - .3 Provide FTP hyperlink for all attachments in excess of 10 MB with appropriate information for downloading the file (as required)
  - .4 Shop Drawing Submission to the following email address:
    - .1 ContractAdmin.London@smithandandersen.com
- 2.1.6. Shop drawings submitted directly to Smith + Andersen personnel (and not copied to the email address provided above) without advanced permission will not be processed nor considered as received.
- 2.1.7. Each Shop Drawing for non-catalogue items shall be prepared specifically for this project. Shop Drawings and brochures for catalogue items shall be marked clearly to show the items being supplied.
- 2.1.8. When requested, Shop Drawings shall be supplemented by data explaining the theory of operation – for example: lighting control sequence of operation – the Engineer's Representative may also request that this information be added to the maintenance and operating manual.
- 2.1.9. Provide a cover sheet with the project name, issue date, issue number, specification section number, and title of section with space for Shop Drawing review stamps for the Contractor and Engineer's Representative.
- 2.2. ENVIRONMENTAL PRODUCT DECLARATIONS (EPD)
- 2.2.1. Where EPDs are available for Products, submit them for review.
- 2.2.2. Follow Product Category Rules (PCRs) for Life Cycle Assessment (LCA) presented on EPDs.
- 2.2.3. Where multiple EPDs are available for the same Product, the order of preference is as follows:
- .1 Product Specific, Facility Specific EPD: a Product and manufacturer specific EPD, where the environmental impacts are unique to the specific manufacturing facility.
  - .2 Product Specific EPD: a Product and manufacturer specific EPD where the environmental impacts are considered across multiple manufacturing facilities (i.e. an average of the different facilities in which the Product is manufactured).
  - .3 Industry Average EPD: an EPD for a type of Product, representing the typical environmental impacts averaged across a number of different manufacturers.
3. Execution
- 3.1. SUBMISSION
- 3.1.1. Each Shop Drawing or catalogue sheet shall be in original PDF format stamped and signed by the Contractor to indicate that they have checked the drawing for conformance with all requirements of the Drawings and Specifications, that they have co-ordinated this equipment with other equipment to which it is attached and/or connected and that they have verified all dimensions to ensure the proper installation of equipment within the available space and without interference with the Work of other trades. Ensure that electrical and mechanical co-ordination is complete before submitting drawings for review.
- 3.1.2. Scanned PDF versions are not acceptable.

- 3.1.3. Equipment shall not be released for manufacture until the shop drawing has been reviewed by Engineer's Representative. Contractor shall assume responsibility and cost for field changes. Installation of any equipment shall not start until after final review of Shop Drawings by the Engineer's Representative has been obtained.
- 3.1.4. Should equipment or materials that arrive on site differ from those shown on the Shop Drawings, bear all costs for:
- .1 Revising the equipment and materials.
  - .2 Revising the Work of other contractors impacted.
- 3.1.5. As part of the electrical Engineer's Representative's scope of the work, shop drawings shall be reviewed no more than twice. Should three or more reviews be required due to reasons of Contractor omissions causing resubmission requests, the Contractor shall reimburse the electrical Engineer's Representative for time expended in these extra reviews.

END OF SECTION

26 05 05.00 Mounting Heights

1. General

1.1. WORK INCLUDED

1.1.1. Section 26 05 01.00 – GENERAL INSTRUCTIONS FOR ELECTRICAL SECTIONS.

2. Products

2.1. NOT USED

3. Execution

3.1. MOUNTING HEIGHTS

3.1.1. Mounting height of equipment is from finished floor to centreline of equipment unless specified or indicated otherwise.

3.1.2. If mounting height of equipment is not specified or indicated, verify with the Consultant before proceeding with installation.

3.1.3. Unless indicated otherwise on the drawings or within the specifications, install electrical equipment at following heights.

.1 Local switches: 1050 mm.

.2 Wall receptacles:

.1 General: 450 mm.

.2 Above top of continuous baseboard heater: 200 mm.

.3 Above top of counters or counter splash backs: 175 mm.

.1 Where these receptacles are located adjacent to and in close proximity to local switches, mount receptacles at the same elevation as the local switches to provide a neat, aligned, installation.

.4 In mechanical rooms: 1200 mm.

.5 In equipment storage rooms: 900 mm.

.3 Receptacles for maintenance of equipment located on rooftops:

.1 Not less than 750 mm above the finished roof, per Electrical Code.

.4 Panelboards: 2000 mm to top of panel.

.5 Telephone and interphone outlets: 450 mm.

.6 Wall mounted telephone and interphone outlets: 1050 mm.

.7 Fire alarm stations: 1200 mm, measured to the top of the manual pull station.

.8 Wall Mounted Fire alarm audible devices: 2300 mm and not less than 150 mm from the ceiling, measured to the top of the device.

.9 Television outlets not mounted behind a wall mounted television: 450 mm.

.10 Wall mounted speakers: 2100 mm.

.11 Clocks: 2100 mm.

- .12 Power Door Operator push buttons: 1050 mm.
  
- .13 Wall mounted Exit Signs
  - .1 For 2400 mm to 2500 mm ceiling heights: 2100 mm.
  - .2 For all ceilings heights greater than 2500 mm: 2400 mm.
- .14 Wall mounted Battery Packs and Emergency Heads
  - .1 For 2400 mm to 2500 mm ceiling heights: 2100 mm.
  - .2 For all ceilings heights greater than 2500 mm: 2400 mm.
- .15 Wall mounted occupancy sensors: 1050 mm.
- .16 Wall mounted visible signal devices: 2100 mm to centre of lens; or as allowed by CAN/ULC-S524 "Standard for Installation of Fire Alarm Systems" except where facility accessibility standards require otherwise.
- .17 Top of remote annunciator and passive graphic panels shall be no more than 1800 mm above finished floor.
- .18 Wall mounted emergency telephone (Fireman's Handset): 1350 to 1500 mm.

END OF SECTION

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26 05 21.00 Wires and Cables Under 2000 V

1. General

1.1. WORK INCLUDED

- 1.1.1. Section 26 05 01.00 – GENERAL INSTRUCTIONS FOR ELECTRICAL SECTIONS.
- 1.1.2. Section 26 05 04.00 – SUBMITTALS/SHOP DRAWINGS.
- 1.1.3. Section 26 08 01.00 – TECHNICAL SERVICES DIVISION STARTUP SERVICE.

1.2. REFERENCES

- 1.2.1. CSA C22.2 No. 0.3, Test Methods for Electrical Wires and Cables, latest edition.
- 1.2.2. CSA C22.2 No. 38, Thermoset-Insulated Wires and Cables, latest edition.
- 1.2.3. CSA C22.2 No. 51, Armoured Cables, latest edition.
- 1.2.4. CSA C22.2 No. 75, Thermoplastic-Insulated Wires and Cables, latest edition.
- 1.2.5. CSA C22.2 No. 96, Portable Power Cables, latest edition.
- 1.2.6. CSA C22.2 No. 123, Metal Sheathed Cables, latest edition.
- 1.2.7. CSA C22.2 No. 124, Mineral-Insulated Cable, latest edition.
- 1.2.8. CSA C22.2 No. 131, Type TECK 90 Cable, latest edition.
- 1.2.9. CSA C22.2 No. 174, Cables and Cable Glands for Use in Hazardous Locations, latest edition.
- 1.2.10. CAN/ULC S139 / UL 2196 (Binational Standard), Standard for Fire Test for Circuit Integrity of Fire-Resistive Power, Instrumentation, Control, and Data Cables, latest edition.
- 1.2.11. ASTM B800 - Standard Specification for 8000 Series Aluminium Alloy Wire for Electrical Purposes-Annealed and Intermediate Tempers, latest edition.

1.3. SHOP DRAWINGS AND PRODUCT DATA

- 1.3.1. Submit Shop Drawings and product data in accordance with Section 26 05 04.00 – SUBMITTALS/SHOP DRAWINGS.
- 1.3.2. Submit voltage drop calculations as a submittal for the Consultant's review where required by this specification section.

1.4. WARRANTY

- 1.4.1. Provide a warranty in accordance with the requirements of Section 26 05 01.00 – GENERAL INSTRUCTIONS FOR ELECTRICAL SECTIONS.

2. Products

2.1. BUILDING WIRES

- 2.1.1. Conductors: stranded for 10 AWG and larger. Minimum size: 12 AWG.
- 2.1.2. Contractor to provide copper conductors on conductors sizes up to and including #6 AWG. Contractor to provide copper conductors for sizes larger than #6 AWG unless identified as aluminium or NUAL on the drawings.

- 2.1.3. All conductors to have size as indicated, with insulation of chemically cross-linked thermosetting polyethylene material rated RW90 or RWU90 to CSA C22.2 No. 38 rated as follows:
  - .1 Insulation rated at 1000 V for 600 V systems that are ungrounded or have a neutral grounding resistor to limit ground fault current.
  - .2 Insulation rated at 600 V for the other 600 V and 347/600 V distribution systems not covered under item #1 above.
  - .3 Insulation rated at 600 V for all systems rated at 480 V and less.
- 2.1.4. All aluminium or NUAL conductors to be an aluminium alloy with CSA certified as an Aluminium conductor material (ACM) and meet the requirements of the Aluminium Association Inc. AA8030 and ASTM B800 standards. Provide an anti-oxidant compound, Ideal NOALOX, on all aluminum conductor terminations.
- 2.1.5. RWU90 wiring is to be used for underground installations.
- 2.2. TECK CABLE
  - 2.2.1. Cables to CSA C22.2 No.131.
  - 2.2.2. Conductors:
    - .1 Bonding conductor: copper.
    - .2 Circuit conductors: copper, size as indicated unless aluminium or NUAL is identified on the drawings. Aluminium or NUAL conductor to be provided as per item 2.1.4.
  - 2.2.3. Insulation:
    - .1 Chemically cross-linked thermosetting polyethylene type RW90, rated 1000 V.
  - 2.2.4. Inner jacket: polyvinyl chloride material.
  - 2.2.5. Armour: interlocking aluminum.
  - 2.2.6. Overall covering: thermoplastic polyvinyl chloride material rated at a minimum of FT-4.
- 2.3. MINERAL-INSULATED CABLES
  - 2.3.1. Conductors: solid bare soft-annealed copper, size as indicated.
  - 2.3.2. Insulation: compressed powdered magnesium oxide to form compact homogeneous mass throughout entire length of cable.
  - 2.3.3. Overall covering: annealed seamless copper sheath, Type M1 rated 600 V, 250 C.
  - 2.3.4. Outer jacket: PVC applied over sheath, where installed in damp and wet locations.
  - 2.3.5. Two (2) hour fire rating.
  - 2.3.6. Conform to requirements of CSA C22.2 No. 124; and CAN/ULC S139.
  - 2.3.7. All mineral-insulated cable larger than #6 AWG shall be single conductor. For conductors #6 AWG and smaller, multi-conductor mineral-insulated cable is acceptable.
  - 2.3.8. Manufacturer / Product: nVent Pyrotenax System 1850.
- 2.4. ARMoured CABLES
  - 2.4.1. Cables to: CSA C22.2 No. 51.
  - 2.4.2. Circuit conductors: copper, size as indicated unless aluminium or NUAL is identified on the drawings. Aluminium or NUAL conductor to be provided as per item 2.1.4.
  - 2.4.3. Type: AC90 (BX).

- 2.4.4. Armour: interlocking type fabricated from aluminium strip.
- 2.4.5. Type: ACWU90 - PVC flame retardant jacket over armour meeting requirements of Vertical Tray Fire Test of CSA C22.2 No. 0.3 with maximum flame travel of 1.2 m.
  
- 2.5. WIRING TERMINATION
  - 2.5.1. Lugs, terminals, screws used for termination of wiring to be to be dual rated for Copper/Aluminum (Cu/Al).
  - 2.5.2. Lugs, terminals, and screws used for termination of multiple wires must be rated for their intended use.
  
- 3. Execution
  - 3.1. GENERAL
    - 3.1.1. Provide a minimum of one bonding conductor for each three ungrounded conductors on all cable runs that do not include conduit. Provide a minimum of one bonding conductor within each power conduit.
    - 3.1.2. For all bonding conductors, provide copper conductors insulated with a green coloured insulation.
    - 3.1.3. Provide a separate dedicated insulated bonding conductor for isolated ground receptacles. See detail on Drawings for more information.
    - 3.1.4. Provide a dedicated neutral for GFCI and AFCI breaker circuits. Install in accordance with breaker manufacturer's written instructions.
    - 3.1.5. Size bonding conductor to applicable tables of the:
      - .1 Ontario Electrical Safety Code.
    - 3.1.6. All equipment, junction boxes, pull boxes, liquid tight flex, etc. to be bonded to ground through bonding conductors.
    - 3.1.7.
    - 3.1.8. Ensure slack is provided in wiring connections to equipment which contains moving parts.
    - 3.1.9. Provide a variable frequency drive (VFD) cable from each VFD unit to each motor. Wiring to be installed in accordance with the VFD and motor manufacturer instructions.
    - 3.1.10. Utilize compression type fittings for the following terminations: incoming conductors into main lug only panelboards rated over 600 A; and terminations onto bus work in switchboards, switchgear, transformers, transfer switches, generators, UPSs, and other electrical equipment.
      - .1 For all compression type fittings, provide two-hole long barrel type lugs complete with lug inspection / viewing windows that allow installer to see how far the conductor has been inserted into the lug. Where mechanical screw type lugs are allowed, ensure that they are suitable for the quantity of parallel runs of wire that are to be terminated under. Provide lugs that are dual rated for copper (Cu) and aluminum (Al).
    - 3.1.11. Armoured Cable Type AC90 (BX) may only be used for individual drops from slab mounted junction box to recessed mounted light fixtures or where noted on the drawings where wiring is required to be installed within an existing wall. The maximum allowable distance of armoured cable is 3 m. Contractor to receive written approval from the Engineer's Representative to run armoured cable further than 3 m from junction box. Daisy chaining of fixtures is only acceptable in dry wall ceilings. Wiring in conduit is to be brought to a junction box to allow for the transition to armoured cable. Armoured cable is not to be installed directly into electrical panels or run in walls for receptacles.

- 3.1.12. For 120 V, 15 A or 20 A circuits, copper branch circuit wiring to be upsized as follows to address voltage drop when:
- .1 The entire length of the circuit wiring exceeds 17 m – branch wiring to be a minimum of No. 10 AWG.
  - .2 The entire length of the circuit wiring exceeds 27 m – branch wiring to be a minimum of No. 8 AWG.
  - .3 The entire length of the circuit wiring exceeds 44 m – branch wiring to be a minimum of No. 6 AWG.
  - .4 Where the entire length of the circuit wiring exceeds 70 m, perform voltage drop calculations using Electrical Code Table D3, demonstrate compliance with the Electrical Code, submit calculations to Consultant as a submittal, and include for larger conductors and conduits as required by the calculations.
- 3.1.13. For 120 V branch circuits rated more than 20 A, perform voltage drop calculations using Electrical Code Table D3, demonstrate compliance with the Electrical Code, submit calculations to Consultant as a submittal, and include for larger conductors and conduits as required by the calculations.
- 3.1.14. For branch circuits shown only on a panel schedule (i.e. not shown on a single line diagram) and of the following voltages: 208 V, 240 V, 277 V, 347 V, 416 V, 480 V, or 600 V, perform voltage drop calculations using Electrical Code Table D3, demonstrate compliance with the Electrical Code, submit calculations to Consultant as a submittal, and include for larger conductors and conduits as required by the calculations.
- 3.1.15. Wire Splicing
- .1 Splice up to and including No. 6 AWG with nylon insulated expandable spring type connectors.
  - .2 Splice larger conductors using compression type connectors wrapped in heat shrink or cold shrink PVC insulation rated at the respective voltage. Provide a type of PVC insulation that is suitable for the installation environment. For applications exterior to the building, use cold shrink.
- 3.2. INSTALLATION OF BUILDING WIRES
- 3.2.1. Install all building wiring in conduit unless otherwise noted. Conduit to be sized to the electrical code unless noted on the drawings or in the specifications.
- 3.2.2. All conductors are to be colour coded. Provide colour tape at all terminations to identify all conductors in each run.
- 3.3. INSTALLATION OF TECK 90 CABLE, VARIABLE FREQUENCY DRIVE CABLE, ARMOURED CABLE OR ALUMINUM SHEATHED CABLE
- 3.3.1. Group cables wherever possible on channels.
- 3.3.2. Terminate cables in accordance with manufacturer's installation instructions.
- 3.3.3. Fastenings:
- .1 One-hole steel straps to secure surface cables 53 mm and smaller. Two-hole steel straps for cables larger than 53 mm.
  - .2 Channel type supports for two or more cables.
  - .3 Galvanized threaded rods: 6 mm diameter minimum to support suspended channels.

- .4 Pre-engineered support systems complying with CSA C22.2 No. 18.4 "Hardware for the support of conduit, tubing, and cable (Bi-national standard with UL 2239)."
- 3.3.4. Connectors:
  - .1 Watertight, approved for respective cables.
- 3.3.5. For single conductor cables, ground the sheath at the upstream (source) panel and provide insulated fibre plate at the load end, so as to prevent circulating sheath currents.
- 3.3.6. Where TECK 90 cable is run through or passes through a plenum space, install TECK 90 cable in conduit and comply with electrical code conduit fill percentage rules.
- 3.4. INSTALLATION OF MINERAL-INSULATED CABLE SYSTEM AND FIRE RATED TYPE RC CABLE SYSTEM
  - 3.4.1. General:
    - .1 Comply with: the requirements of the manufacturer's UL listing for the fire rated cable system and the manufacturer's written installation instructions.
    - .2 Provide all Products required by the manufacturer's UL listing to provide a fully certified system.
  - 3.4.2. Handling:
    - .1 Cable shall be uncoiled by rolling or rotating supply reel. Do not pull from coil periphery or centre.
  - 3.4.3. Splicing:
    - .1 Make all fire rated splices in the factory. In the event that a field splice is necessary, have the manufacturer's field technician make it in the field.
  - 3.4.4. Terminations:
    - .1 Make field made terminations using the cable manufacturer's termination kits. Use stripping tools, crimping tools and compression tools, available from the manufacturer for proper cable termination.
    - .2 Connections to ferrous cabinets for single conductor cables shall incorporate brass plates. Install per manufacturer's drawing.
    - .3 At cable terminations, use thermoplastic sleeving over bare conductors.
  - 3.4.5. Sheath induction reduction:
    - .1 When multi-phase circuits have paralleled single conductors, run cables in groups having one of each phase in each group.
    - .2 Separate each set of paralleled conductors by at least two single cable diameters.
  - 3.4.6. Exposed or Surface Installations:
    - .1 Secure cable(s) to the fire rated building structure using:
      - .1 Supporting methods outlined in the manufacturer's UL listing for the fire rated system utilized.
    - .2 Support fire rated cables at the intervals required by the manufacturer's UL listing.
  - 3.4.7. Wall or floor penetrations:
    - .1 Provide approved firestops for all penetrations.
    - .2 Neatly train and lace cable inside boxes, equipment, and panelboards.
    - .3 Where cables are buried in cast concrete or masonry, sleeve for entry of cables.

- .4 When penetrating a fire rated wall or fire rated floor, the cable must extend a minimum of 305 mm beyond the fire rated wall or fire rated floor. The 305 mm dimension can be in any direction as 305 mm of cable length is required to allow for proper heat dissipation such that cable terminations do not overheat.

### 3.5. FIELD QUALITY CONTROL

- 3.5.1. Prior to energizing wires/cables, measure insulation resistance of each wire/cable. Ensure readings are acceptable per installation recommendations. Tabulate and submit for approval as a submittal.
- 3.5.2. All Wires and Cables to be tested on site as defined in Section 26 08 01.00 – TECHNICAL SERVICES DIVISION STARTUP SERVICE and herein. Contractor to oversee all testing and correct any deficiencies noted.

### 3.6. INSTALLATION OF CONTROL CABLES

- 3.6.1. Install control cables in conduit.
- 3.6.2. Ground control cable shield.

END OF SECTION

26 05 29.00 Hangers and Supports

1. General

1.1. WORK INCLUDED

1.1.1. Section 26 05 01.00 – GENERAL INSTRUCTIONS FOR ELECTRICAL SECTIONS.

1.1.2. Section 26 05 04.00 – SUBMITTALS/SHOP DRAWINGS.

1.2. SHOP DRAWINGS AND PRODUCT DATA

1.2.1. Submit Shop Drawings and product data in accordance with Section 26 05 04.00 – SUBMITTALS/SHOP DRAWINGS.

1.2.2. Conduit and equipment provided under the Electrical division shall be complete with all necessary supports and hangers required for a safe and workmanlike installation.

1.3. WARRANTY

1.3.1. Provide a warranty in accordance with the requirements of Section 26 05 01.00 – GENERAL INSTRUCTIONS FOR ELECTRICAL SECTIONS.

2. Products

2.1. MATERIALS

2.1.1. Provide “U” type support strut as manufactured by Atkore Unistrut or Hilti.

3. Execution

3.1. INSTALLATION

3.1.1. All drilling for hangers, rod inserts and work of similar nature shall be done by this Division.

3.1.2. Auxiliary structural members shall be provided under the electrical section concerned where conduits or equipment must be suspended between the joists or beams of the structure, or where required to replace individual hanger to allow for installation on new services. Submit details for review as requested.

3.1.3. Depending on type of structure, hangers shall be either clamped to steel beams or joists, or attached to approved concrete inserts.

3.1.4. Approved type expansion shields and bolts may be used for conduit up to 103 mm diameter where the pre-setting of concrete inserts is not practical. Submit Shop Drawings.

3.1.5. Suspension from metal deck shall not be allowed unless specifically accepted by the Engineer’s Representative. Drawings of the proposed method of suspension must be submitted for review.

3.1.6. Hangers, hanger rods and inserts in all parking and ramp areas shall meet the requirements of CAN/CSA-S413 – Parking Structures (latest edition) and shall be of corrosion-resistant material or have an effective, durable corrosion resistant coating. Submit samples for approval.

3.1.7. Suspending one hanger from another shall not be permitted.

3.1.8. All hangers, supports, brackets and other devices used outside the building wall shall be galvanized. If galvanized components cannot be used submit samples of proposed substituted for review before installation.

3.2. HORIZONTAL RUNS ON THE ROOF

3.2.1. Where conduit or cables are run horizontally across a roof, conduit or cable shall be supported from pre-manufactured UV resistant sleepers with closed cell foam base.

3.2.2. Sleepers shall be "E-Z Sleeper" product from Pipe-Ease Inc. or approved equivalent.

3.2.3. Wood Blocks are not acceptable.

END OF SECTION

26 05 31.00 Splitters, Junction, Pull Boxes and Cabinets

1. General

1.1. WORK INCLUDED

1.1.1. Section 26 05 01.00 – GENERAL INSTRUCTIONS FOR ELECTRICAL SECTIONS.

1.1.2. Section 26 05 04.00 – SUBMITTALS/SHOP DRAWINGS.

1.1.3. Section 26 05 53.00 – IDENTIFICATION.

1.1.4. Section 26 05 63.00 – ACCESS DOORS AND ACCESSIBILITY.

1.2. REFERENCE

1.2.1. Ontario Electrical Safety Code, latest edition.

1.2.2. Ontario Building Code, latest edition.

1.2.3. CAN/ULC-S115, Fire Tests of Fire Stop Systems, latest edition.

1.3. SHOP DRAWINGS AND PRODUCT DATA

1.3.1. Submit shop drawings and product data for cabinets in accordance with specification Section 26 05 04.00 – SUBMITTALS/SHOP DRAWINGS.

1.4. WARRANTY

1.4.1. Provide a warranty in accordance with the requirements of Section 26 05 01.00 – GENERAL INSTRUCTIONS FOR ELECTRICAL SECTIONS.

2. Products

2.1. SPLITTERS

2.1.1. Sheet metal enclosure, welded corners and formed hinged cover suitable for locking in closed position. Provide CSA Type 1 enclosures in non-sprinklered environments and CSA Type 4/12 in sprinklered environments.

2.1.2. Main and branch lugs to match required size and number of incoming and outgoing conductors as indicated. Lugs to be dual rated for Copper/Aluminum (Cu/Al).

2.1.3. At least three spare terminals on each set of lugs in splitters less than 400 A.

2.2. JUNCTION AND PULL BOXES

2.2.1. Welded steel construction with screw-on flat covers for surface mounting.

2.2.2. Covers with 25 mm minimum extension all around, for flush-mounted pull and junction boxes.

2.3. CABINETS

2.3.1. Type E: sheet steel, hinged door and return flange overlapping sides, handle, lock and catch, for surface mounting.

2.3.2. Type T: sheet steel cabinet, with hinged door, latch, lock, 2 keys, containing 19 mm plywood backboard for surface or flush mounting. The plywood backboard is to have a fire-resistant coating on the front. Do not paint over plywood fire rating certification stamp.

### 3. Execution

#### 3.1. SPLITTER INSTALLATION

3.1.1. Install splitters and mount plumb, true and square to the building lines.

3.1.2. Extend splitters full length of equipment arrangement except where indicated otherwise.

#### 3.2. JUNCTION, PULL BOXES AND CABINETS INSTALLATION

3.2.1. Install pull boxes in inconspicuous but accessible locations.

3.2.2. Mount cabinets with top not higher than 2000 mm above finished floor.

3.2.3. Install terminal block as indicated in Type T cabinets.

3.2.4. Only main junction and pull boxes are indicated. Install pull boxes as follows:

- .1 A conduit run exceeds 30 m and;
- .2 360 degree of combined bends between pull boxes for power conduits or 180 degree of combined bends between pull boxes for communication and low voltage conduits.

#### 3.3. IDENTIFICATION

3.3.1. Provide equipment identification in accordance with Section 26 05 53.00 – IDENTIFICATION.

3.3.2. Install identification labels indicating system name, voltage, and phase.

END OF SECTION

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26 05 32.00 Outlet Boxes, Conduit Boxes and Fittings

1. General
  - 1.1. WORK INCLUDED
    - 1.1.1. Section 26 05 01.00 – GENERAL INSTRUCTIONS FOR ELECTRICAL SECTIONS.
  - 1.2. REFERENCES
    - 1.2.1. Ontario Electrical Safety Code, latest edition.
    - 1.2.2. Ontario Building Code, latest edition.
    - 1.2.3. CAN/ULC-S115, Fire Tests of Fire Stop Systems, latest edition.
  - 1.3. WARRANTY
    - 1.3.1. Provide a warranty in accordance with the requirements of Section 26 05 01.00 – GENERAL INSTRUCTIONS FOR ELECTRICAL SECTIONS.
2. Products
  - 2.1. OUTLET AND CONDUIT BOXES GENERAL
    - 2.1.1. Size boxes in accordance with the electrical code.
    - 2.1.2. Square or larger outlet boxes as required for special devices.
    - 2.1.3. Gang boxes where wiring devices are grouped.
    - 2.1.4. Blank cover plates for boxes without wiring devices.
    - 2.1.5. 347 V outlet boxes for 347 V switching devices.
    - 2.1.6. Combination boxes with barriers where outlets for more than one system are grouped.
  - 2.2. SHEET STEEL OUTLET BOXES
    - 2.2.1. Electro-galvanized steel single and multi-gang flush device boxes for flush installation, minimum size 75 mm x 50 mm x 38 mm or as indicated. 100 mm square outlet boxes when more than one conduit enters one side with extension and plaster rings as required.
    - 2.2.2. Provide cast FS aluminum boxes with factory-threaded hubs and mounting feet for surface wiring of switches and receptacles connected to rigid conduit.
    - 2.2.3. Provide electro-galvanized steel utility boxes for surface mounted boxes connected to surface-mounted EMT conduit, minimum size 100 mm x 54 mm x 48 mm.
    - 2.2.4. Square or octagonal outlet boxes for lighting fixture outlets.
    - 2.2.5. Square outlet boxes with extension and plaster rings for flush mounting devices in finished plaster or tile walls.
  - 2.3. MASONRY BOXES
    - 2.3.1. Electro-galvanized steel masonry single and multi-gang boxes for devices flush mounted in exposed block walls.

2.4. CONCRETE BOXES

2.4.1. Electro-galvanized sheet steel concrete type boxes for flush mount in concrete with matching extension and plaster rings as required.

2.5. OUTLET BOXES FOR NON-METALLIC SHEATHED CABLE

2.5.1. Electro-galvanized, sectional, screw ganging steel boxes, minimum size 75 mm x 50 mm x 63.5 mm with two double clamps to take non-metallic sheathed cables.

3. Execution

3.1. INSTALLATION

3.1.1. Support boxes independently of connecting conduits.

3.1.2. Fill boxes with paper, sponges or foam or similar approved material to prevent entry of debris during construction. Remove upon completion of work.

3.1.3. For flush installations mount outlets flush with finished wall using plaster rings to permit wall finish to come within 6 mm of opening.

3.1.4. Provide correct size of openings in boxes for conduit, mineral insulated and armoured cable connections. Reducing washers are not allowed.

3.1.5. Except where firestops are required by the building code "Firestops" article and related articles for "Storage Garage Considered as a Separate Building" and "Fire Separations for Horizontal Service Spaces," non-combustible electrical outlet boxes that penetrate a vertical fire separation or a membrane forming part of an assembly required to have a fire-resistance rating, do not require firestops provided,

.1 they do not exceed:

.1 160 cm<sup>2</sup> (0.016 m<sup>2</sup>) each in area, AND

.2 an aggregate area of 650 cm<sup>2</sup> (0.065 m<sup>2</sup>) in any 9.3 m<sup>2</sup> of surface area, AND

.2 The annular space between the membrane and the box does not exceed 3 mm.

3.1.6. Where the conditions of clause 3.1.5 are not met, provide firestops for the outlet boxes that have an FT rating not less than the fire-resistance rating for the fire separation.

3.1.7. Opposing outlets on non-fire rated partition walls shall have a minimum 150 mm horizontal separation. Outlets shall not be mounted back to back.

3.1.8. Conform to the firestops requirements of the building code: unless provided with firestops in accordance with CAN/ULC-S115, "Fire Tests of Fire Stop Systems" that have an FT rating not less than the fire-resistance rating for the fire separation, electrical outlet boxes on opposite sides of a vertical fire separation required to have a fire-resistance rating shall be separated by a horizontal distance of not less than 600 mm.

END OF SECTION

26 05 34.00 Conduits, Conduit Fasteners and Fittings

1. General

1.1. WORK INCLUDED

- 1.1.1. Section 26 05 01.00 – GENERAL INSTRUCTIONS FOR ELECTRICAL SECTIONS.
- 1.1.2. Section 26 05 31.00 – SPLITTERS, JUNCTION, PULL BOXES AND CABINETS
- 1.1.3. Section 26 05 32.00 – OUTLET BOXES, CONDUIT BOXES AND FITTINGS

1.2. REFERENCES

- 1.2.1. CAN/CSA C22.2 No.18 - Outlet Boxes, Conduit Boxes, and Fittings, latest edition.
- 1.2.2. CSA C22.2 No.45.1 - Electrical Rigid Metal Conduit - Steel, latest edition.
- 1.2.3. CSA C22.2 No.56 - Flexible Metal Conduit and Liquid-Tight Flexible Metal Conduit, latest edition.
- 1.2.4. CSA C22.2 No.83 - Electrical Metallic Tubing, latest edition.
- 1.2.5. CSA C22.2 No.211.2 - Rigid PVC (Unplasticized) Conduit, latest edition.
- 1.2.6. CAN/CSA C22.2 No.227.3 - Flexible Non-metallic Tubing, latest edition.
- 1.2.7. CSA C22.2 No.227.1 - Electrical Non-Metallic Tubing, latest edition.

1.3. WARRANTY

- 1.3.1. Provide a warranty in accordance with the requirements of Section 26 05 01.00 – GENERAL INSTRUCTIONS FOR ELECTRICAL SECTIONS.

2. Products

2.1. CONDUITS

- 2.1.1. Electrical rigid metal conduit: to CSA C22.2 No.45.1, galvanized steel or aluminum threaded.
- 2.1.2. Epoxy coated conduit: to CSA C22.2 No.45, with zinc coating and corrosion resistant epoxy finish inside and outside.
- 2.1.3. Electrical metallic tubing (EMT): to CSA C22.2 No.83, with couplings.
- 2.1.4. Rigid PVC conduit: to CSA C22.2 No.211.2.
- 2.1.5. Flexible metal conduit: to CSA C22.2 No.56, steel or liquid-tight flexible metal.
- 2.1.6. Electrical non-metallic tubing (ENT): to CSA C22.2 No. 227, with couplings.

2.2. CONDUIT FASTENINGS

- 2.2.1. Applications other than those stated below:
  - .1 One-hole steel straps to secure surface conduits NPS 2 and smaller. Two-hole steel straps for conduits larger than NPS 2.
  - .2 Beam clamps to secure conduits to exposed steel work.
  - .3 Channel type supports for two or more conduits at 1 m on centre.

- .4 Hot dipped galvanized threaded rods, 6 mm dia. minimum, to support suspended channels.
  - .5 For non-fire rated applications, pre-engineered support systems complying with CSA C22.2 No. 18.4 "Hardware for the support of conduit, tubing, and cable (Bi-national standard with UL 2239)."
- 2.2.2. Indoor pools (natatoriums): pool spaces, pool change rooms, pool mechanical rooms, and related pool areas that are subject to corrosion:
- .1 Subject to the "Rigid PVC conduit" rules in Section 12 of the Electrical Code and provided that the conduits are not installed in a plenum, use FT-4 rated, rigid PVC 2-hole straps to support single PVC conduits.
    - .1 Use fastening method/material suitable for ISO 9223 "Corrosion of metals and alloys - Corrosivity of atmospheres — Classification, determination and estimation" Corrosivity Categories C4, C5, and CX.
- 2.3. CONDUIT FITTINGS
- 2.3.1. Fittings: manufactured for use with conduit specified. Coating: same as conduit.
  - 2.3.2. Factory 90 degree elbow where 90 bends are required for 27 mm and larger conduits when a hydraulic bender is not used.
  - 2.3.3. Connectors, and couplings for EMT conduit are to be set-screw steel type. Below the level of suspended ceilings, in a sprinklered environment, provide watertight fittings and "O" rings on all conduit runs and when conduit is terminated at any piece of electrical equipment.
  - 2.3.4. Provide plastic bushings for all connectors, rigid nipples and rigid conduit 35 mm or larger.
- 2.4. EXPANSION FITTINGS FOR RIGID CONDUIT
- 2.4.1. Watertight expansion fittings with integral bonding jumper suitable for linear expansion and 19 mm deflection in all directions.
- 2.5. FISH CORD
- 2.5.1. Fish cord to be made of polypropylene.
3. Execution
- 3.1. INSTALLATION
- 3.1.1. Do not embed conduits in horizontal concrete floor/ceiling slabs and instead install conduits below the ceiling slab in the ceiling space, unless written consent for embedded conduits is received from the Engineer's Representative. Assume installation of conduits in the ceiling space as a basis of bid. The clauses in this and other spec sections related to conduits embedded in concrete slabs only apply if written consent has been granted by the Engineer's Representative.
  - 3.1.2. Install conduits to conserve headroom in exposed locations and cause minimum interference in spaces through which they pass.
  - 3.1.3. Do not install conduits, associated raceway system, or devices on the surface of, or within 100 mm of the underside of roof decks.
  - 3.1.4. Conceal conduits except in mechanical and electrical service rooms or in unfinished areas. Conduits to have their own support system and are to be supported independently of the ceiling grid or ceiling support system.

- 3.1.5. Where vertically run conduit passes through a slab, Contractor to provide a 100 mm high concrete pad with the pad extending 100 mm on all sides of the conduit.
- 3.1.6. Use electrical metallic tubing (EMT) conduit except where specified otherwise.
- 3.1.7. Use epoxy coated conduit in corrosive areas.
- 3.1.8. Use rigid galvanized steel threaded conduit where conduit is subject to mechanical damage.
- 3.1.9. Use rigid PVC conduit underground or in corrosive areas and where indicated.
- 3.1.10. Indoor pools (natatoriums): Subject to the "Rigid PVC conduit" rules in Section 12 of the Electrical Code and provided that the conduits/boxes are not installed in a plenum, use FT-4 rated, rigid PVC conduit and boxes in pool spaces, pool change rooms, pool mechanical rooms, and related pool areas that are subject to corrosion.
- 3.1.11. Use flexible metal conduit for connection to motors or vibrating equipment in dry areas, connection to recessed luminaires without a prewired outlet box, connection to surface or recessed luminaires and work in movable metal partitions. Ensure slack is provided in wiring connections to equipment which contains moving parts.
- 3.1.12. Use liquid tight flexible metal conduit for connection to motors or vibrating equipment in damp, wet or corrosive locations. Use only liquid tight fittings when using liquid tight flexible metal conduit. Liquid tight flexible metal conduit to have a jacket with an FT6 rating when used in plenums otherwise provide a minimum FT4 rating. Ensure slack is provided in wiring connections to equipment which contains moving parts.
- 3.1.13. Use explosion proof flexible connection for connection to explosion proof motors.
- 3.1.14. Install conduit sealing fittings in hazardous areas. Fill with compound.
- 3.1.15. Minimum conduit size for lighting and power circuits: NPS 21 mm, unless otherwise noted on the Drawings.
- 3.1.16. Minimum conduit size for data / voice cabling: as indicated on drawings, otherwise 27 mm.
- 3.1.17. Install EMT conduit from a raised floor branch circuit panel to outlet boxes located in sub floor.
- 3.1.18. Install EMT conduit from a raised floor branch circuit panel to junction box in sub-floor. Run flexible metal conduit from junction box to outlet boxes for equipment connections in sub-floor.
- 3.1.19. Bend conduit cold. Replace conduit if kinked or flattened more than 1/10th of its original diameter.
- 3.1.20. Mechanically bend steel conduit over 21 mm diameter.
- 3.1.21. Field threads on rigid conduit must be of sufficient length to draw conduits up tight.
- 3.1.22. Install fish cord in empty conduits.
- 3.1.23. Run two 27 mm spare conduits up to ceiling space and two 27 mm spare conduits down to sub-floor space from each flush panel. Terminate these conduits in 152 x 152 x 102 mm junction boxes or in case of an exposed concrete slab, terminate each conduit in flush concrete or surface type box.
- 3.1.24. Remove and replace blocked conduit sections. Do not use liquids to clean out conduits.
- 3.1.25. Dry conduits out before installing wire.

- 3.1.26. All cutting and patching of masonry/concrete floors, walls, and roof for electrical services shall be by this Division. Obtain approval from the Landlord and/or structural Engineer's Representative before cutting any structural walls or floors. Cutting and drilling shall only be at times allowed by the Landlord. Check and verify the location of existing mechanical and electrical services in walls and below the floor slab in all areas requiring core drilling and cutting. Protect all tenant areas where core drilling occurs. Carefully chip top and bottom of slab to expose rebar to minimize cutting of rebar when core drilling. Provide x-ray study before drilling or cutting where required by the Landlord and/or structural Engineer's Representative.
- 3.1.27. Provide sleeves for all new conduit passing through floor and roof slabs, beams, concrete walls and slab to slab partitions, etc.
- 3.1.28. Where cables and conduits pass through partitions and through floors that are not fire rated, provide an air-tight seal around the cables and conduits.
- 3.1.29. Where cables and conduits pass through floors and fire rated walls, pack space between conduit (or cable) and sleeve with approved firestops as specified in Section 26 05 01.00 – GENERAL INSTRUCTIONS FOR ELECTRICAL SECTIONS.
- 3.1.30. Prior to installation of any wire or cable in direct buried conduits or the conduits in an underground duct bank, pull through each conduit a flexible mandrel not less than 300 mm long and size for the internal diameter of conduit, followed by stiff bristle brush to remove sand, earth and other foreign matter. Avoid disturbing or damaging conduits where concrete has not set completely. Provide photo and video evidence of compliance with this clause and send to Engineer's Representative for review within 24 hours of Work occurring.
- 3.1.31. Upsize conduits and boxes where required to accommodate voltage drop calculations required by Section 26 05 21.00 – WIRES AND CABLES UNDER 2000 V.
- 3.2. SURFACE CONDUITS
  - 3.2.1. Run parallel or perpendicular to building lines.
  - 3.2.2. Locate conduits behind infrared or gas fired heaters with 1.5 m clearance.
  - 3.2.3. Run conduits in flanged portion of structural steel.
  - 3.2.4. Group conduits wherever possible on suspended or surface mounted channels.
  - 3.2.5. Do not pass conduits through structural members, except as indicated.
  - 3.2.6. Do not locate conduits less than 75 mm parallel to steam or hot water lines with minimum of 25 mm at crossovers.
  - 3.2.7. Conduits must not be used to support other conduits.
- 3.3. CONCEALED CONDUITS
  - 3.3.1. Run parallel or perpendicular to building lines.
  - 3.3.2. Do not install horizontal runs in masonry walls.
  - 3.3.3. Do not install conduits in terrazzo or concrete toppings.

26 05 83.00 Sleeves

1. General

1.1. WORK INCLUDED

- 1.1.1. Section 26 05 01.00 – GENERAL INSTRUCTIONS FOR ELECTRICAL SECTIONS.

## 1.2. WARRANTY

- 1.2.1. Provide a warranty in accordance with the requirements of Section 26 05 01.00 – GENERAL INSTRUCTIONS FOR ELECTRICAL SECTIONS.

## 2. Products

### 2.1. MATERIALS

- 2.1.1. Sleeves passing through stud partitions shall be 0.75 mm 22 US Gauge steel.
- 2.1.2. Sleeves passing through masonry walls shall be Schedule 40 steel pipe.
- 2.1.3. Sleeves passing through floors in finished areas and concealed spaces may be sheet metal or factory fabricated reusable type.
- 2.1.4. Where a housekeeping pad cannot be installed, sleeves passing through floors with waterproof membrane shall have a flashing collar, 50 mm wide at the membrane level. Flashing collar shall be continuously welded to sleeve. Sleeves shall extend 50 mm above the finished floor and shall be Schedule 40 steel pipe.
- 2.1.5. Where conduits pass through exterior foundation walls 6 mm thick steel sleeve of inside diameter not less the 75 mm greater than the outside diameter of the pipe shall be used and shall be complete with anchor collar. Thunderline Link-Seal wall seal or approved equal shall be used for the annular space between the sleeve and the conduit. A reinforced concrete bridge shall be installed between the wall and the adjacent undisturbed soil.
- 2.1.6. Provide adequate bracing for support of sleeves during concrete and masonry work.
- 2.1.7. Unless otherwise specified on the drawings, sleeves passing through the roof shall be liquid tight flexible conduit flashing consisting of a gooseneck shaped aluminum flashing sleeve with an integral deck flange, EPDM end cap seal and EPDM base seal.

## 3. Execution

### 3.1. INSTALLATION

- 3.1.1. Arrange for all chases and formed openings in walls and floors as required by the Electrical Division for the Electrical services. These chases and openings shall not be larger than necessary to accommodate the equipment and services. Advise on these requirements well in advance, before the concrete is poured and the walls are built. All necessary sleeves and inserts shall be supplied by this Division.
- 3.1.2. Chases and openings not located in accordance with the above provisions shall be made at the expense of this Division. Cutting of structural members shall not be permitted without specified written acceptance of the Engineer's Representative.
- 3.1.3. Provide sleeves for all service penetrations through walls, partitions, floor slabs, plenums and similar barriers. At non-rated barriers fill the annular space between the service and the sleeve with fire rated insulation as specified for rated separations and caulk around the edges with a minimum 12 mm thick of fire rated compound or acoustic non-setting mastic.
- 3.1.4. Through all fire or smoke separations, after testing, firestop the annular space between conduit sleeves.

- 3.1.5. Where-holes are to be installed in existing structure, contractor is to core drill the-holes required. Contractor is required to scan all areas prior to coring and confirm layout with structural engineer prior to completing work. When installing sleeves in existing structures, sleeves shall be provided as specified complete with a combination puddle/anchor flange bolted to the floor. Seal watertight between the flange and the floor.
- 3.1.6. All sleeves are to extend 150 mm above finished floor to accommodate a 100 mm concrete pad. Contractor to pour the concrete pad with the pad extending 100 mm on all sides of the sleeve.

END OF SECTION

26 05 88.00 Cutting and Patching

1. General

1.1. WORK INCLUDED

1.1.1. Section 26 05 01.00 – GENERAL INSTRUCTIONS FOR ELECTRICAL SECTIONS.

1.2. WARRANTY

1.2.1. Provide a warranty in accordance with the requirements of Section 26 05 01.00 – GENERAL INSTRUCTIONS FOR ELECTRICAL SECTIONS.

2. Products

2.1. MATERIALS

2.1.1. All services and materials used for the cutting and patching shall meet all requirements specified in Div. 00, and Section 26 05 01.00, and shall be carried out by experienced workers.

2.1.2. Include for all cutting and patching for all Electrical services.

3. Execution

3.1. INSTALLATION

3.1.1. Cut all openings no larger than is required for the services. Core drill for individual services.

3.1.2. Obtain approval from the structural Engineer's Representative before cutting or core drilling any openings or-holes in slabs or structural elements.

3.1.3. Locate all openings in structure elements requiring cutting and patching, and x-ray the structure to obtain Structural Engineer's Representative's approval prior to cutting or core drilling of existing structure. Make adjustments to location of openings as required to minimize cutting of rebar, and completely avoiding electrical conduit.

.1 Cut-holes through slabs only.

.2 Do not cut-holes through beams.

.3 Holes to be cut are 200 mm (Diameter) or smaller only.

.4 Maintain at least 100 mm clear from all beam faces. Space at least 3-hole diameters on Centre.

.5 For-holes that are required closer than 25% of slab span from the supporting beam face, use cover meter above the slab to clear slab top bars.

.6 For-holes that are required within 50% of slab span, use cover meter underside of slab to clear slab bottom bars.

3.1.4. X-ray scanning:

.1 X-rays shall be performed by a qualified technician, in a safe manner and in accordance with all applicable regulations governing this activity. The company shall be licensed by the Canadian Nuclear Safety Commission (CNSC), and all radiography work shall be performed in accordance with the Nuclear Safety and Control Act.

- .2 Follow any safety requirements stipulated by the property manager.
  - .3 Minimum requirements: All people must be evacuated within a radius of 10 m from each exposure location. Prior to conducting exposures verify this "safe zone". If the 10 m radius includes public areas such as a sidewalk, lobby, or elevator, these areas must be controlled (e.g. elevators shut down or prevented from stopping on floors at which exposures are taking place). In addition, if exposure locations are near the walls of adjacent tenants, ensure the notification and evacuation of people within the 10 m radius. The 10 m radius applies to the camera floor and the floor directly below only. The qualified technician shall ensure adequate precautions for the additional floors above and below the camera floor.
- 3.1.5. Patch all openings after services have been installed to match the surrounding finishes.
  - 3.1.6. In existing areas all cutting, and core drilling for individual services except where specifically noted, is part of this division work.
  - 3.1.7. The cost of x-ray scanning, cutting, patching and finishing is included in this division contract.

END OF SECTION

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26 09 24.00 Lighting Control Equipment – Addressable Low Voltage

1. General

1.1. WORK INCLUDED

- 1.1.1. Section 26 05 01.00 – GENERAL INSTRUCTIONS FOR ELECTRICAL SECTIONS.
- 1.1.2. Section 26 05 04.00 – SUBMITTALS/SHOP DRAWINGS.
- 1.1.3. Section 26 51 13.00 – LIGHTING EQUIPMENT.
- 1.1.4. Lighting Control Sequence of Operations as attached to Specifications or as shown on drawings.

1.2. REFERENCES

- 1.2.1. CAN/CSA-C22.2 No. 141, Emergency Lighting Equipment, latest edition.
- 1.2.2. CAN/CSA-C22.2 No. 205, Signal Equipment, latest edition.
- 1.2.3. American National Standards Institute/Institute of Electrical and Electronic Engineers (ANSI/IEEE)
- 1.2.4. International Electrotechnical Commission (IEC)
- 1.2.5. National Electrical Manufacturers Association (NEMA)
- 1.2.6. Underwriters Laboratories, Inc. (UL)
- 1.2.7. UL 508 – Standard for Industrial Control Equipment
- 1.2.8. UL 916 – Standard for Energy Management Equipment
- 1.2.9. UL 924 – Standard for Emergency Lighting and Power Equipment

1.3. SUMMARY

- 1.3.1. This specification is intended to fully describe all of the design, engineering, programming, hardware, software, ancillary devices and associated technical services required to provide a building-wide networked lighting control system. This system is specified to perform scheduled and automated lighting control sequences.
- 1.3.2. Lighting Control System includes computer-based software that provides control, configuration, monitoring and reports. System includes the following components:
  - .1 Energy Control Unit
  - .2 System Server
  - .3 0-10 V Dimming, Fixed Output Ballasts or 0-10 V LED Drivers
  - .4 System Field Devices (Input and Output Modules)
  - .5 Occupancy Sensors – Low Voltage
  - .6 Photo Sensors – Low Voltage
  - .7 Wall stations – Low Voltage
  - .8 Lighting Control System Software - Graphical User Interface based
  - .9 Communication Wire
  - .10 Area Lighting Controllers and/or Room Controllers (to dim/switch a group of luminaires)
  - .11 Interface to Audio Visual equipment (for integration with 3rd party LCD Touch Screen Panel)

- .12 Interface to BACnet
- .13 Interface to customizable Energy dashboard

#### 1.4. DESCRIPTION OF SYSTEM

- 1.4.1. The work covered in this section is subject to the requirements in the General Conditions of the Specifications. Contractor shall coordinate the work in this section with the trades covered in other sections of the specification to provide a complete and operable system.
- 1.4.2. Extent of the lighting control system work is indicated by drawings and by the requirements of this section. It is the intent of this section to provide an integrated, energy saving lighting control system as described herein from a single supplier. Contractor is responsible for confirming that all components and accessories of the lighting control system interoperate as a single system.
- 1.4.3. Contractor shall ensure that lighting system control devices and assemblies are fully compatible and can be integrated into a system that operates as described in the lighting control notes on drawings and as described within this specification. Any incompatibilities between devices, assemblies, and system controllers shall be resolved between the contractor and the System Provider, as required to ensure proper system operation and maintainability.
- 1.4.4. The lighting control system shall include a fully distributed WAN/LAN network of global controller/routers, individually addressable System Field Devices that are not integral to luminaires, sensors, switches, relays and other ancillary devices required for a complete and operable system. The system WAN/LAN start-up shall be by the control system Manufacturer or Contractors certified by the Manufacturer.
- 1.4.5. The lighting control system shall utilize non-proprietary industry standard 0-10 V dimming or fixed output ballasts and/or 0-10 V LED drivers, occupancy sensors, daylight sensors, etc.
- 1.4.6. UL 924 listed devices shall have the ability to control 120 V / 277 V load.
- 1.4.7. System software interface shall have the ability to notify communication failures to system users via system & email messages. Email messages shall be available in html and text formats.
- 1.4.8. On-going system expansion, service and support shall be available from multiple factory certified vendors. Recommended service agreements may be submitted at the time of bid complete with manufacturers suggested inventory and pricing for system parts and technical support labor.
- 1.4.9. The electrical drawings may show a lighting control system designed with a specific manufacturer as a Basis of Design. There are pre-approved alternate manufacturers listed herein, which are acceptable lighting control systems to be used; however, by using pre-approved alternate manufacturers, the Contractor accepts responsibility and associated costs for all required modifications to circuitry, devices, and wiring, etc. as required to suit the alternate pre-approved manufacturer's lighting control system. The Contractor shall provide complete engineered shop drawings (including power and control wiring) with deviations from the original design highlighted for review and approval prior to rough-in. Where additional components or devices are required to meet the same design intent as indicated in the drawings and specifications, the Contractor shall include for all costs.

#### 1.5. LIGHTING CONTROL APPLICATIONS

- 1.5.1. Provide a minimum application of lighting controls as follows:
  - .1 Space Control Requirements – Provide occupancy/vacancy sensors as shown and noted on the electrical drawings. Occupancy/vacancy sensors to provide Manual- or

- Partial-ON functionality or Automatic-ON as described in the drawings and specifications.
- .2 Bi-Level Lighting – Provide multi-level controls in all spaces as indicated in the electrical drawings and specifications.
  - .3 Task Lighting / Plug Loads – Where indicated on the drawings, provide automatic shut off of plug loads and task lighting. For spaces with multiple occupants a single shut off consistent with the overhead lighting may be used for the area.
  - .4 Daylit Areas – Provide daylight-responsive automatic control in all spaces (conditioned or unconditioned) and as indicated in the drawings, where daylight contribution is available. Daylighting control shall operate as follows:
    - .1 All luminaires within defined daylight zones shall be controlled separately from luminaires outside of daylit zones.
    - .2 Daytime setpoints for total ambient illumination (combined daylight and electric light) levels that initiate dimming shall be programmed in compliance with relevant local building energy codes and/or as indicated in the drawings and specifications.
    - .3 Multiple-level switched daylight harvesting controls may be utilized for areas marked on drawings.
    - .4 Provide smooth and continuous daylight dimming for areas marked on drawings. Daylighting control system may be designed to turn off electric lighting when daylight is at or above required lighting levels, only if system functions to turn lamps back on at dimmed level, rather than turning full-on prior to dimming.
- 1.5.2. All enclosed rooms shall have controls that allow for independent control of each local control zone. Rooms larger than 300 square feet shall instead have at least four preset lighting scenes unless otherwise specified. Occupancy / vacancy sensors shall be provided to turn off all lighting in the space. Spaces with up to four moveable walls shall include controls that can be reconfigured when the room is partitioned.
- 1.6. SHOP DRAWINGS AND PRODUCT DATA
- 1.6.1. Submit Shop Drawings and product data in accordance with Section 26 05 04.00 – SUBMITTALS/SHOP DRAWINGS.
- 1.6.2. Submit manufacturer's data on lighting control system and components and the product data specified below at the same time as a package. Shop drawing submission shall include but not limited to the following:
- .1 Complete list of all parts needed to fully install selected system components.
  - .2 Composite wiring and/or schematic diagram of each control circuit as proposed to be installed. Submitted shop drawings shall detail control system, as supplied, including one-line diagrams, wire counts, coverage patterns, interconnection diagrams showing field-installed wiring and physical dimensions of each item.
  - .3 Coordination Drawings: Submit evidence that lighting controls are compatible with connected monitoring and control devices and systems specified in other Sections.
    - .1 Show interconnecting signal and control wiring and interfacing devices that prove compatibility of inputs and outputs.
    - .2 For networked controls, list network protocols and provide statements from manufacturers that input and output devices meet interoperability requirements of the network protocol.
    - .3 Show exact location of all digital devices, including at minimum sensors, load controllers, and switches for each area on reflected ceiling plans. Contractor

must provide AutoCAD and PDF format reflected ceiling plans. For sensors, prove sensor is suitable for the proposed application.

- 1.6.3. Provide room/area details including products and sequence of operation for each room or area. Illustrate typical acceptable room/area connection topologies.
- 1.6.4. Network riser diagram including floor and building level details. Include network cable specification and end-of-line termination details, if required. Illustrate points of connection to integrated systems. Coordinate integration with mechanical and/or other trades as required.
- 1.6.5. Software Operational Documentation:
  - .1 Software operating and upgrade manuals
  - .2 Program Software Backup: On portable memory storage device, USB stick, complete with data files.
  - .3 Printout of software application and graphic screens, or upon request, a live demonstration of Control, Configure and Analyze functionality or a video demonstrating above stated system capabilities.
- 1.6.6. Catalog sheets, specifications and installation instructions.
- 1.6.7. Operation and Maintenance Data: For each type of product to include in emergency, operation, and maintenance manuals.
- 1.6.8. Copy of applicable warranty.
- 1.6.9. Additional information as required on a project specific basis.
- 1.7. PROJECT CONDITIONS
  - 1.7.1. Do not install equipment until following conditions can be maintained in spaces to receive equipment:
    - .1 Ambient temperature: 0° to 40° C (32° to 104° F).
    - .2 Relative humidity: Maximum 90 percent, non-condensing.
- 1.8. WARRANTY
  - 1.8.1. Provide a five year limited manufacturer's warranty on all equipment to be free of defects in materials and workmanship.
  - 1.8.2. On-going system expansion, service and support shall be available from multiple factory certified vendors. Recommended service agreements shall be submitted at the time of bid complete with manufacturers suggested inventory and pricing for system parts and technical support labor.
2. Products
  - 2.1. MATERIALS
    - 2.1.1. Control system: by one manufacturer and assembled from compatible components.
  - 2.2. CENTRAL LIGHTING CONTROL SOFTWARE
    - 2.2.1. The system shall offer central lighting control for the facility lighting administrator to perform energy management, configuration maintenance, monitoring operations, and providing support to building occupants.

- 2.2.2. Native central control software shall be utilized for energy reporting status and complete programming without the need for any third party hardware or software. Systems that require any third party linked software or graphics is not acceptable.
- 2.2.3. Software shall provide information on general system settings via mouse click on a floor plan. Left clicking over a device on the graphical software interface shall show a description of the selected device/function attribute.
- 2.2.4. The system shall provide an Interactive, Web-based graphical user interface (GUI) showing floor plans and lighting layouts that are native to the lighting control software. The only means required to program and operate the lighting control system shall be programmed and operated from a user interface that is based on a plan view graphical screen on the user's computer or the lighting control system's main computer. Shall include the navigational features listed below to allow for user's orientation within the controlled space, geographic heading and/or landmarks:
- .1 Interactive;
  - .2 Vector based;
  - .3 Zoom;
  - .4 Rotate;
  - .5 Pan;
  - .6 Tilt.
- 2.2.5. The system shall allow the building operator to navigate through an entire facility both in two-dimensional and three-dimensional multi-floor view, allowing for fast and easy navigation.
- 2.2.6. Three-dimensional view shall exclude walls and other structural features to avoid shadowing and cluttering of the plan view.
- 2.2.7. Shall display multiple floors in single view resulting in easier system performance visualization for the entire site as well as individual zones or spaces.
- 2.2.8. The system shall allow system performance visualization across a portfolio of buildings via a single interface.
- 2.2.9. All programming, assignments of lighting loads to control strategies, lighting status and lighting energy reporting shall be native to the software and executed from this GUI. Editing shall be available from this GUI in a drag and drop format or from drop down menus without the need for any third party software. Systems that utilize or require third party linked graphics are unacceptable. The GUI shall continuously indicate the status of each connected device on the system and a warning indicator on the software if a device goes offline. Systems requiring spreadsheet editing for programming and that don't offer real time feedback are not acceptable.
- 2.2.10. Software settings and properties shall be selectable per individual device, room based, floor based or global building based.
- 2.2.11. Lighting Control Software interface shall provide current status and enable configuration of all system zones including selected individual luminaire availability, current light level, maximum light level, on/off status, occupancy status, and emergency mode (response to an emergency signal) status.
- 2.2.12. The system shall have the ability to display various lighting system parameters such as Lighting status (ON/OFF); Lighting levels, Load shedding status, or Lighting energy consumption, Occupancy status in a colorized gradient ("weather" map) type of graphical representation.
- 2.2.13. Energy Analysis data shall be exportable in CSV or image file formats.
- 2.2.14. The system shall allow import of native AutoCAD files.

- 2.2.15. Reporting feature shall be native to the lighting control software and capable of reporting the following parameters for each device and zone individually without requiring any third party hardware and software:
- .1 Energy consumption broken down by energy management strategy.
  - .2 Energy demand broken down by energy management strategy.
  - .3 Occupancy data by zone.
  - .4 Building wide occupancy status
  - .5 Time Schedule configuration status
  - .6 Lighting energy consumption in a color gradient (“weather map” type) view
  - .7 Energy performance reports shall be printable in a printer friendly format and downloadable for use in spreadsheet applications, etc.
- 2.2.16. The software shall offer user configurable fade times (up to 86400 seconds) for individual or group of luminaire during transition between scenes.
- 2.2.17. The system shall be programmable for Time Clock Scheduling of lights on or off via the Lighting Control Software interface.
- 2.2.18. There shall be an “Emergency Mode”, when activated through the system, that will immediately adjust lights to full light output and retain that level until the mode is deactivated in the event of an emergency. This setting shall override all other inputs. The system shall interface with the building emergency monitoring system at a convenient point and not require multiple connections.
- 2.2.19. All ballasts and/or drivers shall be centrally addressable, on a per luminaire or multiple luminaire/zone basis, through the Central Control Software. The basis of design shall utilize 0-10V Dimming, Fixed Output Ballasts and/or 0-10V LED Drivers connected to an Output Module. To simplify ongoing maintenance, the system shall not require manual recording of addresses for the purpose of start-up or reconfiguration.
- 2.2.20. System shall be capable of operating independent of building’s existing network infrastructure if desired and shall not rely on Tenant supplied PCs for operation.
- 2.2.21. Firewall Technologies & VLAN Configuration methods shall be utilized to separate tenants from the lighting control network and ensure the integrity of lighting control network.
- 2.2.22. The assignment of individual or group of system components to zones shall be performed via the Central Control Software such that physical rewiring will not be necessary when workspace reconfiguration or re-zoning is performed. Removal of covers, faceplates, ceiling tiles, etc. shall not be required.
- 2.2.23. Occupancy sensor time delays shall be configurable through software. Light level sensor parameters shall be configurable through software.
- 2.2.24. System shall auto-configure lighting controls for spaces that have been combined or divided temporarily by moving wall or similar systems.
- 2.2.25. System shall automatically lock wall stations and/or disable sensors based on one of the following system inputs: contact closure, a time schedule or the status of a monitored space.
- 2.2.26. The light management system shall be capable of interfacing digitally with a building automation system via BACnet/IP. The lighting control system shall be capable of communicating the status of output devices (lighting loads) as well as input devices (dry contacts, switches, occupancy sensors, vacancy sensors, and photocells) to the BAS. Building Automation System shall utilize data from lighting control system input devices such as occupancy sensors to determine the status (occupied/unoccupied) of the mechanical control zones and perform climate adjustments accordingly.

### 2.3. DIGITAL WALLSTATIONS

- 2.3.1. The system shall connect with the wall stations via field bus that carry low voltage control signals.
- 2.3.2. Software configurable wall stations shall provide on/off switching and dimming control for up to six lighting zones/ five lighting scenes per wall station or more with allowable multi-gang configurations.
- 2.3.3. Shall allow manual dimming of light levels and override of the time schedule.
- 2.3.4. Scenes/zones in the system control software shall be synchronized with the buttons on the wall station.
- 2.3.5. All wall stations shall be individually addressable & reconfigurable via System Control Software.
- 2.3.6. All wall stations shall feature status LED's
- 2.3.7. All wall stations shall be Class 2 Low Voltage devices.
- 2.3.8. All wall stations power source will be from the communication bus.
- 2.3.9. Communication shall be via NEC/CEC Class 2 communication wire.
- 2.3.10. Wall station configuration shall be via GUI in a drag and drop format.
- 2.3.11. Custom button cap configuration shall allow combination of scene & zone in one wall station.
- 2.3.12. Custom commands shall be applied to individual wall station buttons.
- 2.3.13. Wall station shall display its current status (zone/scene under system control or OFF) when motion is detected in the close proximity of the wall station
- 2.3.14. The following User Interface and custom labelling options shall be available:
  - .1 Up to five (5) scene switching & dimming
  - .2 Up to six (6) zone switching
  - .3 One (1) zone switching
- 2.3.15. Shall allow vacancy sensor configuration.
- 2.3.16. Dimensions shall meet NEMA WD-6 spec.
- 2.3.17. The following mounting options shall be supported:
  - .1 Mount in standard size wall box
  - .2 On mounting brackets for low voltage devices
- 2.3.18. Shall be used with "Decorator" style wall plate.

### 2.4. SYSTEM FIELD DEVICES

- 2.4.1. Shall provide a common interface to low voltage occupancy sensors and photo sensors via Input Modules. These modules shall automatically detect the type of devices they are connected to (i.e., photo sensor, occupancy sensor). Addresses to the field devices shall be assigned during system start-up. Upon establishing two way communication with the Energy Control Unit (ECU), these individually addressable modules shall enable each lighting component to be independently controlled and configured to best meet the needs of the facility. These modules shall connect directly to the NEC/CEC Class 2 communication bus.
- 2.4.2. System Field Devices shall be individually addressable via System Control Software.
- 2.4.3. System shall automatically address individual nodes during system start-up thus eliminating the need to pre-address devices or record serial numbers during installation.
- 2.4.4. Electrically rated for up to 24 VDC.

- 2.4.5. Shall connect to NEC/CEC Class 2 communication wire.
- 2.4.6. Shall retain all system settings in non-volatile memory.
- 2.4.7. Suitable for fixture or junction box mounting in standard 1/2" knockout (7/8" dia.)
  
- 2.5. AREA LIGHTING CONTROLLER/ROOM CONTROLLER
  - 2.5.1. Shall provide a common interface (DIM/SWITCH) to a group of 0-10V Dimming, Fixed Output Ballasts and/or 0-10V LED Drivers via field bus that carry low voltage control signals.
  - 2.5.2. Area Lighting Controllers shall be addressable via Control Software.
  - 2.5.3. System shall automatically address individual area lighting controllers during system start-up thus eliminating the need to pre-address devices or record serial numbers during installation.
  - 2.5.4. Electrical Maximum Load Ratings:
    - .1 20A 120-347 Vac Ballast
    - .2 20A 120-347 Vac Resistive
    - .3 20A 120-347 Vac Tungsten
    - .4 20A 120-347 Vac General Purpose
    - .5 1.5 HP 120-277 Vac Motor
  - 2.5.5. Communication shall be via NEC/CEC Class 2 communication wire.
  - 2.5.6. Control Options for:
    - .1 ON/OFF Switching
    - .2 Continuous 0-10V dimming
    - .3 Shall be able to communicate with 0-10V ballasts/drivers
  - 2.5.7. Shall be used for general purpose plug load control.
  - 2.5.8. Shall control up to 30 ballast/LED Drivers.
  - 2.5.9. Shall retain all system settings in non-volatile memory.
  - 2.5.10. Mechanically has mounting for standard 1/2" electrical box knockout.
  - 2.5.11. Colour to be selected by Architect/Engineer's Representative.
  - 2.5.12. UL916, UL924 & UL2043 listed.
  
- 2.6. DIGITAL DAYLIGHTING SENSORS
  - 2.6.1. Digital daylighting sensors shall work to provide automatic switching, bi-level, or tri-level or dimming daylight harvesting capabilities for any load type.
  - 2.6.2. Daylighting sensors shall be interchangeable without the need for rewiring.
  - 2.6.3. The indoor sensor range shall be between 0 and 750 FC.
  - 2.6.4. The outdoor sensor range shall be between 0 and 750 FC.
  - 2.6.5. Atrium sensor range shall be from 2 to 2,500 FC.
  - 2.6.6. Skylight sensor range shall be between 10 and 7,500 FC.
  - 2.6.7. The capability of ON/OFF, bi-level or tri-level switching, or dimming, for each controlled zone, depending on the selection of load controller(s) and load binding to controller(s).
  - 2.6.8. For dimming daylight harvesting, the photosensor shall provide the option, when the daylight contribution is sufficient, of turning lights off or dimming lights to a field-selectable minimum level.

- 2.6.9. Photosensors shall have a digital, independently configurable fade rate for both increasing and decreasing light level in units of percent per second.
- 2.6.10. Photosensors shall provide adjustable cut-off time. Cut-off time is defined by the number of selected minutes the load is at the minimum output before the load turns off. Selectable range between 0-240 minutes including option to never cut-off.
- 2.6.11. Optional wall switch override shall allow occupants to reduce lighting level to increase energy savings or, if permitted by system administrator, raise lighting levels for a selectable period of time or cycle of occupancy.

## 2.7. DIGITAL WALL OR CEILING MOUNTED OCCUPANCY SENSOR

- 2.7.1. Wall or ceiling mounted (refer to drawings) passive infrared (PIR), ultrasonic or dual technology digital (passive infrared and ultrasonic) occupancy sensor.
- 2.7.2. Digital Occupancy Sensors shall provide graphic LCD display for digital calibration and electronic documentation. Features include the following:
  - .1 Digital calibration and pushbutton configuration for the following variables:
    - .1 Sensitivity – 0-100% in 10% increments
    - .2 Time delay – 1-30 minutes in 1 minute increments
    - .3 Test mode – Five second time delay
    - .4 Detection technology – PIR, Ultrasonic or Dual Technology activation and/or re-activation.
    - .5 Walk-through mode
  - .2 Load parameters including Auto/Manual-ON, blink warning, and daylight enable/disable when photosensors are included in the DLM local network.
  - .3 Programmable control functionality including:
    - .1 Each sensor may be programmed to control specific loads within a local network.
    - .2 Sensor shall be capable of activating one of 16 user-definable lighting scenes.
    - .3 Adjustable retrigger time period for manual-on loads. Load will retrigger (turn on) automatically within a configurable period of time (default 10 seconds) after turning off.
    - .4 On dual technology sensors, independently configurable trigger modes are available for both Normal (NH) and After Hours (AH) time periods. The retrigger mode can be programmed to use the following technologies:
      - .5 Ultrasonic and Passive Infrared
      - .6 Ultrasonic or Passive Infrared
      - .7 Ultrasonic only
      - .8 Passive Infrared only
      - .9 Independently configurable sensitivity settings for passive infrared and ultrasonic technologies (on dual technology sensors) for both Normal (NH) and After Hour (AH) time periods.
  - .4 Communication shall be via Class 2 communication bus.
  - .5 Manual override of controlled loads.
  - .6 All digital parameter data programmed into an individual occupancy sensor shall be retained in non-volatile FLASH memory within the sensor itself. Memory shall have an expected life of no less than 10 years.
  - .7 Units shall not have any dip switches or potentiometers for field settings.

- 2.7.3. Multiple occupancy sensors may be installed in a room by simply connecting them to the free topology local network. No additional configuration will be required.
- 2.8. COMMUNICATION WIRE
- 2.8.1. The system shall have the capability to use both NEC/CEC Class 1 and Class 2 wiring to integrate peripheral devices such as ballasts/LED drivers, occupancy sensors, photo sensors, relay-based controls, area lighting controllers, and wall stations into a complete, networked programmable lighting control system.
- 2.8.2. Electrically uses NEC/CEC Class 2 Communication bus.
- 2.8.3. Multi-conductor cable with stranded-copper conductors.
- 2.8.4. Shall power photo sensors, PIR and dual-technology occupancy sensors.
- 2.8.5. Shall allow random devices connection without the need for special network channel termination.
- 2.8.6. Flame rated jacket for plenum use NFPA 262 (CSA: FT6, UL: CMP).
- 2.9. ENERGY CONTROL UNIT (ECU)
- 2.9.1. The Energy Control Unit (ECU) shall collect, process and distribute lighting control information to the system field devices and wall stations over NEC/CEC Class 2 communication bus. Each CU shall feature multiple NEC/CEC Class 2 communication channels that can control a large quantity of nodes (sensors, wall stations, 0-10V Dimming, Fixed Output Ballasts, 0-10V LED Drivers, etc.) per channel, per the manufacturers recommended maximum.
- 2.9.2. The ECU shall be the central intelligence point for the area it controls collecting signal information from sensors, wall stations and personal control software and determining appropriate brightness levels or on/off status for each luminaire or zone. The CU shall connect with a facility's or tenant's Local Area Network (LAN) via Ethernet to enable desktop personal control.
- 2.9.3. Ethernet communication ports that employ TCP/IP protocol shall be provided to simultaneously enable the following connections:
- .1 Lighting Control Network
  - .2 Tenant LAN Access Point
- 2.9.4. Shall have 8 ports that accept 18 AWG, pre-fabricated, polarity independent quick connecting NEC/CEC Class 2 communication bus.
- 2.9.5. Each CU channel shall support up to 100 nodes or 800 nodes in total.
- 2.9.6. Shall have status LEDs for the following:
- .1 Network activity on CU's Ethernet port/s
  - .2 CU channel status
  - .3 CU status
- 2.9.7. Shall enable the following functionalities:
- .1 Backup to and Restore from USB flash drives
  - .2 Cycle lights through 100%, 25% & 0% steps
  - .3 Disable/enable all controller functionalities
  - .4 IP Address Reset
  - .5 Electronically deactivate individual channels
- 2.9.8. Shall have configuration stored in non-volatile flash memory.

- 2.9.9. Shall mount in a standard 19" rack (1U width), or alternatively where no rack is shown, via an individual wall mount.
- 2.9.10. UL916 and UL924 listed.
- 2.10. SYSTEM SERVER (SSU)
- 2.10.1. The System Server shall host the lighting control system database for all the lighting control devices. In addition, it shall provide remote accessing capability to change system settings and/or parameters.
- 2.10.2. Server shall have the ability to:
- .1 Analyze system performance or energy data or generate system report;
  - .2 Record energy consumption with average sampling every 5 minutes for unlimited duration;
  - .3 Host the web interface required for the web enabled Personal Control Software or web based Central Control Software;
  - .4 Reside on a client server (virtual server);
  - .5 Interconnect with Control Units over standard Ethernet connection that employs TCP/IP protocol;
- 2.10.3. Each System Server shall have two Ethernet 10/100Base - Tx Cat 5 RJ45 ports that employ TCP/IP protocol.
- 2.10.4. Shall mount in a standard 19" rack (1U width), or alternatively where no rack is shown, via an individual wall mount.
- 2.11. EMERGENCY LIGHTING CONTROL DEVICES
- 2.11.1. Emergency Lighting Control Unit – A UL 924 listed device that monitors a switched circuit providing normal lighting to an area. The unit provides normal ON/OFF control of emergency lighting along with the normal lighting. Upon normal power failure the emergency lighting circuit will close, forcing the emergency lighting ON until normal power is restored. Features include:
- .1 120/277 volts, 50/60 Hz, 20 amp ballast rating
  - .2 Push to test button
  - .3 Auxiliary contact for remote test or fire alarm system interface
- 2.12. MANUFACTURERS
- 2.12.1. The following are acceptable manufacturers:
- .1 Legrand– Encelium
  - .2 Cooper Lighting Solutions
  - .3 Lutron – Athena
  - .4 Acuity – nLight
  - .5 Crestron – Commercial Lighting Controls

### 3. Execution

#### 3.1. PRE-INSTALLATION MEETING

3.1.1. A factory authorized manufacturer's representative shall provide the electrical contractor a functional overview of the lighting control system prior to installation. The contractor shall schedule the pre-installation site visit after receipt of approved submittals to review the following:

- .1 Confirm the location and mounting of all digital devices, with special attention to placement of occupancy and daylighting sensors.
- .2 Review the specifications for low voltage control wiring and termination.
- .3 Discuss the functionality and configuration of all products, including sequences of operation, per design requirements.
- .4 Discuss requirements for integration with other trades.

#### 3.2. INSTALLATION AND SERVICES

3.2.1. Locate and install equipment in accordance with manufacturer's recommendations and as indicated.

3.2.2. Install all devices and wiring in a professional manner. All line voltage connections to be tagged to indicate circuit and switched legs.

3.2.3. Install all room/area devices using manufacturer's factory-tested cable with pre-terminated connectors. If pre-terminated cable is not used for room/area wiring, test each field-terminated cable following installation and supply the lighting controls manufacturer with test results. Contractor to install any room to room network devices using manufacturer-supplied network wire. Low voltage wiring topology must comply with manufacturer's specifications. Contractor shall route network wiring as shown in submittal drawings as closely as possible, and shall document final wiring location, routing and topology on as built drawings.

3.2.4. Install the work of this Section in accordance with manufacturer's printed instructions unless otherwise indicated. Before start up, contractor shall test all devices to ensure proper communication.

3.2.5. Calibrate all sensor time delays and sensitivity to guarantee proper detection of occupants and energy savings.

- .1 Adjust time delay so that controlled area remains lighted while occupied.

3.2.6. Provide written or computer-generated documentation on the configuration of the system including room by room description including:

- .1 Sensor parameters, time delays, sensitivities, and daylighting setpoints.
- .2 Sequence of operation, (e.g. manual ON, Auto OFF. etc.)
- .3 Load Parameters (e.g. blink warning, etc.)

3.2.7. Post start-up tuning – After 30 days from occupancy contractor shall adjust sensor time delays and sensitivities to meet the Owner's requirements. Provide a detailed report to the Consultant/Owner of post start-up activity.

#### 3.3. FACTORY SERVICES

3.3.1. Upon completion of the installation, the manufacturer's factory authorized representative shall start up and verify a complete fully functional system.

3.3.2. The Electrical Contractor shall provide both the manufacturer and the Consultant with three weeks written notice of the system start up and adjustment date.

3.3.3. Upon completion of the system start up, the factory-authorized technician shall provide the proper training to the owner's personnel on the adjustment and maintenance of the system.

#### 3.4. SYSTEM START UP AND COMMISSIONING

3.4.1. If applicable, a commissioning agent will verify the installation and programming of all building systems, which includes the lighting control system. Manufacturer should include an extra day of technician's time to review the functionality and settings of the lighting control hardware with the commissioning agent, including reviewing submittal drawings and ensuring that instructions on how to configure each device are readily available. Manufacturer is NOT responsible for helping the commissioning agent inspect the individual devices. It will be the commissioning agent's responsibility to create and complete any forms required for the commissioning process, although the manufacturer or contractor may offer spreadsheets and/or printouts to assist the agent with this task.

3.4.2. The commissioning agent shall work with the electrical contractor during installation of the lighting control hardware to become familiar with the specific products. The agent may also accompany the manufacturer's technicians during their start-up work to better understand the process of testing, calibration and configuration of the products. However, the contractor and manufacturer shall ensure that interfacing with the agent does not prevent them from completing the requirements outlined in the contract documents.

#### 3.5. TESTING

3.5.1. Upon completion of all line, load and interconnection wiring, and after all luminaire are installed and lamped, a qualified factory representative shall completely configure and test the system.

3.5.2. At the time of checkout and testing, the owner's representative shall be thoroughly instructed in the proper operation of the system.

#### 3.6. TRAINING

3.6.1. Provide four half days of training for the Owner and the Owner's maintenance staff on the operation and maintenance of the system.

3.6.2. Training to be recorded for use by Owner in the future.

END OF SECTION

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26 24 17.00 Panelboards – Breaker Type

1. General

1.1. WORK INCLUDED

1.1.1. Section 26 05 01.00 – GENERAL INSTRUCTIONS FOR ELECTRICAL SECTIONS.

1.1.2. Section 26 05 04.00 – SUBMITTALS/SHOP DRAWINGS.

1.1.3. Section 26 05 05.00 – MOUNTING HEIGHTS.

1.1.4. Section 26 05 53.00 – IDENTIFICATION.

1.1.5. Section 26 28 21.00 – MOULDED CASE AND INSULATED CASE CIRCUIT BREAKERS.

1.2. REFERENCES

1.2.1. CSA C22.2 No. 29 – Panelboards and Enclosed Panelboards, latest edition.

1.2.2. CSA C22.2 No. 5 – Molded-case circuit breakers, molded-case switches and circuit-breaker enclosures, latest edition.

1.3. SHOP DRAWINGS AND PRODUCT DATA

1.3.1. Submit Shop Drawings and product data in accordance with Section 26 05 04.00 – SUBMITTALS/SHOP DRAWINGS.

1.3.2. Drawings to include electrical detail of panel, branch breaker type, quantity, ampacity and enclosure dimension.

1.3.3. Submit initial power system study at the same time as shop drawings for electrical distribution equipment, such that the Engineer can review the adequacy of equipment interrupting capacity or withstand ratings, prior to equipment being released for manufacture. In situations where the entire study cannot be submitted with the electrical distribution shop drawings, submit at a minimum a preliminary short circuit study for review.

1.4. WARRANTY

1.4.1. Provide a warranty in accordance with the requirements of Section 26 05 01.00 – GENERAL INSTRUCTIONS FOR ELECTRICAL SECTIONS.

2. Products

2.1. PANELBOARDS

2.1.1. Panelboards: product of one manufacturer.

2.1.2. Install circuit breakers in panelboards before shipment.

2.1.3. In addition to CSA requirements, manufacturer's nameplate must show fault current that the panel including all breakers have been built to withstand.

2.1.4. Panelboards to have the following minimum ratings for interrupting capacity or as indicated on the drawings or panel schedules.

.1 120/208 V panelboards – 10 kA

.2 347/600 V panelboards – 22 kA

- 2.1.5. Sequence phase bussing with odd numbered breakers on left and even on right, with each breaker identified by permanent number identification as to circuit number and phase.
- 2.1.6. Panelboards: mains, number of circuits, and number and size of branch circuit breakers as indicated. Provide an additional 20% of space within each panelboard in addition to what is shown on the drawings when a separate panel schedule is not provided for a specific panelboard.
- 2.1.7. Two keys for each panelboard and key panelboards alike.
- 2.1.8. Panelboards to be copper bus unless identified otherwise.
- 2.1.9. Where identified on the drawings or schedules, provide a neutral bus sized to 200 % of the mains rating for panels.
- 2.1.10. Mains: suitable for bolt-on breakers.
- 2.1.11. Trim with concealed front bolts and hinges, for all panelboards other than those used in residential suites.
- 2.1.12. Trim and door finish: baked grey enamel.
- 2.1.13. Enclosure to be CSA Type 1 with drip hood with the exception of recessed panel enclosures which are to be CSA Type 1.
- 2.1.14. Provide Surge Protection Device where shown on Drawings.
- 2.1.15. Series ratings aren't acceptable.
- 2.1.16. All lugs to be dual rated for Copper/Aluminum (Cu/Al).
- 2.1.17. Where panelboards shown on the Drawings are indicated as Power Panels (PPs) or Distribution Panels (DPs), provide panelboard models that by default accommodate a minimum of 3 feeder circuit breakers rated for a minimum of 200 A – 3P, in addition to those shown on the Drawings.
  
- 2.2. MOULDED CASE CIRCUIT BREAKERS
  - 2.2.1. Bolt-on moulded case circuit breaker: quick-make, quick-break type, for manual and automatic operation with temperature compensation for 40 deg. C. ambient.
  - 2.2.2. Common-trip breakers: with single handle for multi-pole applications.
  - 2.2.3. Moulded case circuit breaker to operate automatically by means of thermal and magnetic tripping devices to provide inverse time current tripping and instantaneous tripping for short circuit protection.
  - 2.2.4. Main breaker, where indicated: separately mounted on top or bottom of panel to suit cable entry. When mounted vertically, down position should open breaker.
  - 2.2.5. Lock-on devices for 10 % of 15 to 30 A breakers installed. Turn over unused lock-on devices to Owner.
  - 2.2.6. Where breakers are identified to feed high intensity discharge (HID) lighting, provide breakers that are rated and designed for use with HID lighting.
  - 2.2.7. Provide one breaker per designated breaker space. Multiple breakers contained in one housing or twin breakers are not acceptable.
  - 2.2.8. Breaker terminals to be dual rated for Copper/Aluminum (Cu/Al).
  - 2.2.9. Comply with Section 26 28 21.00 - MOULDED CASE AND INSULATED CASE CIRCUIT BREAKERS.

2.3. EQUIPMENT IDENTIFICATION

- 2.3.1. Provide equipment identification in accordance with Section 26 05 53.00 – IDENTIFICATION.
- 2.3.2. Complete circuit directory with typewritten legend showing location and load of each circuit.

2.4. MANUFACTURERS

- 2.4.1. The following are acceptable manufacturers:
  - .1 Schneider Electric
  - .2 Eaton Cutler-Hammer
  - .3 Siemens
  - .4 ABB

3. Execution

3.1. INSTALLATION

- 3.1.1. Locate panelboards as indicated and mount securely, plumb, true and square, to adjoining surfaces.
- 3.1.2. Install surface mounted panelboards on galvanized strut channel stand-offs or on fire rated plywood backboards. The plywood backboards are to be as per Section 26 05 01.00 – GENERAL INSTRUCTIONS FOR ELECTRICAL SECTIONS.
- 3.1.3. Mount panelboards at height specified in Section 26 05 05.00 – MOUNTING HEIGHTS.
- 3.1.4. Connect loads to circuits.
- 3.1.5. Connect neutral conductors to common neutral bus with respective neutral identified.

END OF SECTION

26 27 19.00 Multi-Outlet Assemblies

1. General

1.1. WORK INCLUDED

1.1.1. Section 26 05 01.00 – GENERAL INSTRUCTIONS FOR ELECTRICAL SECTIONS.

1.1.2. Section 26 05 04.00 – SUBMITTALS/SHOP DRAWINGS.

1.1.3. Section 26 27 26.00 – WIRING DEVICES.

1.1.4. Section 26 05 21.00 – WIRES AND CABLES UNDER 2000 V.

1.2. REFERENCE

1.2.1. CSA C22.2 No. 62 – Surface Metal Raceways, latest edition.

1.2.2. ANSI/TIA 569-C – Commercial Building Standard for Telecommunications Pathways and Spaces, latest edition.

1.3. SHOP DRAWINGS AND PRODUCT DATA

1.3.1. Submit shop drawings and product data in accordance with Section 26 05 04.00 – SUBMITTALS/SHOP DRAWINGS.

1.3.2. If variations from the reviewed shop drawings occur during the installation of the system, final as built drawings shall be submitted for each floor that has been altered.

1.4. WARRANTY

1.4.1. Provide a warranty in accordance with the requirements of Section 26 05 01.00 – GENERAL INSTRUCTIONS FOR ELECTRICAL SECTIONS.

2. Products

2.1. SURFACE RACEWAY FOR WIRING DEVICES

2.1.1. The raceway and all system components must be CSA listed.

2.1.2. Raceway to be constructed of galvanized steel unless stainless steel is identified on the drawings. Raceway base shall have a minimum thickness of 1.3 mm (0.050 in.) and the cover shall have a minimum thickness of 1 mm (0.040 in.).

2.1.3. Raceways shall be painted with the colour to be determined by the architect at the time of shop drawing stage. Submit available colour selections with the shop drawing submittal.

2.1.4. The raceway shall have a minimum of two compartments unless additional compartments are identified on the drawings. Assembled base and cover shall be a 120 mm (4¾ in.) wide for two section raceway and additional 60 mm (2-3/8 in.) for every additional compartment with a minimum depth of 45 mm (1¾ in.) unless specified otherwise on the drawing.

- 2.1.5. The raceway shall be a modular design with separate covers for each compartment divided with fixed barriers. The compartment covers to be snap on design, which snap side by side on a common base. Raceway covers shall be enhanced tamper resistant form, where screws are only necessary on access plates and the covers of certain fittings, but not on standard cover lengths. A tool shall be provided to form the shape in the cover flange necessary to maintain enhanced tamper resistance when the cover is field cut. Another tool shall be provided for cutting covers to ensure square field cuts.
- 2.1.6. Provide all required fittings including, but not limited to flat, internal and external elbows, couplings for joining raceway sections, wire clips, blank end fittings, entrance fittings, and a full complement of device mounting brackets and plates. All fittings shall be an enhanced tamper resistant form and shall be divided with barriers and made to match the size of the accompanying raceway base.
- 2.1.7. Provide full capacity corner elbows and tee fittings to maintain a controlled 50 mm (2 in.) cable bend radius, which meets the specifications for Fiber Optic cabling and exceeds the TIA 569 requirements for communications pathways.
- 2.1.8. Device brackets shall be provided in sizes to match the width of the raceway and with mounting-holes appropriately located to ensure proper mounting of devices in all compartments.
- 2.1.9. Device plates shall be made in any length from 152.4 mm (6 in.) to 1.5 m (60 in.) with cut outs to accommodate various combinations of power and/or communication devices in all compartments. Device plates shall be 152.4 mm (6 in.) and 304.8 mm (12 in.) long with a flange to overlap the joint of the adjacent cover. Provide 5% additional device plates for future additions or modifications for all types of devices installed.

## 2.2. MANUFACTURERS

- 2.2.1. The following are approved manufacturers:
- .1 CER - Canadian Electric Raceways.
  - .2 Legrand – Wiremold.
  - .3 Hubbell.

## 3. Execution

### 3.1. INSTALLATION

- 3.1.1. Prior to and during installation, refer to system layout or approval drawings containing all elements of the system. Installer shall comply with detailed manufacturer's instruction sheets, which accompany system components, as well as complete system instruction sheets, whichever is applicable.
- 3.1.2. All raceway systems shall be mechanically continuous and connected to all electrical outlets, boxes, device mounting brackets, and cabinets, also in accordance with manufacturer's installation sheets.
- 3.1.3. All metal raceway shall be electrically continuous and bonded in accordance with the respective electrical code for proper grounding.
- 3.1.4. Provide a separate insulated bonding conductor in the entire length of the raceway.
- 3.1.5. Raceway shall be securely supported at intervals not exceeding 1500 mm (5 ft.) or in accordance with manufacturer's installation sheets.

- 3.1.6. All raceway systems shall be installed complete, including insulating bushings and inserts where required by manufacturer's installation sheets. All unused raceway openings shall be closed.
- 3.1.7. Locate wireway and wiring devices as shown.
- 3.1.8. Install supports, elbows, tees, connectors and fittings. Keep the number of elbows, offsets and connections to a minimum.
- 3.1.9. Install wiring and wiring devices as indicated.
- 3.1.10. Install barriers to separate different wiring systems.

END OF SECTION

26 27 26.00 Wiring Devices

1. General

1.1. WORK INCLUDED

- 1.1.1. Section 26 05 01.00 – GENERAL INSTRUCTIONS FOR ELECTRICAL SECTIONS.
- 1.1.2. Section 26 05 04.00 – SUBMITTALS/SHOP DRAWINGS.
- 1.1.3. Section 26 05 05.00 – MOUNTING HEIGHTS.
- 1.1.4. Section 26 05 53.00 – IDENTIFICATION.
- 1.1.5. Section 26 51 13.00 – LIGHTING EQUIPMENT.

1.2. REFERENCES

- 1.2.1. CSA C22.2 No. 42, General use receptacles, attachment plugs, and similar wiring devices, latest edition.

1.3. SHOP DRAWINGS AND PRODUCT DATA

- 1.3.1. Submit shop drawings and product data in accordance with Section 26 05 04.00 – SUBMITTALS/SHOP DRAWINGS.

1.4. WARRANTY

- 1.4.1. Provide a warranty in accordance with the requirements of Section 26 05 01.00 – GENERAL INSTRUCTIONS FOR ELECTRICAL SECTIONS.

2. Products

2.1. SWITCHES

- 2.1.1. 20 A, single pole, double pole, three-way, or four-way specification grade switches. Voltage rating of the switch to be as per the contract documents.
- 2.1.2. Manually-operated general purpose switches with following features:
  - .1 Terminal-holes approved for No. 10 AWG wire.
  - .2 Silver alloy contacts.
  - .3 Urea or melamine moulding for parts subject to carbon tracking.
  - .4 Suitable for back and side wiring.
  - .5 Decora Style specification grade Rocker switch.
  - .6 Colour to be selected by Architect/Engineer's Representative.
- 2.1.3. Toggle operated locking fully rated for tungsten filament and fluorescent lamps, and up to 80 % of rated capacity of motor loads.

2.2. RECEPTACLES

- 2.2.1. All receptacles to be specification grade.
- 2.2.2. Duplex receptacles, Decora style CSA Type 5-15 R, 125 V, 15 A, U ground, with following features:

- .1 Thermoplastic with impact-resistant nylon face moulded housing.
- .2 Suitable for No. 10 AWG for back and side wiring.
- .3 Eight back wired entrances, four side wiring screws.
- .4 Triple wipe contacts and riveted grounding contacts.

#### 2.2.3.

#### 2.2.4. Receptacles to be coloured as follows:

- .1 Normal Power – Colour to be selected by Architect/Engineer's Representative.

#### 2.2.5. Electrical Contractor shall coordinate with furniture supplier to identify switched circuits prior to installation.

### 2.3. MANUFACTURERS

#### 2.3.1. The switches and wiring devices shall be of one manufacturer throughout the project.

#### 2.3.2. The following are acceptable manufacturers:

- .1 Legrand.
- .2 Hubbell.
- .3 Cooper.
- .4 Leviton.

### 2.4. DIMMERS

#### 2.4.1. Dimmers shall be 600 W, 1500 W, 2000 W.

- .1 Full range, continuously variable control of light intensity.
- .2 Vertical slider allowing the light level to be set by the user.
- .3 Slide to Off.
- .4 Capable of operating at rated capacity.
- .5 Power failure memory.
- .6 Dimmers shall be available for direct control of incandescent, magnetic low voltage, electronic low voltage, fluorescent, and LED.

#### 2.4.2. Electronic (solid-state) Low Voltage (ELV) transformer dimmers (incandescent).

- .1 Circuitry designed to control the input of Electronic (solid state) Low Voltage transformers.
- .2 Control up to 600 W of Electronic Low Voltage load.
- .3 Reset-able overload protection when capacity is exceeded.

#### 2.4.3. LED dimmers.

- .1 Slide to Off only. Must match driver and LED requirements.

#### 2.4.4. Manufacturers

- .1 Lutron Maestro Series.
- .2 Leviton True Touch Series.

### 2.5. SPECIAL WIRING DEVICES

#### 2.5.1. Pilot lights as indicated, with neon type 0.04 W, 125 V lamp and red plastic lens flush type.

2.6. COVER PLATES

- 2.6.1. Cover plates for wiring devices.
- 2.6.2. Cover plates from one manufacturer throughout project.
- 2.6.3. Sheet steel utility box cover for wiring devices installed in surface-mounted utility boxes.
- 2.6.4. Provide stainless steel cover plates, suitable for the respective device, for all devices mounted in flush-mounted outlet boxes located in finished areas.
- 2.6.5. Sheet metal cover plates for wiring devices mounted in surface-mounted FS or FD type conduit boxes.
- 2.6.6. Weatherproof rain tight while-in-use metal cover, complete with gaskets for duplex receptacles located outside or as indicated.
- 2.6.7. Weatherproof rain tight while-in-use metal cover, complete with gaskets for single receptacles or switches located outside or as indicated.

3. Execution

3.1. INSTALLATION

3.1.1. Switches:

- .1 Install single throw switches with handle in "UP" position when switch closed.
- .2 Install switches in gang type outlet box when more than one switch is required in one location.
- .3 Where line voltage controls are used, install an identified conductor at each location of a manual or automatic control device in accordance with electrical code requirements.
- .4 Mount toggle switches at height specified in Section 26 05 05.00 – MOUNTING HEIGHTS or as indicated.

3.1.2. Receptacles:

- .1 Install receptacles in gang type outlet box when more than one receptacle is required in one location.
- .2 Mount receptacles at height specified in Section 26 05 05.00 – MOUNTING HEIGHTS or as indicated.
- .3 Where split receptacle has one portion switched, mount vertically and switch upper portion.

3.1.3. Dimmers:

- .1 Install dimmers as indicated. Provide suitable clearances in multi-gang boxes as recommended by the manufacturer to maintain the dimmer rating.
- .2 Coordinate the dimmer selection with the ballast/driver to be controlled, to ensure compatibility.
- .3 Where line voltage controls are used, install an identified conductor at each location of a manual or automatic control device in accordance with electrical code requirements.

3.1.4. Cover plates:

- .1 Protect stainless steel cover plate finish with paper or plastic film until painting and other work is finished.
- .2 Install suitable common cover plates where wiring devices are grouped.
- .3 Do not use cover plates meant for flush outlet boxes on surface-mounted boxes.

3.1.5. Labelling

- .1 Provide labels with panel name and circuit number on all receptacles in conformance with Section 26 05 53.00 – IDENTIFICATION.

END OF SECTION

26 28 14.00 Fuses Low Voltage

1. General

1.1. WORK INCLUDED

1.1.1. Section 26 05 01.00 – GENERAL INSTRUCTIONS FOR ELECTRICAL SECTIONS.

1.1.2. Section 26 05 04.00 – SUBMITTALS/SHOP DRAWINGS.

1.2. REFERENCES

1.2.1. CSA C22.2 No. 248, Low Voltage Fuses, latest edition.

1.3. SHOP DRAWINGS AND PRODUCT DATA

1.3.1. Submit shop drawings and product data in accordance with Section 26 05 04.00 – SUBMITTALS/SHOP DRAWINGS.

1.3.2. Submit fuse performance data characteristics for each fuse type and size above 100 A. Performance data to include: average melting time-current characteristics, I<sub>2</sub>t (for fuse coordination), and peak let-through current.

1.4. MAINTENANCE MATERIALS

1.4.1. Three spare fuses of each type and size installed 600 A. and above.

1.4.2. Six spare fuses of each type and size installed up to and including 400 A.

1.5. DELIVERY AND STORAGE

1.5.1. Ship fuses in original containers.

1.5.2. Do not ship fuses installed in switchboard.

1.5.3. Store fuses in original containers in moisture free location.

1.6. WARRANTY

1.6.1. Provide a warranty in accordance with the requirements of Section 26 05 01.00 – GENERAL INSTRUCTIONS FOR ELECTRICAL SECTIONS.

2. Products

2.1. FUSES GENERAL Fuses: product of one manufacturer.

2.1.2. Fuses to have an indicating window to identify when the fuse has been blown.

2.2. FUSE TYPES

2.2.1. Class L fuses.

.1 Type L1, time delay, capable of carrying 500 % of its rated current for 10 s minimum.

.2 Type L2, fast acting.

2.2.2. Class J fuses.

.1 Type J1, time delay, capable of carrying 500 % of its rated current for 10 s minimum.

- .2 Type J2, fast acting.
- 2.2.3. Class R fuses. For UL Class RK1 fuses, peak let-through current and I<sub>2</sub>t values not to exceed limits of CSA C22.2 No. 248.
  - .1 Type R1, (UL Class RK1), time delay, capable of carrying 500 % of its rated current for 10 s minimum, to meet UL Class RK1 maximum let-through limits.
  - .2 Type R2, time delay, capable of carrying 500 % of its rated current for 10 s minimum.
  - .3 Type R3, (UL Class RK1), fast acting Class R, to meet UL Class RK1 maximum let-through limits.
- 2.2.4. Class C fuses.
- 2.2.5. Fuses for Motors:
  - .1 All fuses for motor loads are to be time-delay type.
- 2.3. FUSE STORAGE CABINET
  - 2.3.1. Fuse storage cabinet, manufactured from 2.0 mm thick aluminum 750 mm high, 600 mm wide, 300 mm deep, hinged, lockable front access door, B-LINE model 243012 + 2 shelves FCS2412, finished in accordance with Section 26 05 01.00 – GENERAL INSTRUCTIONS FOR ELECTRICAL SECTIONS.
- 2.4. FUSE PULLER
  - 2.4.1. Provide a fuse puller for each size of fuse to be located in the fuse storage cabinet. Fuse puller to be clearly labelled for the appropriate building and fuse cabinet. Fuse puller to be equal to the Ideal Safe-T-Grip Fuse Puller.
- 2.5. MANUFACTURERS
  - 2.5.1. The following are acceptable manufacturers:
    - .1 Mersen
    - .2 Cooper-Bussman
    - .3 Littelfuse
- 3. Execution
  - 3.1. INSTALLATION
    - 3.1.1. Install fuses in mounting devices immediately before energizing circuit.
    - 3.1.2. Ensure correct fuses fitted to physically match mounting devices.
      - .1 Install Class R rejection clips for Class R fuses.
    - 3.1.3. Ensure correct fuses fitted to assigned electrical circuit.
    - 3.1.4. Where UL Class RK1 fuses are specified, install warning label "Use only UL Class RK1 fuses for replacement" on equipment.

END OF SECTION

26 28 21.00 Moulded Case and Insulated Case Circuit Breakers

1. General

1.1. WORK INCLUDED

1.1.1. Section 26 05 01.00 – GENERAL INSTRUCTIONS FOR ELECTRICAL SECTIONS.

1.1.2. Section 26 05 04.00 – SUBMITTALS/SHOP DRAWINGS.

1.2. REFERENCES

1.2.1. CSA C22.2 No. 5 – Molded-Case Circuit Breakers, Molded-Case Switches and Circuit-Breaker Enclosures, latest edition.

1.3. SHOP DRAWINGS AND PRODUCT DATA

1.3.1. Submit Shop Drawings and product data in accordance with Section 26 05 04.00 – SUBMITTALS/SHOP DRAWINGS

1.3.2. Include time-current characteristic curves for breakers with ampacity of 400 A and over or with interrupting capacity of 22,000 A symmetrical (RMS) and over at system voltage.

1.3.3. Submit initial power system study at the same time as shop drawings for electrical distribution equipment, such that the Engineer can review the adequacy of equipment interrupting capacity or withstand ratings, prior to equipment being released for manufacture. In situations where the entire study cannot be submitted with the electrical distribution shop drawings, submit at a minimum a preliminary short circuit study for review.

1.4. WARRANTY

1.4.1. Provide a warranty in accordance with the requirements of Section 26 05 01.00 – GENERAL INSTRUCTIONS FOR ELECTRICAL SECTIONS.

2. Products

2.1. BREAKERS GENERAL

2.1.1. Bolt-on moulded case circuit breaker: quick-make, quick-break type, for manual and automatic operation with temperature compensation for 40 deg. C. ambient.

2.1.2. Common-trip breakers: with single handle for multi-pole applications.

2.1.3. Magnetic instantaneous trip elements in circuit breakers to operate only when value of current reaches setting. Trip settings on breakers with adjustable trips to range from 3-8 times current rating.

2.1.4. Circuit breakers with interchangeable trips as indicated.

2.1.5. Where a circuit breaker shown on the Drawings is rated 1200 A or higher, provide the following:

.1 Energy reducing maintenance switching (ERMS) system that provides a means to reduce arcing fault clearing time, with the following features:

.1 Positive feedback status indication LED light to indicate the status of the system, built into the equipment housing the breaker.

- .2 A selector switch to turn the system on and off, built into the equipment housing the breaker.
- .3 A selector switch to be located remote from the equipment and a 24 V DC circuit, to turn the system on and off.
- .4 Ability for circuit breaker trip unit to have two trip curves – the first for normal operation and the second for when a qualified person is working within the arc flash boundary (maintenance mode).
- .5 Ability for second trip curve to be set so that the breaker operates faster and more sensitively.
- .6 Pickup settings as low as 2.5 times breaker rating plug.
- .7 Provide system with documentation and equipment lamacoids that explain how the system works.

## 2.2. THERMAL MAGNETIC BREAKERS

- 2.2.1. Moulded case circuit breaker to operate automatically by means of thermal and magnetic tripping devices to provide inverse time current tripping and instantaneous tripping for short circuit protection.

## 2.3. MAGNETIC BREAKERS

- 2.3.1. Moulded case circuit breakers to operate automatically by means of magnetic tripping devices to provide instantaneous tripping for short circuit protection.

## 2.4. FUSED THERMAL MAGNETIC BREAKERS

- 2.4.1. Fused thermal magnetic breakers with current limiting fuses internally mounted. Time current limiting characteristics of fuses coordinated with time current tripping characteristics of circuit breaker. Coordination to result in interruption by breaker of fault-level currents up to interrupting capacity of breaker. Fuses individually removable and interlocked with breaker. The removal of fuse cover, blowing of a fuse or removal of a fuse, shall trip the breaker.

## 2.5. SOLID STATE TRIP BREAKERS

- 2.5.1. Circuit breaker to operate by means of an adjustable solid-state trip unit with associated current monitors and self-powered shunt trip to provide inverse time current trip under overload condition.
- 2.5.2. Electronic trip with true RMS sensing.
- 2.5.3. Use current transformers to ensure accurate measurement from low current up to high currents.
- 2.5.4. Electronic trip with thermal memory/imaging.
- 2.5.5. Adjustable solid state trip unit complete with:
  - .1 Adjustable long time pick-up
  - .2 Adjustable long time delay
  - .3 Adjustable short time pick-up (where S indicated on Drawings)
  - .4 Adjustable short time delay (where S indicated on Drawings)
  - .5 Adjustable instantaneous pick-up (where I indicated on Drawings)
  - .6 Adjustable ground fault pick-up (where G indicated on Drawings)
  - .7 Adjustable ground fault delay (where G indicated on Drawings)

- .8 Long time, short time, instantaneous tripping for phase and ground fault short circuit protection as noted above.
- 2.5.6. Trip unit consisting of adjustable protection settings set by rotating switch or digital keypad, and rating plug.
- 2.5.7. Provide features listed below:
  - .1 For breakers rated less than 1200 A:
    - .1 Comply with the requirements for breakers rated 1200 A and above in the "Breakers General" section above.
    - .2 Provide trip unit with local trip indication and ability to locally and remotely indicate reason for trip (e.g. overload, short circuit, or ground fault).
- 2.6. INSULATED CASE CIRCUIT BREAKERS GENERAL
- 2.6.1. Use insulated case circuit breakers where shown on the Drawings.
- 2.6.2. Provide draw out type electrically operated circuit breaker with remote open/close key switch.
- 2.6.3. Provide circuit breaker operating mechanisms that are two-step, fully-stored energy devices for quick-make, quick-break operation with a maximum of a five-cycle closing time. Open-close-open (O-C-O) cycle possible without recharging. Provide motor operator that automatically charges when circuit breaker is closed. Charge the closing springs (step one) upon actuation of the operating handle or an operation cycle of the circuit breaker motor and close the circuit breaker contact (step two) upon operation of a local "close" button. Automatically charge the opening springs when closing the circuit breaker contacts.
- 2.6.4. Provide breaker that is 100 % continuous current rated in its enclosure.
- 2.6.5. Provide kirk keys where indicated on the Drawings.
- 2.6.6. Completely isolate current-carrying components from the accessory mounting area and double insulate current-carrying components from the operator with accessory cover in place.
- 2.6.7. Provide padlocking provisions furnished to receive up to three padlocks when circuit breaker is in the open position, positively preventing unauthorized closing of the circuit breaker contacts.
- 2.6.8. Provide provisions for up to two key locks allowing locking in the disconnected position. Provide provisions for locking in the connected, test and disconnected positions by padlock or key lock.
- 2.6.9. Provide buttons, with lockable clear cover, located on the face of the circuit breaker, to open and close the circuit breaker and indicators to show the position of the circuit breaker contacts, status of the closing springs, and circuit breaker position in the cell. Provide an indicator that shows "charged-not OK to close" if closing springs are charged but circuit breaker is not ready to close. Provide circuit breaker racking system that has positive stops at the connected, test, disconnected and withdrawn positions.
- 2.6.10. Equip circuit breaker with an interlock to discharge the stored energy spring before the circuit breaker can be withdrawn from its cell. Provide circuit breaker that provides a positive ground contact check between the circuit breaker and cell when the accessory cover is removed while the circuit breaker is in the connected, test or disconnected positions.
- 2.6.11. Provide interlocks to prevent circuit breaker draw out when in closed position and to prevent closing unless fully engaged or in test position. Provide breaker that is trip free during racking operation.
- 2.6.12. Provide as an option, primary connectors that can be rotated to provide flexible vertical or horizontal connections. Ensure front connections are available as an option for shallow depth equipment designs.

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- 2.6.13. Provide ready-to-close contact that indicates remotely that the circuit breaker is "ready to close." The circuit breaker is ready to close when it is open, spring mechanism is charged, a maintained closing order is not present, a maintained opening order is not present, and the circuit breaker is in an operational position.
- 2.6.14. Provide secondary control wiring that is front accessible and available in cage clamp or ring terminal connections. Provide secondary wiring that is inaccessible when switchboard door is closed.
- 2.6.15. Provide long service life circuit breaker. Provide circuit breakers certified to perform a minimum of 10,000 operations without maintenance where circuit breaker frames are 3000 A and below.
- 2.6.16. Equip circuit breaker with a visual contact wear indicator.
- 2.6.17. Provide circuit breaker arc chutes that don't contain asbestos.
- 2.6.18. Trip Unit
- .1 Comply with the requirements noted above in the Solid State Trip Breakers section.
  - .2 Provide trip units that are removable to allow for field upgrades.
  - .3 Provide trip units that are capable of the following types of ground-fault protection: residual, zero sequence, source ground return, and modified differential. Ground-fault sensing systems may be changed in the field.
  - .4 Ensure neutral current transformers are available for four-wire systems.
  - .5 Provide trip units that have real time metering and metering functions that include current, voltage, power and frequency. Provide metering accuracy of 1.5 % current, 0.5 % voltage, and 2 % power. Accuracies listed are total system including CT and meter and are of reading, not full scale, in a range of 5 – 500 %.
  - .6 Provide trip unit with provisions for communications on a network.
- 2.7. ACCESSORIES
- 2.7.1. Include:
- .1 shunt trip, when electrically operated or when indicated.
  - .2 auxiliary switches, when electrically operated or when indicated.
  - .3 motor-operated mechanism, when electrical operation indicated.
  - .4 on-off locking device.
  - .5 handle mechanism.
  - .6 Where a breaker serves a fire pump, the breaker is to come complete with auxiliary contacts that are to be monitored by the fire alarm system.
- 2.8. MANUFACTURERS
- 2.8.1. The following are acceptable manufacturers:
- .1 Schneider Electric
  - .2 Eaton Cutler-Hammer
  - .3 Siemens
  - .4 ABB

3. Execution

3.1. INSTALLATION

3.1.1. Install circuit breakers as indicated.

3.1.2. Contractor to wire any neutral CT's to the breaker trip unit where required by the breaker ground fault detection system or as otherwise required by the manufacturers instructions.

END OF SECTION

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26 28 23.00 Disconnect Switches – Fused and Non-Fused

1. General

1.1. WORK INCLUDED

1.1.1. Section 26 05 01.00 – GENERAL INSTRUCTIONS FOR ELECTRICAL SECTIONS.

1.1.2. Section 26 05 04.00 – SUBMITTALS/SHOP DRAWINGS.

1.1.3. Section 26 05 53.00 – IDENTIFICATION.

1.2. REFERENCE

1.2.1. CSA C22.2 No. 4 – Enclosed Switches, latest edition.

1.2.2. CSA C22.2 No. 39 – Fuse-holder Assemblies, latest edition.

1.3. SHOP DRAWINGS AND PRODUCT DATA

1.3.1. Submit Shop Drawings and product data in accordance with Section 26 05 04.00 – SUBMITTALS/SHOP DRAWINGS.

1.3.2. Submit initial power system study at the same time as shop drawings for electrical distribution equipment, such that the Engineer can review the adequacy of equipment interrupting capacity or withstand ratings, prior to equipment being released for manufacture. In situations where the entire study cannot be submitted with the electrical distribution shop drawings, submit at a minimum a preliminary short circuit study for review.

1.4. WARRANTY

1.4.1. Provide a warranty in accordance with the requirements of Section 26 05 01.00 – GENERAL INSTRUCTIONS FOR ELECTRICAL SECTIONS.

2. Products

2.1. DISCONNECT SWITCHES

2.1.1. Fusible, horsepower rated disconnect switch in CSA Type 3R enclosure, size as indicated.

2.1.2. Non-fusible, horsepower rated disconnect switch in CSA Type 3R enclosure, with minimum 10 kA Short Circuit Current Rating (SCCR), with manufacturer listed series rating with upstream breaker / fuse where available fault current exceeds 10 kA and with UL series rating label on disconnect switch, size as indicated.

2.1.3. Provision for padlocking in on-off switch position by three locks.

2.1.4. Mechanically interlocked door to prevent opening when handle in ON position.

2.1.5. Fuses: size as indicated, class J, current limiting, in accordance with Section 26 28 14.00 – FUSES LOW VOLTAGE.

2.1.6. Fuse-holders: suitable without adaptors, for type and size of fuse indicated.

2.1.7. Quick-make, quick-break action.

2.1.8. ON-OFF switch position indication on switch enclosure cover.

2.2. EQUIPMENT IDENTIFICATION

- 2.2.1. Provide equipment identification in accordance with Section 26 05 53.00 – IDENTIFICATION.
- 2.2.2. Indicate name of load controlled on nameplate.
- 2.2.3. Provide a Lamacoid nameplate that indicates the replacement fuse size as well as the maximum allowable fuse size for that disconnect based upon the sizing of the feeder.

2.3. MANUFACTURERS

- 2.3.1. The following are acceptable manufacturers:
  - .1 Schneider Electric.
  - .2 Eaton Cutler-Hammer.
  - .3 Siemens.
  - .4 ABB.

3. Execution

3.1. INSTALLATION

- 3.1.1. Install disconnect switches complete with fuses if applicable.

END OF SECTION

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26 51 13.00 Lighting Equipment

1. General

1.1. WORK INCLUDED

- 1.1.1. Section 26 01 00.00 – OPERATING AND MAINTENANCE INSTRUCTIONS.
- 1.1.2. Section 26 05 01.00 – GENERAL INSTRUCTIONS FOR ELECTRICAL SECTIONS.
- 1.1.3. Section 26 05 04.00 – SUBMITTALS – SHOP DRAWINGS.
- 1.1.4. Section 26 05 21.00 – WIRES AND CABLES UNDER 2000 V.
- 1.1.5. Section 26 06 05.16 – LUMINAIRE SCHEDULE.

1.2. REFERENCES

- 1.2.1. CSA C22.2 No. 74 – Equipment for Use with Electric Discharge Lamps, latest edition.
- 1.2.2. The Consortium of Energy Efficiency (CEE) guidelines, latest edition.
- 1.2.3. IESNA LM-79 – Approved Method: Electric and Photometric Measurements of Solid-State Lighting Products, latest edition.
- 1.2.4. IESNA LM-80 – Approved Method: Measuring Lumen Maintenance of LED Light Sources, latest edition.
- 1.2.5. The Certified Ballast Manufacturers Association (CBM) standards, latest edition.
- 1.2.6. NEMA 410 – Performance Testing for Lighting Controls and Switching Devices with Electronic Drivers and Discharge Ballasts, latest edition.
- 1.2.7. CSA C22.2 No. 141 – Emergency Lighting Equipment, latest edition.

1.3. SUBSTITUTION

- 1.3.1. The lighting equipment for this project and specified herein has been carefully selected for its ability to meet the project's luminous environment requirements. Manual and computer calculations have been performed to ensure that the lighting equipment that has been specified complies with established criteria. The Engineer's Representative reserves the right not to accept any alternates or substitutions in accordance with the requirements of the Luminaire Schedule. If alternates or substitutions are entertained, then it is the responsibility of the Contractor/Supplier to provide: a comparison table showing the specified and the proposed luminaire performance information, IES files for the proposed luminaires, the information required herein, and detailed layouts and lighting calculations demonstrating that the performance of the alternate luminaire meets or exceeds the original lighting design while not consuming any additional energy. An extra review fee, per luminaire submitted, will be charged to the Contractor (with no additional costs to the Project Owner). Reviewed alternates may be rejected, regardless of the payment fee received, when alternates do not meet the project requirements. Invoices must be paid prior to Consultant's review starting or changes in the design documents to incorporate the proposed alternates after their review. The Contractor/Supplier is responsible to ensure the light levels provided in the alternate submittal package will achieve the design light levels. Where the light levels are not achieved, the Contractor is responsible to replace the luminaire with a luminaire that will meet the required levels with no increase in energy use at no cost to the Owner. Rather than replacing the luminaires, the Engineer's Representative may accept the installation of additional luminaires by the Contractor at no cost to the Owner in order to achieve the required light levels.

- 1.3.2. Accompanying the request for a luminaire or lamp substitution, the contractor shall submit a complete lighting calculation report with photometric modeling of the space showing light levels including average, maximum, minimum and max to min values.
- 1.4. SHOP DRAWING AND PRODUCT DATA
- 1.4.1. Submit Shop Drawings and product data in accordance with Section 26 05 04.00 – SUBMITTALS/SHOP DRAWINGS.
- 1.4.2. Submit a Shop Drawing for each luminaire specified, including lamp.
- 1.4.3. Luminaire submittals are to consist of a physical description, manufacturer's specification sheets, dimensioned drawings, and complete photometric data from an independent test laboratory in the form of IES computer files of the equipment being submitted and hard copy of the photometric report. Coordinate ceiling types to ensure proper supports and luminaire framing.
- 1.4.4. Lamp submittals are to consist of manufacturer's technical data with respective luminaire shop drawing. Submittal to include operating wattage, rated life, colour temperature, base type, lamp shape, CRI, and voltage.
- 1.4.5. LED submittals are to consist of manufacturer's technical data for diodes and drivers with respective luminaire shop drawing. Submittal to include operating wattage, voltage, maximum distance from drivers, wiring diagrams and lumen output at time of delivery.
- 1.4.6. Ballast submittals are to consist of manufacturer's technical data with respective luminaire shop drawing. Submittal to include operating wattage, input voltage, ballast efficiency, maximum distance for remote ballasts, power factor, and operating temperature.
- 1.4.7. Where samples are indicated on the luminaire schedule, they are to be provided with shop drawings at time of shop drawing submittals unless noted otherwise.
- 1.4.8. Where luminaires consist of multiple field assembled components, include manufacturer supplied installation manual detailing the assembly procedure.
- 1.5. OPERATION AND MAINTENANCE DATA
- 1.5.1. Provide operation and maintenance data for lighting equipment in accordance with Section 26 01 00.00 – OPERATING AND MAINTENANCE INSTRUCTIONS for incorporation into the manual.
- 1.5.2. Operation and maintenance instructions shall include documentation related to warranty claim process.
- 1.6. FIXED PER UNIT COST LUMINAIRES
- 1.6.1. Listed in the luminaire schedule are a fixed per unit cost for certain luminaire types. Electrical Contractor is responsible for completing a take-off of the drawings to determine quantity of each luminaire type and use the listed fixed unit price to calculate the total cost per luminaire type. The total cost for all luminaires shall be carried in the bid for the electrical contract. Provide a breakdown of the total cost, per luminaire type, that is carried under the electrical contract. All luminaires are to be included in the electrical contract including all luminaires identified with fixed unit costs. The Electrical Contractor is to include fixed per unit cost luminaires in Light Fixtures – Materials in the standard progress draw breakdown defined in Section 26 05 01.00 – GENERAL INSTRUCTIONS FOR ELECTRICAL SECTIONS.
- 1.6.2. The fixed per unit cost excludes applicable taxes and includes lamps and distributor markups. Electrical Contractor is responsible to include in the base bid for delivery, scheduling, receiving, storage, partial assembly, installation, wiring, aiming, cleaning and warranties for all fixed per unit cost luminaires. Show the applicable taxes as a separate line item.

1.7. CASH ALLOWANCE LUMINAIRES

- 1.7.1. Listed in the luminaire schedule are 'cash allowance' fixtures for certain luminaire types. A complete take-off of the drawings has been done to determine the quantity of each 'cash allowance' luminaire type and the total cost has been carried in the Div-0/1 cash allowance value. The total cost for all 'cash allowance' luminaires are NOT to be carried in the bid for the electrical contract.
- 1.7.2. After tender award to the successful Electrical Contractor, the Consultant shall provide the Electrical Contractor the exact manufacturer/model number(s) of all 'cash allowance' luminaires and the Electrical Contractor shall be responsible for purchasing the fixtures through the monies from the cash allowance.
- 1.7.3. Provide a breakdown of the total cost, per luminaire type, that is carried under the base electrical contract. All luminaires are to be included in the base electrical contract excluding all luminaires identified as 'cash allowance' luminaires. However the Electrical Contractor is to include 'cash allowance' luminaires in Light Fixtures – Materials in the standard progress draw breakdown defined in Section 26 05 01.00 – GENERAL INSTRUCTIONS FOR ELECTRICAL SECTIONS once the Consultant provides the Electrical Contractor with the exact manufacturer/model number(s).
- 1.7.4. The cash allowance value carried excludes applicable taxes and includes lamps and distributor markups. Electrical Contractor is responsible to include in the base bid for delivery, scheduling, receiving, storage, partial assembly, installation, wiring, aiming, cleaning and warranties for all 'cash allowance' luminaires. Show the applicable taxes as a separate line item.

1.8. WARRANTY

- 1.8.1. The manufacturer shall provide a warranty against defects in material and workmanship, starting at Substantial Performance of the Work. Parts warranty shall be 5 years and labour warranty shall be 1 year.
- 1.8.2. LED's, Drivers, Lamps and ballasts showing signs of premature failure shall be replaced at no cost to the owner.
- 1.8.3. LED Drivers must have a 5 year warranty.

2. Product

2.1. GENERAL

- 2.1.1. Only utilize Products that are certified for use in Canada in accordance with the requirements of Section 2 of the Electrical Code and that have been tested by a Certification Body accredited by the Standards Council of Canada and acceptable to the Electrical Authority Having Jurisdiction for the approval of electrical equipment. Furthermore, ensure that Products utilized have been approved to a recognized Canadian Standard.

2.2. LAMPS AND LEDS

- 2.2.1. All Lamps are to meet the standards of the Consortium of Energy Efficiency (CEE) guidelines.
- 2.2.2. Refer to luminaire schedule for project specific details, and lamps required.
- 2.2.3. Lamps are to be in accordance with the lamp specifications detailed in the Luminaire Schedule and as noted below. Luminaire schedule shall take precedence where differences occur.

- 2.2.4. All lamps are to be new and are to be from the same manufacturing batch to avoid colour differences. Replace all lamps that exhibit colour shift, or exhibit premature lumen intensity decline, at no cost to the owner.
- 2.2.5. Light Emitting Diodes (LED)
- .1 LEDs shall meet the standards of IESNA LM-79 and LM-80.
  - .2 All LED drivers shall be tested and comply with the maximum in-rush current limits as stated in NEMA 410.
  - .3 LED's shall be manufactured by Cree, Osram, Nichia, Toshiba, Lumileds, Bridgelux, or Samsung. Colour temperature shall be as indicated on the luminaire schedule. Lamps are to be binned with no visible colour variance (+/- 100K from specified colour temperature). Rated life for 1 watt white LED shall be 50,000 hours. Lumen output to be maximum based on latest technology at time of delivery.
  - .4 All LED luminaires that present signs of failure on site, within the warranty period, must be replaced at no cost to the owner. If temporary luminaires are required to replace any failed LED luminaires, during the waiting time for parts (i.e. drivers, boards, heat sinks, etc.), the labour cost including installation, temporary luminaire supply, temporary luminaire removal and reinstallation of the LED luminaire must be provided at no cost of the owner. Additional electrical costs, associated with higher Wattage temporary luminaires, must be reimbursed with interest to the owner by the manufacturer.
  - .5 In case of failure of an LED luminaire, complete or part thereof, an independent third party testing Laboratory (approved by Smith + Andersen) shall be commissioned by the manufacturer or vendor to perform tests on samples taken from the failed luminaires installed on corresponding site. All reporting including the test results must be submitted to Smith + Andersen for evaluation and final approval.
  - .6 Any additional time involved by Smith + Andersen will be billed at our hourly rates to the manufacturer or vendor.
- 2.3. DRIVERS
- 2.3.1. All drivers are to be tested and comply with maximum in-rush current limits within NEMA 410 standards. This is to be clearly indicated on shop drawing submittal.
- 2.3.2. LED dimming shall be equal in range and quality to a commercial grade incandescent dimmer. Quality of dimming to be defined by dimming range, freedom from perceived flicker or visible stroboscopic flicker, smooth and continuous change in level (no visible steps in transitions), natural square law response to control input, and stable when input voltage conditions fluctuate over what is typically experience in a commercial environment. Demonstration of this compliance to dimming performance will be necessary for substitutions or prior approval.
- 2.3.3. Ten-year expected life while operating at maximum case temperature and 90 percent non-condensing relative humidity.
- 2.3.4. Withstand up to a 1,000 volt surge without impairment of performance as defined by ANSI C62.41 Category A.
- 2.3.5. No visible change in light output with a variation of plus/minus 10 percent line voltage input.
- 2.3.6. Total Harmonic Distortion less than 20 % percent and meet ANSI C82.11 maximum allowable THD requirements at full output. THD shall at no point in the dimming curve allow imbalance current to exceed full output THD.
- 2.3.7. Driver must support automatic adaptation, allowing for future luminaire upgrades and enhancements and deliver improved performance:
- .1 Adjustment of forward LED voltage, supporting 3 V through 55 V.

- .2 Adjustment of LED current from 200 mA to 1.05 A at the 100 percent control input point in increments of 1 mA.
  - .3 Adjustment for operating hours to maintain constant lumens (within 5 percent) over the 50,000 hour design life of the system, and deliver up to 20 percent energy savings early in the life cycle.
- 2.3.8. Driver must be able to operate for a (+/- 10%) supply voltage of 120 V through 277 VAC at 60 Hz.
- 2.3.9. Driver must be UL Recognized under the component program and shall be modular for simple field replacement. Drivers that are not UL Recognized or not suited for field replacement will not be considered.
- 2.3.10. Driver shall include ability to provide no light output when the analog control signal drops below 0.5 V, or the DALI/DMX digital signal calls for light to be extinguished and shall consume 0.5 watts or less in this standby. Control deadband between 0.5 V and 0.65 V shall be included to allow for voltage variation of incoming signal without causing noticeable variation in fixture to fixture output.
- 2.3.11. Over the entire range of available drive currents, driver shall provide step-free, continuous dimming to black from 100 percent to 0.1 percent and 0 % relative light output, or 100 – 1 % light output and step to 0 % where indicated. Driver shall respond similarly when raising from 0 % to 100 %
- .1 Driver must be capable of 20 bit dimming resolution for white light LED drivers or 15 bit resolution for RGBW LED drivers.
- 2.3.12. Driver must be capable of configuring a linear or logarithmic dimming curve, allowing fine grained resolution at low light levels
- 2.3.13. Drivers to track evenly across multiple fixtures at all light levels, and shall have an input signal to output light level that allows smooth adjustment over the entire dimming range.
- 2.3.14. Driver and luminaire electronics shall deliver illumination that is free from objectionable flicker as measured by flicker index (ANSI/IES RP-16-10). At all points within the dimming range from 100-0.1 percent luminaire shall have:
- .1 LED dimming driver shall provide continuous step-free, flicker free dimming similar to incandescent source.
  - .2 Base specification: Flicker index shall less than 5% at all frequencies below 1000 Hz.
  - .3 Preferred specification: Flicker index shall be equal to incandescent, less than 1% at all frequencies below 1000 Hz.
- 2.3.15. Control Input
- .1 4-Wire (0-10V DC Voltage Controlled) Dimming Drivers
    - .1 Must meet IEC 60929 Annex E for General White Lighting LED drivers
    - .2 Connect to devices compatible with 0 to 10 V Analog Control Protocol, Class 2, capable of sinking 0.6 mA per driver at a low end of 0.3 V. Limit the number of drivers on each 0-10 V control output based on voltage drop and control capacity.
- 2.3.16. Must meet ESTA E1.3 for RGBW LED drivers
- 2.3.17. Provide drivers manufactured by Cree, Osram, Nichia, Toshiba, Lumileds, Bridgelux, Samsung, or Eldoleds.

## 2.4. LUMINAIRES

- 2.4.1. All luminaires are to be complete with mounting brackets, transformers, supports, trims, louvers, lenses and other accessories as required to make luminaire operational and allow it to be installed in the respective location.
- 2.4.2. Luminaires shall be suitable for the environment where installed, include seals and gaskets, and corrosion resistant baked-on finish as required and as specified.
- 2.4.3. Louvers, lenses and diffusers must be of suitable thickness to prevent sagging.
- 2.4.4. Where drawings show luminaires mounted end-to-end, luminaires shall be suitable for continuous, seamless and tandem mounting.
- 2.4.5. All poles are to come complete with internal vibration dampeners to accommodate wind conditions to avoid damage due to wind-induced vibrations.
- 2.4.6. Where cameras are shown to be installed on poles, the poles shall be stiffened to reduce vibration and sway, and shall be rated for video recording cameras.
- 2.4.7. The supply and installation of fixed per unit cost and 'cash allowance' luminaires shall comply with all standards set forth in Electrical Specifications. Electrical Contractor is responsible to include in the base bid for delivery, scheduling, receiving, storage, partial assembly, installation, wiring, aiming, cleaning and warranties for all fixed per unit cost and 'cash allowance' luminaires.
- 2.4.8. Provide exit signs that comply with building code requirements, including CSA C22.2 No. 141.
- 2.4.9. The following is a list of generic type designation for luminaires. The project specific luminaire schedule is to be referenced for the specific types and designations and the respective specifications.
  - .1 Designations beginning with the letter 'L' denote LED type.
  - .2 Designations beginning with the letter 'X' denote exit sign.

## 3. Execution

### 3.1. INSTALLATION

- 3.1.1. It is the responsibility of the contractor to obtain the information related to the luminaire and luminaire trim finishes/colours from the Interior Designer or Architects prior to the fabrication of luminaires. The Contractor shall provide adequate time for the design team to review and comment on luminaire and luminaire trim finishes.
- 3.1.2. The contractor will provide, receive, unload, uncrate, store, protect and install lamps, luminaires, and other related lighting equipment as specified herein. Lamps for all equipment will be provided and installed by the contractor according to equipment manufacturer's instructions.
- 3.1.3. Locate luminaires in accordance with the Architect's Drawings. Coordinate exact locations on site. Refer to Architect's drawings for dimensions of coves and valences.
- 3.1.4. Install in accordance with Manufacturer's Instructions, Local Codes, Electrical Division Drawings and Specifications.
- 3.1.5. All suspended luminaires shall have cables and support stems vertically aligned.
- 3.1.6. Suspend luminaires in mechanical rooms after all the mechanical equipment and ductwork are installed. Luminaires are not to be suspended from mechanical pipes, ductwork or other building services.

- 3.1.7. All luminaires shall be installed underneath other services located within ceiling space. Contractor is responsible for interference drawings to ensure all services in ceiling are coordinated.
- 3.1.8. Any dimensions provided in the drawings or schedules are intended as general guidelines. For exact dimensioning refer to the Architectural drawings. The detailed information shall be cross referenced with the electrical specifications and the Luminaire Schedule applying the most stringent requirement.
- 3.1.9. It is the responsibility of the Electrical Contractor to coordinate luminaire trims and mounting system with ceiling finishes. Luminaires delivered on site with the wrong ceiling mounting system shall be replaced without additional costs for the owner. Restocking fees will not be accepted.
- 3.1.10. For suspended ceiling installations support luminaires from structural slab in accordance with local inspection requirements.
- 3.1.11. Where luminaires are mounted in tandem, align luminaires mounted in continuous rows to form straight uninterrupted line.
- 3.1.12. Align luminaires mounted individually parallel or perpendicular to building grid lines.
- 3.1.13. Ensure light leakage does not occur from openings and trim rings. Contractor is responsible to repair the ceiling at no cost to the Owner if cut-out is too large.
- 3.1.14. Connect luminaires to lighting circuits.
- 3.1.15. Provide all wiring in conduit with junction boxes on a grid pattern to limit the run of flexible armoured cable drops from the ceiling mounted junction box to each luminaire to a maximum of 3 m in length unless approved otherwise in writing from the Engineer's Representative.
- 3.1.16. Modular wiring systems shall be employed only where indicated or with approval of the Engineer's Representative.
- 3.1.17. Luminaires are not to be used as temporary construction lighting. After being tested to ensure acceptable operation, luminaires will not be used until Substantial Performance of the Work unless permission is received from the owner, architect or Engineer's Representative.
- 3.1.18. Lamps are to be installed after luminaire is cleaned.
- 3.1.19. Clean all luminaires, inside and out at time of Substantial Performance of the Work. Replace all scratched or damaged luminaires, lenses, louvers and diffusers at no cost to the owner.
- 3.1.20. Installation of exit signs
- .1 Rough-in and installation of exit signs shall be carefully coordinated on site such that after installation of all equipment/services, including equipment/services from other trades (i.e. sprinkler lines, plumbing pipes, way-finding signs, etc.), shall not interfere with the line-of-sight visibility of the exit sign(s) from approach of the intended egress pathway(s).
  - .2 If exit sign(s) have been installed and do not meet the satisfaction of the Engineer's Representative/Architect, the Contractor shall lower, raise or relocate the exit sign(s) such that proper and adequate visibility of the exit sign(s) is achieved at no additional cost to the Owner.

END OF SECTION

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26 52 01.00 Unit Equipment for Emergency Lighting

1. General

1.1. WORK INCLUDED

1.1.1. Section 26 05 01.00 – GENERAL INSTRUCTIONS FOR ELECTRICAL SECTIONS.

1.1.2. Section 26 05 04.00 – SUBMITTALS/SHOP DRAWINGS.

1.1.3. Section 26 05 21.00 – WIRES AND CABLES UNDER 2000 V.

1.1.4. Section 26 05 34.00 – CONDUITS, CONDUIT FASTENERS AND FITTINGS.

1.2. REFERENCES

1.2.1. CSA Standard C22.2 No.141 – Emergency Lighting Equipment, latest edition.

1.3. SHOP DRAWINGS AND PRODUCT DATA

1.3.1. Submit Shop Drawings and product data in accordance with Section 26 05 04.00 – SUBMITTALS/SHOP DRAWINGS.

1.3.2. Submit Shop Drawings for equipment and accessories specified in this Section. Include photometric data for all luminaires not named as approved in this specification.

1.3.3. Data to indicate system components, mounting method, source of power and special attachments.

1.3.4. Manufacturer/Contractor to ensure runtime capacity of battery unit is sized accordingly to meet the runtimes specified within this section and/or drawings/schedules.

1.4. WARRANTY

1.4.1. For batteries, the warranty period shall be extended to 120 months from Substantial Performance of the Work, with a no-charge replacement during the first 5 years and a pro-rata charge on the second 5 years.

2. Products

2.1. EQUIPMENT

2.1.1. Supply voltage: 120 V, ac.

2.1.2. Output voltage: 24 V dc.

2.1.3. Operating time: 120 minutes, unless otherwise noted in schedules.

2.1.4. Battery: 10 year sealed, valve regulated, lead calcium.

2.1.5. Charger: solid state, multi-rate, voltage/current regulated, inverse temperature compensated, short circuit protected with regulated output of plus or minus 0.01 V for plus or minus 10 % input variations. Recharges battery within 24 hours in accordance with CSA.

2.1.6. Solid state transfer circuit.

2.1.7. Low voltage disconnect: solid state, modular, operates at 80 % battery output voltage.

2.1.8. Signal lights: solid state, for 'AC Power ON' and 'High Charge'.

- 2.1.9. Lamp heads: integral on unit and remote as indicated, 345 horizontal and 180 vertical adjustment. Lamp type: LED MR16, wattage to be 6 W unless noted otherwise on drawings or in the "Battery Unit Schedule."
- 2.1.10. Directional remote head lamps to have narrow beam spread distribution.
- 2.1.11. Recessed remote head lamps to have flood beam spread distribution.
- 2.1.12. Cabinet: suitable for direct or shelf mounting to wall and c/w knockouts for conduit. Removable or hinged front panel for easy access to batteries.
- 2.1.13. Finish: Baked white enamel.
- 2.1.14. Auxiliary equipment:
  - .1 Ammeter.
  - .2 Voltmeter.
  - .3 Test switch.
  - .4 Time delay relay.
  - .5 Battery disconnect device.
  - .6 Ac input and dc output terminal blocks inside cabinet.
  - .7 Bracket.
  - .8 Cord and single twist-lock plug connection for ac.
  - .9 RFI suppressors.
  
- 2.2. WIRING OF REMOTE HEADS AND EXIT SIGNS
  - 2.2.1. Conduit: As per Section 26 05 34.00 – CONDUITS, CONDUIT FASTENERS AND FITTINGS.
  - 2.2.2. Conductors: As per Section 26 05 21.00 – WIRES AND CABLES UNDER 2000 V, sized as per manufacturer's recommendation and compliant to the applicable electrical codes.
  
- 3. Execution
  - 3.1. INSTALLATION
    - 3.1.1. Install unit equipment and remote mounted fixtures. Interconnect all heads with central battery pack.
    - 3.1.2. Direct heads to optimize illumination of egress pathways to minimum building code requirements.
    - 3.1.3. Connect exit lights to unit equipment.
    - 3.1.4. Contractor is to include the supply and installation of one additional head or an additional 5% of the total number of heads shown on the drawings, whichever is greater in the bid price. The installation is to include all wiring and conduit required to install the heads. If the heads are not installed during construction then the spare heads are to be turned over to the Owner at the end of the project.
  - 3.2. TESTING AND COMMISSIONING
    - 3.2.1. Contractor shall commission and test the entire system and adjust as necessary.
    - 3.2.2. Trip breaker(s) feeding battery unit(s) to simulate power failure to building. Test the operation of each unit to document the duration of runtime. Testing shall be performed during non-daylight hours.

- 3.2.3. Inform Engineer's Representative 10 days in advance prior to testing being performed in order for Engineer's Representative to make arrangements to witness testing of emergency lighting system.
- 3.2.4. Provide Engineer's Representative with signed test report by Contractor that each unit successfully operated for the required duration of time.
- 3.2.5. Re-test voltage of battery units 24 hours after initial testing to verify rated nominal voltage of unit. If battery unit has not recharged properly, replace unit and re-test as stated above at no additional cost to Owner.

END OF SECTION

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26 52 01.01 Emergency Lighting - Inverter

1. General

1.1. WORK INCLUDED

- 1.1.1. Section 26 05 01.00 – GENERAL INSTRUCTIONS FOR ELECTRICAL SECTIONS.
- 1.1.2. Section 26 05 04.00 – SUBMITTALS/SHOP DRAWINGS.
- 1.1.3. Section 26 08 01.00 – TECHNICAL SERVICES DIVISION STARTUP SERVICE.

1.2. REFERENCES

- 1.2.1. CSA C22.2 No.141 – Emergency lighting equipment, latest edition.
- 1.2.2. CSA or cUL listed for Canadian application, UL and ETL listed to UL924 – AC inverter system for emergency power supply, latest edition.
- 1.2.3. CSA or cUL listed to CSA C22.2 No.107.1 – Power Conversion Equipment, latest edition; ANSI C62.41; ANSI C62.45 (Cat. A&B), latest edition.
- 1.2.4. FCC Rules and Regulations 47 Part 15, Subpart J, Class A - Certified Compliance, latest edition.
- 1.2.5. Systems comply with Electrical Code and Building Code, latest edition.
- 1.2.6. UL 1778 – Standard for Uninterruptable Power Supply Equipment, latest edition.
- 1.2.7. ANSI C62.41 – Recommended Practice on Surge Voltages in Low Voltage Power Circuits, latest edition.
- 1.2.8. NEMA PE1 – Uninterruptible power supply, latest edition.
- 1.2.9. NFPA 111 – National Fire Protection Agency, latest edition.

1.3. SHOP DRAWINGS AND PRODUCT DATA

- 1.3.1. Submit Shop Drawings and product data in accordance with Section 26 05 04.00 – SUBMITTALS/SHOP DRAWINGS
- 1.3.2. Submit shop drawings for equipment and accessories specified in this Section. Include photometric data for all luminaires not named as approved in this specification.
- 1.3.3. Data to indicate system components, mounting method, source of power and special attachments.
- 1.3.4. Manufacturer/Contractor to ensure runtime capacity of battery unit is sized accordingly to meet the runtimes specified within this section and/or Drawings/Schedules.

1.4. QUALITY ASSURANCE

- 1.4.1. The Emergency Lighting Inverter (ELI) module shall be “burned-in” without failure for a minimum of 24 hours.
- 1.4.2. A final test procedure for the product shall include a check of performance specifications before and after the twenty-four hour “burn-in.”
- 1.4.3. An on-site test procedure shall include a check of controls, functions and indicators after installation of the equipment.

1.5. FIELD QUALITY CONTROL

- 1.5.1. Factory-trained field service personnel shall perform the following inspections and test procedures during the ELI start-up.
- 1.5.2. Visual inspection
- 1.5.3. Mechanical inspection
- 1.5.4. Electrical inspection
- 1.5.5. Functional inspection
- 1.5.6. After installation of equipment, a signed commissioning report describing on-site testing and functionality shall be sent to the factory to validate warranty.

1.6. WARRANTY

- 1.6.1. The warranty of the equipment shall be twelve (12) months from Substantial Performance of the Work.
- 1.6.2. For batteries, the warranty period shall be extended to 120 months from Substantial Performance of the Work., with a no-charge replacement during the first 5 years and a pro-rated charge on the second 5 years.

2. Products

2.1. SYSTEM DESCRIPTION

- 2.1.1. Provide a complete Emergency Lighting Inverter (ELI) as specified herein to provide continuous, regulated ac power to various emergency lighting fixtures under normal and abnormal conditions, as well as loss of the utility ac power. This system shall incorporate conditioning and power filters on both the input and output sides of the ELI.

- 2.1.2. ELI Module Components: The ELI module consists of the following major components:

- .1 Input ac filter
- .2 Output ac filter
- .3 Full galvanic output isolation transformers
- .4 Inverter
- .5 Rectifier/Charger
- .6 Power factor correction (PFC) circuit
- .7 Dc to dc converter
- .8 Emergency power off (EPO) interface
- .9 Input, rectifier, and reserve circuit breakers
- .10 Internal Maintenance bypass
- .11 Static bypass switch
- .12 Microprocessor controlled logic and control panel with alarm indicators and digital metering display
- .13 Communications interface:
  - .1 RS-232
  - .2 RS-485
  - .3 Ethernet

- .4 8 port relay
- .14 Input power walk-in
- .15 Front cable entry
- .16 External battery connection
- .17 Battery Cabinet Component
  - .1 Sealed, maintenance free batteries
  - .2 Battery circuit breaker
- .18 Optional features:
  - .1 Remote terminal strip
- .19 All lugs and terminals to be dual rated for Copper/Aluminum (Cu/Al).

### 2.1.3. Definitions

- .1 ELI Module: The portion of the ELI system that contains the rectifier/charger, inverter, static bypass switch, manual bypass switch, controls, monitoring, isolation transformer and indicators.
- .2 Rectifier/Charger: The portion of the ELI module, which converts the normal source AC input power to DC power for the inverter input and for charging the battery.
- .3 Inverter: The portion of the ELI module that converts DC power from either the rectifier/charger or the battery, to regulated and filtered AC power, which is supplied to the critical load.
- .4 Static Bypass Switch: The portion of the ELI module which automatically transfers the critical loads, without interruption, from the inverter output to the bypass AC power source in the event of an overload or degradation of the inverter's performance.
- .5 Manual Bypass Switch: The portion of the ELI module, which is used to connect the utility AC power source to the critical loads while maintaining galvanic isolation.
- .6 Battery: The battery system that provides DC power to the inverter input when the normal AC input power to the ELI module fails or in the event that the rectifier/charger should fail.
- .7 Critical Loads: Those loads that require regulated continuous AC power and which are connected to the output of the ELI module.

## 2.2. SYSTEM OPERATION

- 2.2.1. Normal: the inverter shall supply ac power continuously to the critical loads. The inverter output shall be synchronized with the bypass ac power source provided that the bypass ac power source is within the specified frequency range. The PFC circuit shall convert the normal ac input power to dc power for the inverter in conjunction with the charger to maintain the battery charge.
- 2.2.2. Loss of normal ac input power: the battery shall supply dc power, via the dc to dc converter, to the inverter so that there is no interruption of ac power to the critical loads whenever the normal ac input power source of the ELI module deviates from the specified tolerances or fails completely. The battery shall continue to supply power to the inverter for the specified protection time.
- 2.2.3. Return of normal ac input power source: the PFC circuit shall perform a walk-in start and assume the dc load from the battery when the normal ac input power source returns. The charger shall then simultaneously supply the inverter with dc power and recharge the battery. This shall be an automatic function and shall cause no disturbance to the critical load.

- 2.2.4. Transfer to bypass ac power source: if the control circuitry senses an overload, an inverter shutdown signal, a dc bus fault or degradation of the inverter output, then it shall automatically transfer the critical loads from the inverter output to the bypass ac power source without an interruption of power. If the bypass ac power source is above or below normal voltage limits, then the transfer shall be inhibited.
- 2.2.5. Transfer back to inverter: the static bypass switch shall be capable of automatically transferring the load back to the inverter after the inverter has returned to normal conditions. Retransfer shall not occur if the two sources are not synchronized. The static bypass control circuit shall have the ability to lock the critical load to either the inverter output or the bypass source (selectable). This lockout condition shall be reset under manual command.
- 2.2.6. ELI without battery: if the battery is taken out of service for maintenance, it shall be disconnected from the rectifier/charger and inverter. The ELI shall continue to function and meet the performance criteria specified herein except for the battery reserve time and step load performance.

### 2.3. ELECTRICAL CHARACTERISTICS

#### 2.3.1. ELI Module Input

- .1 Voltage and number of input wires: as shown on electrical single line diagram
- .2 Voltage range: -20 % to +15 % without discharging the battery
- .3 Input frequency: 45 to 65 Hz continuous
- .4 Reserve frequency: 60 Hz  $\pm$  7% continuous
- .5 Current walk-in: 20 seconds to full load rating
- .6 Maximum input current: 150 % of nominal full load current
- .7 Power factor: 0.60 lagging at nominal input voltage, 30 % THD at nominal conditions and at full ELI load.
- .8 Current harmonics: <9 % THD, with 12 pulse rectifier and input factor
- .9 Input transient protection: ANSI C62.41.

#### 2.3.2. ELI Module Output

- .1 Voltage and number of output wires: as shown on electrical single line diagram
- .2 Frequency: 60 Hz
- .3 Power rating: as shown on electrical single line diagram
- .4 Battery back-up time: 90 minutes unless otherwise noted
- .5 Voltage regulation:  $\pm$ 2 % of nominal for any of the combined effects
  - .1 No load to full load
  - .2 Minimum to maximum output power factor
  - .3 Minimum to maximum ac input voltage
  - .4 Minimum to maximum dc input voltage
  - .5 0 to 40 °C ambient temperature
- .6 Dynamic regulation:
  - .1  $\pm$  3 % from nominal for 100 % step load
  - .2  $\pm$ 2 % from nominal for 50 % step load
  - .3 Recovering to within 1 % in less than one cycle
- .7 Voltage unbalance:  $\pm$  3 % of nominal for 100 % unbalanced loads
- .8 Phase separation:

- .1  $120^\circ \pm 1\%$  of nominal for 100 % balanced loads
- .2  $120^\circ \pm 2\%$  of nominal for 100 % unbalanced loads
- .9 Voltage distortion
  - .1 <2 % THD at 100 % loads (linear load)
  - .2 <3 % THD at 100 % load (non-linear load)
- .10 Frequency stability: 60 Hz  $\pm$  0.01 % free running
- .11 Phase-lock window: 60 Hz,  $\pm$  4 %
- .12 Overload capability:
  - .1 Inverter:
    - .1 < 110 % continuous
    - .2 125 % for 15 minutes
    - .3 150 % for 10 seconds
  - .2 Static bypass:
    - .1 200 % for 30 seconds
    - .2 400 % for 1 second
- .13 Fault clearing capability:
  - .1 Static bypass: 1000 % for  $\frac{1}{2}$  cycle (non-repetitive)
- .14 Crest factor: 3:1 maximum

### 2.3.3. Battery

- .1 Type: Sealed lead-acid (maintenance-free AGM)
- .2 Number of Cells: 174 Cells
- .3 Voltage range: 295 – 410 VDC
- .4 Float voltage: 396 VDC
- .5 Min. discharge voltage: 295 VDC
- .6 20 year life type battery

### 2.3.4. Power Factor Correction Circuit

- .1 The PFC circuit shall consist of an input breaker, an input EMI/transient suppressor network, output filter power factor correction circuit and a solid-state rectifier with control circuitry to provide constant voltage/constant current regulation and a current walk-in on start-up. The PFC circuit shall be a full wave high frequency controlled type using SCRs in both the positive and negative legs.
- .2 Over-current/Transient protection: The input of the PFC circuit shall be protected from noise and transients by an input EMI/transient suppressor network. The PFC circuit shall be electronically regulated and current limited to protect the connections to the inverter input and to prevent damage to the charger.
- .3 Control circuitry: The PFC circuit shall be equipped with Digital Signal Processor (DSP) control circuitry to provide constant DC voltage regulation of  $\pm 1\%$  for +15 % to -20 % ac input voltage change, for 45 to 65 Hz input frequency change, or for 0 % to 100 % load variations.  
The control circuitry shall enable continuous PFC circuit operation from an engine generator with output frequency transients of up to 5 Hz.
- .4 Whenever ac power is applied to the PFC circuit, the current limiting control circuitry shall walk-in over a period of at least 20 seconds to allow gradual loading of the normal input ac power source.

- .5 The control circuitry shall automatically turn off the PFC circuit without opening circuit breakers if any of the following conditions occur:
  - .1 High dc voltage
  - .2 Ac over-voltage of 120 % of normal ac input
  - .3 Loss of normal ac input
  - .4 Loss of a phase on normal circuit
  - .5 The control circuitry shall be capable of additional PFC circuit features with future DSP control software releases.
- .6 Output filter: The PFC circuit shall be furnished with output filtering to limit output ripple voltage to 0.5 % for 0 to 100 % load.
- .7 Capacity: The PFC circuit shall have sufficient capacity to supply the inverter at 100 %, 0.8 PF load plus recharge the battery bank to 90 % of full capacity within 24 hours.

### 2.3.5. Inverter

- .1 The inverter shall utilize fast-switching IGBT transistors, pulse width modulation (PWM) and phase vector synchronization (PVS). It shall consist of a switching bridge, dc input, output filter and control circuitry to provide precise ac voltage regulation, harmonic cancellation//conditioning and superior transient response.
- .2 Control circuitry:
  - .1 The inverter shall be provided with a digital signal processor (DSP) control circuitry to provide constant ac voltage regulation and transient response as specified. The high-speed DSP controls shall sample the output continuously to provide precise voltage control.
  - .2 The high speed DSP control shall sample the inverter output and the ELI module output to determine the phase and amplitude of the output voltage. The results shall be used by the DSP to control the inverter output to ensure a clean output ac voltage sine wave when driving non-linear loads.
  - .3 The circuitry shall provide low voltage initial start-up of the inverter and ramp-up to full voltage.
  - .4 The control circuitry shall automatically synchronize and phase lock the inverter output to the bypass ac power source as long as the bypass source is within the synchronization range. If the bypass ac power source is not within these pre-set limits, then the control circuitry shall break synchronization and lock to an internal crystal oscillator.
  - .5 The control circuitry shall automatically send a signal to the static bypass switch to transfer to the bypass ac source and then turn off the inverter for any of the following conditions:
    - .1 Blown inverter fuse
    - .2 Over-temperature
    - .3 Overloads per specified limits
    - .4 High/low dc voltage
    - .5 Inverter over-voltage or under-voltage condition
  - .6 The control circuitry shall automatically turn off the inverter when the battery reaches the end of discharge. The ELI shall automatically restart and return to normal when input ac power returns.
  - .7 The control circuitry shall be capable of additional inverter features with future DSP control software releases.

2.3.6. Static Bypass Switch

- .1 The static bypass shall consist of two pairs of Silicon Controlled Rectifiers (SCR's) per phase with each pair connected in inverse parallel. The static bypass shall be connected between the bypass (input) AC power source and the output transformer. Static bypass and inverter shall be isolated from one another.
- .2 Inverter Failure: If the inverter is out of normal limits due to under voltage or over voltage, or is shut down for any reason, the static bypass switch shall turn on to provide power to the load from the bypass AC power source without interruption.
- .3 Retransfer to Inverter: The static bypass switch shall be capable of automatically retransferring the load back to the inverter after the inverter has returned to normal conditions and stabilized for a pre-set period of time.
- .4 Overload: If an inverter overload is detected, the static bypass switch shall operate as described in 2.5.1 and .2 above. A transfer shall not occur unless the inverter overload ratings and time duration described in paragraph 2.1.2.m) are exceeded.
- .5 Over-current Protection
  - .1 Input over current protection shall be provided internal to the ELI rated at no less than 125 % of ELI rating.
  - .2 The static bypass switch shall be rated to carry 200 % of the ELI's rated output current for thirty seconds and 1000 % of the ELI's rated output current for one half cycle.
- .6 Transfer Conditions
  - .1 The static bypass switch shall transfer the critical load from the output of the inverter to the bypass AC power source for the following conditions:
    - .1 Inverter voltage less than 95 % of nominal.
    - .2 Inverter voltage greater than 105 % of nominal.
    - .3 Inverter overload period expired.
    - .4 Inverter shutdown for any reason.
  - .2 The static bypass switch shall inhibit transfer to the bypass AC power source for the following conditions:
    - .1 Bypass AC power source voltage less than 80 % of nominal line to neutral.
    - .2 Bypass AC power source voltage greater than 120 % of nominal line to neutral.
    - .3 Inverter not phase-locked to the bypass AC source.
    - .4 Bypass AC power source frequency deviation greater than 7 % of nominal.
- .7 Automatic Retransfer Conditions: The system shall automatically retransfer the load to the inverter provided all of the following conditions are met:
  - .1 The inverter logic and the bypass AC power source are synchronized and in phase.
  - .2 Inverter conditions are normal.
  - .3 The ELI output is not overloaded.
- .8 Transfer Time: Maximum transfer time to switch from inverter to bypass AC power source shall be 100 microseconds.
- .9 Single Input Configuration: The rectifier and internal bypass systems (static bypass and manual bypass switch) shall be connected to the AC power source through a common set of terminals at the ELI input. This single input configuration shall enable the ELI

primary and bypass AC power sources to be provided from a single input feeder. This will simplify installation complexity and reduce installation costs.

2.3.7. Internal Manual Bypass Switch

- .1 The ELI shall incorporate an internal manual bypass switch. This switch shall provide provisions to allow the input ac power to bypass the electronics and supply the load without interruption of power to the loads. This switch shall not bypass the output isolation transformer or power filters to ensure minimal power problems on manual bypass mode.
- .2 The main CPU shall monitor the manual bypass breaker position. In the event of accidental operation of the breaker without the inverter being shutdown, the CPU will automatically shut down the inverter and trigger an alarm notification. As long as the manual bypass breaker remains in the "on" position inverter operation shall remain inhibited.

2.3.8. Front Panel and User Interface

- .1 The ELI front panel shall include the following LED's and an active mimic diagram of the ELI operation:
  - .1 Eight warning LED's
    - .1 Rect. AC Fail
    - .2 Res AC Fail
    - .3 Fuse/Temp
    - .4 Overload
    - .5 High DC
    - .6 Bat Low
    - .7 Bat Low Shutdown
    - .8 Fault
  - .2 Twenty-four operation LED's
    - .1 Inv On
    - .2 Inv Static Switch
    - .3 Short Circuit
    - .4 Fuse/Temp Shutdown
    - .5 Inv Fail Inverter Shutdown
    - .6 Bypass On Inverter Shutdown
    - .7 High DC Inverter Shutdown
    - .8 Overload Inverter Shutdown
    - .9 70 % Load
    - .10 110 % Load
    - .11 125 % Load
    - .12 150 % Load
    - .13 Res AC Fail
    - .14 Res AC Freq. Fail
    - .15 Bat Low
    - .16 Bat Low Shutdown
    - .17 Rect. AC Fail

- .18 Rotation Error
- .19 Rect. Shutdown
- .20 Rect. High DC
- .21 Boost Charge
- .22 Battery Test
- .23 Emergency Stop
- .24 Data Line
- .3 The front panel shall include the following buttons for system operation and control of the LCD display:
  - .1 System operation buttons:
    - .1 Inverter On
    - .2 Inverter Off
    - .3 Inverter Control
  - .2 LCD display control buttons:
    - .1 Up
    - .2 Down
    - .3 Enter
- .2 The ELI shall include an audible alarm-warning device. This alarm shall sound whenever any abnormal condition occurs. Any subsequent alarm shall cause reactivation of the status indicator and audible alarm.
- .3 The following parameters shall be measured and displayed by an alphanumeric LCD display on the Front Panel. Each display shall have the nomenclature of the parameter indicated with the associated value. AC voltage and current values shall be measured in true RMS units.
  - .1 Main Menu Display
    - .1 ELI identification
    - .2 Serial number
    - .3 Maximum output rating
    - .4 Input and output voltage configuration
    - .5 Current date and time
  - .2 Select Menu Display
    - .1 Access to further menus
  - .3 Status Warning Menu Display
    - .1 Current status of ELI operation
    - .2 Warning codes
    - .3 Fault codes
  - .4 Real Time Data Menu Display
    - .1 Allow access to further menu options
  - .5 Historical Event Menu Display
    - .1 Recorded events, warnings or faults
  - .6 Parameter Setting Menu Display
    - .1 Allows control of basic features

- .7 Rectifier Data Display:
  - .1 Input frequency.
  - .2 Rectifier AC voltage - phase to neutral.
- .8 Reserve Data Display
  - .1 Reserve frequency.
  - .2 Reserve AC voltage - phase to neutral.
- .9 Output Data Display
  - .1 Output frequency.
  - .2 Percent load per phase.
  - .3 Output voltage - phase to neutral.
- .10 Other Data Display
  - .1 Internal temperature.
  - .2 Battery voltage.
  - .3 Battery current with flow direction.
- .4 ELI event history shall be available through the alphanumeric display. The event history shall store a minimum of 77 previous status and alarm events with the date and time of each occurrence on an EEPROM. Allowances for a second EEPROM shall be made to allow for the stored recorded events to be increased to 154.

#### 2.3.9. Communication Interface

- .1 The ELI shall be equipped with eight (8) Form A (Normally Open) relay alarm contacts for remote signalling:
  - .1 Common (programmable OR gate for any combination of contacts)
  - .2 Battery Low
  - .3 Back-up Mode
  - .4 Manual Bypass Mode
  - .5 Static Bypass Mode
  - .6 Fault Condition
  - .7 Overload Condition
  - .8 Inverter On
- .2 The ELI shall be equipped with one Form A (Normally Open) summary alarm contact for remote fire alarm panel connection.
- .3 An input opto-coupled contact shall be included for remote shutdown of the ELI.
- .4 Remote alarm panel interface. Summary includes:
  - .1 Safety shutdown
  - .2 Low battery
  - .3 Bypass activated
  - .4 Output voltage not present
  - .5 Inverter stop activation

#### 2.3.10. Communication Ports

- .1 The ELI shall be equipped with:
  - .1 RS-232 port for SNMP (Ethernet Adapter)
  - .2 RS-485 port for computer communications

- .3 RS-485 port for remote display panel
- .2 SNMP (Simple Network Management Protocol) Ethernet Adapter shall be included as a standard feature. This adapter will allow for intranet and/or internet communication and monitoring of the ELI system. This adapter shall be password protected and accessible to authorized personnel only.
  - .1 The adapter shall allow the user to monitor the status of the ELI through a web page stored on the adapter from a remote station located on, or have access to the network the adapter is connected.
  - .2 The adapter shall be able to email, page or phone a user programmed number in the event of an emergency.
- 2.3.11. Construction
  - .1 Enclosure: The ELI electronics shall be housed in a CSA Type 1 with drip hood, sprinkler proof enclosure. The enclosure shall be primed and painted inside and outside with manufacturer's standard paint. The enclosure shall be a freestanding floor mount design. Enclosure shall incorporate integrated drip shield.
  - .2 Material and workmanship:
    - .1 Workmanship shall be first class in every respect.
    - .2 All material shall be new and of best industrial grade.
    - .3 Internal wiring conductors shall be combined into cables or bundles, and shall be tied securely together.
    - .4 All bundled wiring shall be identified by color codes or by wire numbers. Power cables shall be identified at each end.
- 2.3.12. Cooling
  - .1 The ELI shall be forced air-cooled. Ventilation shall be from the bottom to the top. The cooling shall be adequate for operation at altitudes up to 2,500 meters.
- 2.3.13. Audible Noise Reduction
  - .1 The ELI shall be designed and constructed such that the audible noise is reduced to a typical 38 to 40 decibels, measured on the A scale at 1 meter from the front of the cabinet.
- 2.3.14. Battery Cabinet
  - .1 The ELI shall be designed to operate with any common lead-acid or nickel-cadmium battery type. The installed battery type and rating shall be programmed into the ELI at the factory, and the ELI charger shall select the proper charging regimen based on the actual installed battery type. This will maximize the life of the battery. The ELI shall include a circuit breaker and battery test feature that will automatically test the battery every thirty (30) days. The user shall have the ability to manual test the battery as well.
- 2.3.15. Output Isolation Transformer
  - .1 The output shall be completely isolated from the input on all wires.
  - .2 The output neutral and ground wires shall be bonded on the output terminal strip.
  - .3 The transformer windings shall be vacuum impregnated to reduce audible noise and increase heat dissipation.
  - .4 The transformer shall have a cUL/UL recognized insulation system and shall be so located within the equipment to ensure that the hottest spot shall not exceed the rated insulation temperature and to ensure a low center of gravity.
- 2.3.16. Optional External Maintenance Bypass Cabinet

- .1 An external maintenance bypass cabinet shall be provided to allow the ELI system to be completely isolated and removed from the electrical system while the load is maintained through the external maintenance bypass. This optional cabinet shall provide make-before-break operation for transfers to and from the external maintenance bypass output. The following components shall be standard: input, ELI and bypass breakers, inter-cabinet wiring and mounting feet. Optional voltage matching transformers, isolation transformers and Kirk-Key interlock are to be offered.
- .2 Output Breakers
  - .1 Allows for loads to be disconnected for load maintenance, without UPS shutdown.

## 2.4. ACCEPTABLE MANUFACTURERS

- 2.4.1. BeLuce – Borealis or approved equal.

## 3. Execution

### 3.1. INSTALLATION

- 3.1.1. The equipment shall be installed in accordance with the manufacturer's recommendations as well as electrical code.
- 3.1.2. Install on flat floor only.
- 3.1.3. Tie-in general trouble and running alarms into fire alarm panel.
- 3.1.4. The inverter to be tested on site as defined in Section 26 08 01.00 – TECHNICAL SERVICES DIVISION STARTUP SERVICE and herein. Contractor to oversee all testing and correct any deficiencies noted.

### 3.2. TEST REPORTS

- 3.2.1. Submit all test reports as part of the O&M manuals.

### 3.3. MANUFACTURER'S FIELD SERVICE

#### 3.3.1. Service personnel

- .1 The ELI manufacturer shall employ a nationwide service organization, consisting of factory trained field service personnel dedicated to the start-up, maintenance, and repair of ELI and power equipment.

#### 3.3.2. Maintenance contracts

- .1 A full service maintenance contract for both the ELI system and battery system shall be available to the end user. Factory-trained service personnel shall perform all warranty and maintenance.

END OF SECTION

Attachment A Luminaire Schedule

# ATTACHMENT A

## LUMINAIRE SCHEDULE

END OF SECTION Attachment B Panel Schedules

LUMINAIRE SCHEDULE

Project Name: 26009.001 - ST. ANNE - KITCHENER  
 Project number: 26009.001

File Name: 26009.001 - Luminaire Schedule

Smith + Andersen



TYPE	VOLT.	LAMP(S)	DIMENSIONS	DESCRIPTION	DRIVERS/ POWER SUPPLY	MANUFACTURER/ CATALOGUE NUMBER	MINIMUM PERFORMANCE REQUIRED	LOCATED
<b>LED</b>								
FP1	120V	LED 4000K 80 CRI 45W	47.72" L x 23.7"W x 2.19"D	<b>2x4 Recessed fixture</b> , shallow fixture, T-bar ceiling, extruded aluminum with white enamel finish, acrylic diffuser, flat opal lens, estimated life 84,000 hours, 5 year limited warranty.	0-10V dimming	• Lithonia Lighting EPANL LED	4000lm (Corridors) or 4500lm	Refer to Floor Plans
SM1	120V	LED 4000K 80 CRI 34W (selectable)	47.7" L x 23.9" W x 2.6" H	<b>2x4 surface-mounted LED</b> , low-profile white steel housing with acrylic diffuser. Integral selectable lumen output and CCT. Suitable for hard ceiling applications.	0-10V dimming	• Lithonia Lighting CPANL LED (or approved equivalent)	4000lm (Corridors) or 4500lm	Refer to Floor Plans
LP2	120V	LED 4000K 80 CRI 105W	25.60" L x 15.51" W x 2.75" H	<b>Highbay Suspended LED Troffer:</b> Metal housing and reflectors, polyester powder finish for impact and corrosion resistance, frosted acrylic snap lens, 100,000 hours, medium distribution, 5 year limited warranty.  Fixture to be suspended from aircraft cable and approximately 1' below the joists and include wireguard accessory. Coordinate fixture mounting with mechanical ducts and pipes.	0-10V dimming	•Lithonia Lighting LED Highbay IBG series. •Philips Day-Brite Industrial LED high bay FBY with LFA option Series. • Oracle Lighting CB4-LED series.	18000lm	Gymnasium
<b>EMERGENCY LIGHTING</b>								
X1	120	LED		Architectural Edge-lit <b>Pictogram</b> Exit Sign, slim-profile extruded aluminum housing, high-output LED. Universal surface mounting - wall, ceiling, or end mount. Extruded acrylic panel with pictogram legend. Refer to drawings for mounting, number of faces and direction of arrows. <b>AC only.</b>		• Lumacell: LAE Series • Emergi-Lite: EAE Series • Beghelli: Ottica RM Series • Aimlite: RPEL Series • Stanpro: RMEA Series		Refer to Floor Plans
X2	120	MR16 LED 12V-6W each head		<b>LED remote emergency head</b> , highly resistant powder coated die-cast aluminum construction, 12V LED head (refer to drawing for head quantities), white finish, wall or ceiling mounted (refer to drawing for mounting). confirm colour with architect during shop drawing stage.		• Emergi-Lite EF150 series • Lumacell Stanpro M Series AimLite RMMD Series Or Approved Alternate		Refer to Floor Plans
BU-1	120	MR16 LED 12V-6W each head		<b>Emergency battery pack</b> , rugged steel housing cabinet, corrosion-resistant undercoating, solid state pulse type charger with test switch and AC-on pilot light, long life, maintenance free lead acid battery, 10 year life expectancy. Refer to drawing for batteries with lamps. Battery to provide minimum of 30 minutes of emergency power supply. Refer to floor plan for battery unit with heads.		• Emergi-Lite ESL series • Beghelli • Stanpro • Lumacell Or Approved Alternate		Refer to Floor Plans

LUMINAIRE SCHEDULE

File Name: 26009.001 - Luminaire Schedule

Smith + Andersen

Project Name: 26009.001 - ST. ANNE - KITCHENER

Project number: 26009.001



TYPE	VOLT.	LAMP(S)	DIMENSIONS	DESCRIPTION	DRIVERS/ POWER SUPPLY	MANUFACTURER/ CATALOGUE NUMBER	MINIMUM PERFORMANCE REQUIRED	LOCATED
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**NOTES:**

- All luminaires need to be consistent on technology and must match reference standard description regardless of catalogue number. Where finishes are not indicated, allow for special finish. Manufacturer/Catalogue number not listed will not be considered.
- The Electrical Contractor is responsible for the supply and installation of all fixed per unit cost luminaires as part of the base electrical contract. The Electrical Contractor is responsible for the installation of all cash allowance luminaires as part of the base electrical contract. Refer to specification 16505 or 26 51 13.00 for more details.
- LED's are to be latest technology to provide maximum lumens, binned, best colour and longest life at time of purchase. Drivers are to be the latest technology at time of purchase.
- LED luminaires dimensions listed are the maximum size allowed. Luminaires provided can be smaller than the dimension listed.
- All luminaires diameter and depth listed are the maximum size allowed. Luminaires provided can be smaller than the dimension listed.
- All LED luminaires that present signs of failure on site, within the warranty period, must be replaced at no cost to the owner. If temporary luminaires are required to replace any failed LED luminaires, during the waiting time for parts (i.e. drivers, boards, heat sinks, etc.), the labour cost including installation, temporary luminaire supply, temporary luminaire removal and reinstallation of the LED fixture must be provided at no cost of the owner. Additional electrical costs, associated with higher Wattage temporary luminaires, must be reimbursed with interest to the owner by the manufacturer.
- In case of failure of a LED luminaire complete or part thereof, an independent third party testing Laboratory (approved by Smith + Andersen) shall be commissioned by the manufacturer or vendor to perform tests on samples taken from the failed luminaires installed on corresponding site. All reporting including the test results must be submitted to Smith + Andersen for evaluation and final approval.
- Any additional time (related to luminaire manufacturing issues) involved by Smith + Andersen will be billed at our hourly rates to the manufacturer or vendor.
- All LED parts and accessories must be replaceable on site without removal of the luminaire.
- Equivalent samples will only be considered at Smith + Andersen discretion prior to tender close. Sample must be supplied with plug and cord for mock-up.
- When a mock-up is requested the full order of luminaires are on hold until approval and verification of the mock-up findings.