WATERLOO CATHOLIC DISTRICT SCHOOL BOARD

ST LOUIS MAIN CAMPUS - PHASE 2

INTERIOR RENOVATIONS

80 Young Street, Kitchener, Ontario

RFT-2021-28

"ISSUED FOR TENDER"

Project 21047.1

DATE NOVEMBER 2021

BARRY BRYAN ASSOCIATES
Architects, Engineers, Project Managers

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1.1 INVITATION

.1 Bid Call

1. Instructions for tendering must be followed implicitly. Any Tender which does not comply with the *CCDC 2-2008 Stipulated Price Contract, Supplementary Conditions, as attached*, and the Instructions to Bidders may be declared informal and may not be considered.
2. 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 Tenders must be signed under seal or signed under witness.

The WCDSB shall only accept Electronic Tender Submissions on or before **2:00:00pm November 30 2021 local time** and Followed by the Supplementary Form of Tender at **3:00:00 pm November 30 2021 local time**, each in the form of One (1) PDF file under 10 Megabyte (MB) and submitted to the email address below.

Submission Email Address: stephen.butterworth@wcdsb.ca

Bidders are cautioned that the timing of their Tender Submission is based on when the Bid is received by the Purchaser at the email address above, not when a Bid is submitted by a Bidder, as Bid transmissions can be delayed in an “Internet Traffic Jam” due to file transfer size, transmission speed, Firewalls, etc.

The Purchaser recommends that Bidder allow sufficient time to email their Tender Submission and attachment(s) and to resolve any issues that may arise. For Electronic Tender Submissions the closing time and date shall be determined by the Purchaser’s internal server clock.

3. 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.
4. Tenders shall be valid for thirty (30) Calendar Days from the date of closing above.
5. The Supplementary Form of Tender must be submitted at the close of Tender.
6. 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.
7. Offers submitted after above time shall be returned to Bidder unopened.

8. Amendments to submitted offer will not be permitted prior to bid closing, withdraw and resubmit Bid on Form of Tender.
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 Louis Main Campus Interior & Exterior Alterations located at 80 Young Street, 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 2-2008 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

1. Bid Documents may be obtained on Biddingo at biddingo.com.
2. Bid 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 is found in Bid Documents.

.4 Examination

1. Bid Tender Documents are on display only at Biddingo.
2. Upon receipt of Bid Documents verify that documents are complete.
3. Immediately notify, in writing, the Consultant upon finding discrepancies or omissions in Bid Documents.

.5 Queries/Addenda

1. Direct questions to office of the Consultant BY FAX OR E-MAIL, to the attention of Stephen Butterworth, Stephen.Butterworth@wcdsb.ca.
2. Addenda may be issued during bidding period or post-closing, if circumstances warrant post-closing addenda, in the sole discretion of the Board. All addenda become part of Contract Documents. Include costs in Bid Price.
3. Verbal answers are only binding when confirmed by written addenda.
4. Clarifications requested by bidders must be in writing 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.

.6 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.

3. 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:

Company: Barry Bryan Associates
Address: 201-250 Water Street
City: Whitby, Ontario
Phone: 905-666-5252
Fax: 905-666-5256

E-mail: kmercieca@bba-archeng.com
(Direct questions BY FAX or E-MAIL to the office of Nick Swerdfeger, OAA, MRAIC)

1.6 SUB CONSULTANTS

.1 The Structural Engineer for this Project is:

Company: Barry Bryan Associates
Address: 201-250 Water Street
City: Whitby, Ontario
Phone: 905-666-5252
Fax: 905-666-5256

.2 The Mechanical Consultant on this Project is:

Company: Decaria Engineering Ltd.
Address: 35 West Pearce St,
City: Richmond Hill, Ontario
Phone: 905-707-9200

.3 The Electrical Consultant on this Project is:

Company: Decaria Engineering Ltd.
Address: 35 West Pearce St,
City: Richmond Hill, Ontario
Phone: 905-707-9200

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

MECHANICAL TRADES

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

1.8 SITE ASSESSMENT

.1 Site Examination

1. Visit project site and surrounding area before submitting Bid.
2. Notwithstanding the responsibility, a Site Visit to project site has been arranged for General Contractors and their sub-trades as follows:
3. **Non mandatory Site Meeting on November 19, 2021 (9:00am EST) at 80 Young Street, Kitchener, Ontario.**
4. Meet at exterior main entry
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 2-2008 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 August 20, 2022 and having the entire building Totally Completed by August 27, 2022.
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 25%.
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 2-2008 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 2-2008 Stipulated Price Contract and the Supplementary Conditions, as attached. The successful Bidder must sign the CCDC 2-2008 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 thirty (30) 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. Prior to Tender Closing

1. A contractor who has submitted a bid on a project may request that his Bid be withdrawn.

.1 Shall be allowed if the request is made before the Bid closing time.

.2 Requests must be directed to the Consultant by letter, telegram, or in person.

.3 Telephone or fax requests shall not be considered.

2. When withdrawls of unopened Bids are made in person, the Consultant shall obtain a letter confirming the details. If the person who is withdrawing a Bid, is other than a Senior Official of the Company, the authenticity of the request must be confirmed by telephoning a responsible Official of the Company. Letters received after the Bid has been deposited but before Bid closing, shall, together with the confirmation at the opening by announcing that the Bid was withdrawn. The amount of a withdrawn Bid shall not be read out. The withdrawal of a Bid does not disqualify a Bidder from submitting another Bid on the same contract.

2. After Bid Closing
    1. Bids may not be withdrawn after the Bid closing except with forfeiture of the Bid bond or at the discretion of the Owner.

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.

END OF SECTION

1.1 TENDER INFORMATION

NAME OF BIDDER: _____

TENDER CLOSE: November 30, 2021 at 02:00:00 p.m.EST

SUPPLEMENTAL TENDER FORM CLOSE:

November 30, 2021 at 03:00:00 p.m. EST

NAME OF PROJECT: St Louis Main Campus Interior & Exterior Alterations

PROJECT NUMBER: RFT 2021-23

Submission Email Address: 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 2-2008 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 01 21 13 only amended as provided hereunder.

The Tender Amount includes the total Cash Allowance of $587,000.00 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 <u>including</u> all other applicable Excise Taxes, Custom Duties, Insurance's, Freight, Exchange and all other charges.

1.5 SEPARATE PRICES

.1 We submit the following SEPARATE PRICES which are included in the Total Stipulated Price. All or some of the items listed below may be removed from the project scope at the owner's discretion.

ITEM	DESCRIPTION	PRICE
1.	Barrier Free Lift including all associated architectural, structural, mechanical & electrical work within this area to complete scope. Refer to Dwg No. 6/A208, A601 & Associated drawings and specifications.	$_____
2.	All Supply and install of Doors, frames & Hardware (install only) for floors; 1st, 2nd & 3rd as per drawings, schedules and specifications. Refer to Dwg. No A901 (Door Schedule) & Div 08 11 00, 08 14 16, 08 71 00 & 08 80 05, with all associated Components.	$_____
3.	Basement scope including abatement, removals, equipment removals, gypsum board fire separations & new finishes. Refer to Dwg No. A201, Div. 02 41 00 & attached DSSR Report	$_____
4.	All exterior building repairs as noted on Dwg No. A301, A302 and associated drawings and specifications.	$_____
5.	Washroom(s) as per Dwg No. 9/A209. (All architectural, structural, mechanical & electrical work associated with renovations to rooms 105, 106, 107 & 107A)	$_____

1.6 TENDER VALIDITY

.1 The undersigned Bidder is hereby submitting a valid Tender and will enter into the *CCDC 2-2008 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 thirty (30) calendar days from the closing of the Tender.

1.7 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.

1.8 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 20, 2022;

(b) Have all buildings and site work completed by August 27, 2022 and

(c) Have the Contract completed in its entirety by August 27, 2022.

.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^{th}) 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

1.9 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.

1.10 FEES FOR CHANGES IN THE WORK

.1 The undersigned Bidder acknowledges and agrees that the fees referred to in *CCDC 2-2008 Stipulated Price Contract, as amended by the Supplementary Conditions*, *as attached*, will apply to changes in the Contract not covered by Unit Prices.

1.11 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
- UNIT PRICES
- ITEMIZED PRICES - REQUESTED BY CONSULTANTS
- ALTERNATE PRICES TO BASE BID
- LIST OF ALTERNATIVE BIDS SUBMITTED FOR CONSIDERATION

1.12 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.

1.13 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.

1.14 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.

1.15 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: _____

FAX 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: November 30, 2021 at 02:00:00 p.m EST

SUPPLEMENTAL TENDER FORM CLOSE:

November 30, 2021 at 03:00:00 p.m. EST

NAME OF PROJECT: St Louis Main Campus Interior & Exterior Alterations

PROJECT NUMBER: RFT 2021-28

Submission Email Address: 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.

Masonry _____

Structural Steel _____

Metal Fabrications _____

Cabinetwork _____

Sprayed Fireproofing _____

Roofing _____

Gypsum Board and Acoustical Ceilings _____

Ceramic Tile _____

Resilient Flooring _____

Painting _____

Whiteboards and Tackboards _____

Electrical _____

Mechanical _____

1.3 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 Receptacles:

Supply and installation of one duplex receptacle, shall include the receptacle box, cover plate, 5000mm of conduit and wiring, including connection to adjacent receptacle and/or outlet box.

		MORE WORK
.1	Supply and installation of one duplex receptacle	$_____

.6 Light Switches

Supply and installation of light switch shall include the switch box, cover plate, conduit, wiring and connection to box containing the lighting circuit.

MORE WORK

.1 Supply and installation of one 347 volt light switch. $_____

.7 Fire Alarm System:

MORE WORK

.1 Supply and installation of one fire alarm pull station, including conduits, wiring and connections to the nearest fire alarm pull station. (Base conduit and wiring on 1500mm length). $_____

.2 Supply and installation of one fire alarm cone speaker including conduit, wiring and connections to nearest fire alarm cone speaker. (Base conduit and wiring on 1500mm length). $_____

.8 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 $_____

.4 Supply and installation of one type 'E' fixture $_____

1.4 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

.6 Sprinkler Pipefitter & Installer $_____Per Hour

.7 Sprinkler Work Office/Engineer $_____Per Hour

1.5 SPRINKLER SUB-CONTRACTOR CASA MEMBERSHIP

Sprinkler Contractor shall be a paid member, and in good standing at time of Tender, of the Canadian Automatic Sprinkler Association. Attach membership certificate to this Supplementary Form of Tender.

.1 Labour at the following rates shall 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 Journeyman $_____ Per Hour

.2 Foreman $_____ 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.

Refer to Section […….], Article 2.1 and/or item 1.8 in this Supplementary Form of Tender for "Standards of Materials".

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

	Product/Equipment Specified	Proposed Substitution	Reduction in Contract Price
.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	Coupco, 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

BASE BID ITEM	ACCEPTABLE BASIS OF DESIGN	Trerice 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	
ElectricalStarters, 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: _____

FAX 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

CCDC 2- 2008

Stipulated Price Contract

Supplementary Conditions

November 10, 2009

2nd Revision: 1 February 2013

The Standard Construction Document CCDC 2 2008 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 is hereby made part of these *Contract Documents*, with the following amendments, additions and modifications:

AGREEMENT BETWEEN OWNER AND CONTRACTOR

ARTICLE A-3 – CONTRACT DOCUMENTS

3.1 Add the following to the list of *Contract Documents* in paragraph 3.1:

- Amendments to CCDC 2 – 2008
- *Drawings*
- *Specifications*
- Performance Bond
- Labour and Material Payment Bond

ARTICLE A-5 – PAYMENT

5.1.3 Amend paragraph 5.1.3, in the first line, by deleting the words "…the issuance of the…" and replacing them with "…receipt of the *Consultant's*..."

5.3.1 Delete paragraph 5.3.1 in its entirety and replace it with the following:

Interest
.1 Should either party fail to make payments as they become due under the terms of the Contract or in an award by arbitration or court, interest shall also become due and payable on such unpaid amounts at 0% above the prime rate. Such interest shall be compounded on a monthly basis. The prime rate shall be the rate of interested quoted by the Bank of Canada for prime business loans, as it may change from time to time.

ARTICLE A-9 – CONFLICT OF INTEREST

Add new Article A-9 – Conflict of Interest:

9.1 The *Contractor*, all of the *Subcontractors* and *Suppliers* 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 *Owner*) with the provision of the *Work* pursuant to the *Contract*. The *Contractor* acknowledges and agrees that a conflict of interest, as described in this Article A-9, includes, but is not limited to, the use of *Confidential Information* where the *Owner* has not specifically authorized such use.

9.2 The *Contractor* shall disclose to the *Owner*, 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 *Subcontractor* or *Supplier* that is directly or indirectly affiliated with or related to the *Contractor*.

9.3 The *Contractor* covenants and agrees that it will not hire or retain the services of any employee or previous employee of the *Owner* where to do so constitutes a breach by such employee or previous employee of the *Owner's* conflict of interest policy, as it may be amended from time to time, until after completion of the *Work* under the *Contract*.

9.4 It is of the essence of the *Contract* that the *Owner* shall not have direct or indirect liability to any *Subcontractor* or *Supplier*, and that the *Owner* relies on the maintenance of an arm's-length relationship between the *Contractor* and its *Subcontractors* and *Suppliers*. Consistent with this fundamental term of the *Contract*, the *Contractor* will not enter into any agreement or understanding with any *Subcontractor* or *Supplier*, 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 *Owner*, directly or through the *Contractor*, where such claim is, in whole or in part, in respect of a disputed claim by the *Subcontractor* or *Supplier* against the *Contractor*, where the payment to the *Subcontractor* or *Supplier* by the *Contractor* is agreed to be conditional or contingent on the ability to recover those amounts or a portion thereof from the *Owner*, failing which the *Contractor* shall be saved harmless from all or a portion of those claims. The *Contractor* acknowledges that any such agreement would undermine the required arm's-length relationship and constitute a conflict of

interest. For greater certainty, the *Contractor* shall only be entitled to advance claims against the *Owner* for amounts pertaining to *Subcontractor* or *Supplier* claims where the *Contractor* has actually paid or unconditionally acknowledged liability for those claims or where those claims are the subject of litigation or binding arbitration between the *Subcontractor* or *Supplier* and the *Contractor* has been found liable for those claims.

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, SUSPEND THE WORK OR TERMINATE THE CONTRACT, a breach of this Article by the *Contractor*, any of the *Subcontractors,* or any of their respective advisors, partners, directors, officers, employees, agents, and volunteers shall entitle the *Owner* to terminate the *Contract*, in addition to any other rights and remedies that the *Owner* has in the *Contract*, in law, or in equity.

DEFINITIONS

Add the following new definitions:

27. **Confidential Information**

Confidential Information means all the information or material of the *Owner* 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 *Contractor* at any time, but *Confidential Information* shall not include information that:

1) is or becomes generally available to the public without fault or breach on the part of the *Contractor*, including without limitation breach of any duty of confidentiality owed by the *Contractor* to the *Owner* or to any third party, but only after that information becomes generally available to the public;

2) the *Contractor* can demonstrate to have been rightfully obtained by the *Contractor* from a third party who had the right to transfer or disclose it to the *Contractor* free of any obligation of confidence;

3) the *Contractor* can demonstrate to have been rightfully known to or in the possession of the *Contractor* at the time of disclosure, free of any obligation of confidence; or

4) is independently developed by the *Contractor* without use of any *Confidential Information*.

28. Construction Schedule

Construction Schedule means the schedule for the performance of the *Work* provided by the *Contractor* pursuant to GC 3.5, including any amendments to the *Construction Schedule* made pursuant to the *Contract Documents*.

29. Force Majeure

Force Majeure means any cause, beyond the *Contractor's* control, other than bankruptcy or insolvency, which prevents the performance by the *Contractor* of any of its obligations under the *Contract* and the event of *Force Majeure* was not caused by the *Contractor's* default or active commission or omission and could not be avoided or mitigated by the exercise of reasonable effort or foresight by the *Contractor*. *Force Majeure* includes *Labour Disputes*, fire, unusual delay by common carriers or unavoidable casualties, civil disturbance, 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, or acts of God.

30. Install

Install means install and connect. *Install* has this meaning whether or not the first letter is capitalized.

31. Labour Dispute

Labour Dispute 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 *Work*.

32. Overhead

Overhead 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 *Place of the Work*; 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.

33. Request for Information/RFI

Request for Information or *RFI* means written documentation sent by the *Contractor* to the *Owner* or to the *Owner's* representative or the *Consultant* requesting written clarification(s) and/or interpretation(s) of the *Drawings* and/or *Specifications*, *Contract* requirements and/or other pertinent information required to complete the *Work* of the *Contract* without applying for a change or changes to the *Work*.

16. Amend Definition 16 by adding the following to the end of the Definition:

Provide has this meaning whether or not the first letter is capitalized.

GENERAL CONDITIONS OF THE STIPULATED PRICE CONTRACT

1.0 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.

GC 1.1 CONTRACT DOCUMENTS

1.1.6 Add the following to the end of paragraph 1.1.6:

The *Specifications* 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 *Contract Documents* will be construed to place responsibility on the *Owner* or the *Consultant* to settle disputes among the *Subcontractors* and *Suppliers* with respect to such divisions. The *Drawings* are, in part, diagrammatic and are intended to convey the scope of the *Work* and indicate general and appropriate locations, arrangements and sizes of fixtures, equipment and outlets. The *Contractor* shall obtain more accurate information about the locations, arrangements and sizes from study and coordination of the *Drawings*, including *Shop Drawings* and shall become familiar with conditions and spaces affecting those matters before proceedings with the *Work*. Where site conditions require reasonable minor changes where the change requires only the additional labour of one half hour or less, the *Contractor* shall make such changes at no additional cost to the *Owner*. Similarly, where known conditions or existing conditions interfere with new installation and require relocation, the *Contractor* shall include such relocation in the *Work*. The *Contractor* 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 *Contact Documents*, wherever located and whenever issued, which compile information of similar content and may consist of drawings, tables and/or lists.

1.1.7 Amend paragraph 1.1.7.1 by adding "Amendments to CCDC 2 – 2008" before "the Agreement between the Owner and the Contractor" and deleting the reference to "Supplementary Conditions".

Add new paragraphs 1.1.7.5, 1.1.7.6, 1.1.7.7, 1.1.7.8, 1.1.7.9 and 1.1.7.10 as follows**:**

.5 noted materials and annotations on the *Drawings* shall govern over the graphic representation of the *Drawings.*

.6 finishes in the room finish schedules shall govern over those shown on the *Drawings.*

.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 *Consultant* or its sub-*Consultants* are to remain with each of the applicable drawing disciplines.

.8 should reference standards contained in the *Specifications* conflict with the *Specifications,* the *Specifications* shall govern. Should reference standards and *Specifications* conflict with each other or if certain requirements of the *Specifications* conflict with other requirements of the *Specifications*, the more stringent requirements shall govern.

1.1.8 Delete paragraph 1.1.8 in its entirety and substitute as follows:

The *Consultant*, on behalf of the *Owner* shall provide the *Contractor* without charge, twelve (12) copies of the *Contract Documents*, exclusive of those required by jurisdictional authorities and the executed *Contract Documents*. Additional copies can be purchased by the *Contractor* at the *Consultant's* cost of reproduction, handling and sales tax.

GC 1.3 RIGHTS AND REMEDIES

1.3.2 Delete the word "No" from the beginning of paragraph 1.3.2 and substitute the words:

"Except with respect to the requirements set out in paragraphs 2.2.13, 6.4.1, 6.5.4, 6.6.1 and 8.2.2, no…"

GC 1.4 ASSIGNMENT

Delete paragraph 1.4.1 in its entirety and replace with the following:

1.4.1 The *Contractor* shall not assign the *Contract*, or any portion thereof, without the prior written consent of the *Owner*. The *Owner* shall be entitled to assign the *Contract* to a corporation, partnership or other entity (the "Assignee"). Upon the assumption by the Assignee of the *Owner's* obligations under the *Contract*, the *Owner* shall be released from its obligations under the *Contract*.

GC 1.5 EXAMINATION OF DOCUMENTS AND SITE

Add new GC 1.5 – EXAMINATION OF DOCUMENTS AND SITE as follows:

1.5.1 The *Contractor* declares and represents that in tendering for the *Work*, and in entering into a *Contract* with the *Owner* for the performance of the *Work*, it has investigated for itself the character of the *Work* to be done, based on information generally available from a site visit. The *Contractor* has assumed and does hereby assume all risk of conditions now existing or arising in the course of the *Work* which might or could make the *Work*, or any items thereof more expensive in character, or more onerous to fulfil, than was contemplated or known when the tender was made or the *Contract* signed.

1.5.2 The *Contractor* also declares that in tendering for the *Work* and in entering into this *Contract,* the *Contractor* did not and does not rely upon information furnished by the *Owner* or any of its agents or servants respecting the nature or confirmation of the ground at the site of the *Work*, or the location, character, quality or quantity of the materials to be removed or to be employed in the construction of *Work*, or the character of the construction machinery and equipment or facilities needed to perform the *Work*, or the general and local performance of the work under the *Contract* and expressly waives and releases the *Owner* from all claims with respect to the said information with respect to the *Work*.

GC 1.6 TIME IS OF THE ESSENCE OF THE CONTRACT

Add new GC 1.6 - TIME IS OF THE ESSENCE OF THE CONTRACT as follows

1.6.1 All time limits stated in the *Contract Documents* are of the essence of the *Contract*.

GC 2.2 ROLE OF THE CONSULTANT

2.2.7 Delete the words "Except with respect to GC 5.1 – FINANCING INFORMATION REQUIRED OF THE OWNER".

2.2.13 Amend paragraph 2.2.13 by the addition of the following to the end of that paragraph:

If, in the opinion of the *Contractor*, the *Supplemental Instruction* involves an adjustment in the *Contract Price* or in the *Contract Time*, it shall, within ten (10) *Working Days* of receipt of a *Supplemental Instruction*, provide the *Consultant* with a notice in writing to that effect. Failure to provide written notification within the time stipulated in this paragraph 2.2.13 shall be deemed an acceptance of the *Supplemental Instruction* by the *Contractor*, without any adjustment in the *Contract Price* or *Contract Time*.

2.2.19 Add new paragraph 2.2.1.9 as follows:

The *Consultant* or the *Owner*, acting reasonably, may from time to time require the *Contractor* to remove from the *Project* any personnel of the *Contractor*, including project managers, superintendents or *Subcontractors*. Such persons shall be replaced by the *Contractor* in a timely fashion to the satisfaction of the *Consultant* or the *Owner*, as the case may be, at no cost to the *Owner*.

GC 2.3 REVIEW AND INSPECTION OF THE WORK

2.3.2 Amend paragraph 2.3.2 by adding the words "and *Owner*" after the words "*Consultant*" in the second and third lines.

2.3.3 Delete paragraph 2.3.3 in its entirety and replace it with the following:

The *Contractor* shall furnish promptly two copies to the *Consultant* and one copy to the *Owner* of all certificates and inspection reports relating to the *Work*.

2.3.4 Insert the word "review" after the word "inspections" in the first line of paragraph 2.3.4.

2.3.5 In the first line after *"Consultant"*, add "or the *Owner"*.

2.3.8 Add a new paragraph 2.3.8 as follows:

The *Consultant* will conduct periodic reviews of the *Work* in progress, to determine general conformance with the requirements of the *Contract Documents*. Such reviews, or lack thereof, shall not give rise to any claims by the *Contractor* in connection with construction means, methods, techniques, sequences and procedures, nor in connection with construction safety at the *Place of Work*, responsibility for which belongs exclusively to the *Contractor*.

GC 2.4 DEFECTIVE WORK

2.4.1 Amend GC 2.4.1 by inserting ", the *Owner* and/or its agent" in the first sentence following "rejected by the *Consultant*".

Add new paragraphs 2.4.1.1 and 2.4.1.2:

2.4.1.1 The *Contractor* shall rectify, in a manner acceptable to the *Consultant* and to the *Owner through the Consultant* all defective work and deficiencies throughout the *Work*, whether or not they are specifically identified by the *Consultant*.

2.4.1.2 The *Contractor* shall prioritize the correction of any defective work, which, in the sole discretion of the *Owner through the Consultant*, adversely affects the day to day operations of the *Owner* or which, in the sole discretion of the *Consultant*, adversely affects the progress of the *Work*.

2.4.2 Delete paragraph 2.4.2 in its entirety and replace it with the following:

The *Contractor* shall promptly pay the *Owner* for costs incurred by the *Owner*, the *Owner's* own forces or the *Owner's* other contractors, for work destroyed or damaged or any alterations necessitated by the *Contractor's* removal, replacement or re-execution of defective work.

Add new paragraph 2.4.4 as follows:

2.4.4 Neither acceptance of the *Work* by the *Consultant* or the *Owner*, nor any failure by the *Consultant* or the *Owner* to identify, observe or warn of defective *Work* or any deficiency in the *Work* shall relieve the *Contractor* from the sole responsibility for rectifying such defect or deficiency at the *Contractor's* sole cost, even where such failure to identify, observe or warn is negligent.

GC 3.1 CONTROL OF THE WORK

3.1.3 Add a new paragraph 3.1.3 as follows:

Prior to commencing individual procurement, fabrication and construction activities, the *Contractor* shall verify at the *Place of the Work*, all relevant measurements and levels necessary for proper and complete fabrication, assembly and installation of the *Work* and shall further carefully compare such field measurements and conditions with the requirements of the *Contract Documents*. Where dimensions are not included or exact locations are not apparent, the *Contractor* shall immediately notify the *Consultant* in writing and obtain written instructions from the *Consultant* before proceedings with any part of the affected *Work*.

3.1.4 Add a new paragraph 3.1.4 as follows:

Notwithstanding the provisions of paragraphs 3.1.1 and 3.1.2, the *Owner* 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 *Contractor* to fulfill its contractual obligations.

GC 3.2 CONSTRUCTION BY OWNER OR OTHER CONTRACTORS

3.2.2.1 Delete paragraph 3.2.2.1 in its entirety.

3.2.2.2 Delete paragraph 3.2.2.2 in its entirety.

3.2.2.3 Delete paragraph 3.2.2.3 in its entirety.

3.2.2.4 Delete paragraph 3.2.2.4 in its entirety.

3.2.3.2 Delete paragraph 3.2.3.2 and replace it with the following:

Co-ordinate and schedule the activities and work of other contractors and *Owner's* own forces with the *Work* of the *Contractor* and connect as specified or shown in the *Contract Documents*.

3.2.3.4 Add new paragraph 3.2.3.4 as follows:

Subject to GC 9.4 CONSTRUCTION SAFETY, for the *Owner's* 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 *Place of the Work*, including all of the responsibilities of the "constructor", pursuant to the *Occupational Health and Safety Act* (Ontario).

GC 3.3 TEMPORARY WORK

3.3.2 In paragraph 3.3.2, in the second line after the words "where required by law", insert "or the *Consultant*".

GC 3.4 DOCUMENT REVIEW

3.4.1 Delete paragraph 3.4.1 in its entirety and substitute new paragraph 3.4.1:

The *Contractor* shall review the *Contract Documents* and shall report promptly to the *Consultant* any error, inconsistency, or omission the *Contractor* may discover. Such review by the *Contractor* shall be undertaken with the standard of care described in paragraph 3.14.1 of the *Contract*. Except for its obligation to make such review and report the result, the *Contractor* does not assume any responsibility to the *Owner* or to the *Consultant* for the accuracy of the *Contract Documents*. Provided it has exercised the degree of care and skill described in this paragraph 3.4.1, the *Contractor* shall not be liable for damage or costs resulting from such errors, inconsistencies, or omissions in the *Contract Documents*, which the *Contractor* could not reasonably have discovered through the exercise of the required standard of care.

3.4.2 Add new paragraph 3.4.2. as follows:

If, at any time, the *Contractor* finds errors, inconsistencies, or omissions in the *Contract Documents* or has any doubt as to the meaning or intent of any part thereof, including laying out of the Work, the *Contractor* shall immediately notify the *Consultant*, and request instructions, a *Supplemental Instruction, Change Order,* or *Change Directive,* as the case may require, and the *Contractor* shall not proceed with the work affected until the *Contractor* has received such instructions, a *Supplemental Instruction*, *Change Order* or *Change Directive*. Neither the *Owner* nor the *Consultant* will be responsible for the consequences of any action of the *Contractor* based on oral instructions.

3.4.3 Add new paragraphs 3.4.3 as follows:

Errors, inconsistencies and/or omissions in the *Drawings* and/or *Specifications* which do not allow completion of the *Work* of the *Contract* shall be brought to the *Consultant's* attention prior to the execution of the *Contract* by means of an *RFI.*

GC 3.5 CONSTRUCTION SCHEDULE

3.5.1 Delete paragraph 3.5.1 in its entirety and replace with the following:

The *Contractor* shall:

.1 within five (5) calendar days of receiving written confirmation of the award of the Contract, prepare and submit to the *Owner* and the *Consultant* for their review and acceptance, a construction schedule in the format indicated below that indicates the timing of the activities of the *Work* and provides sufficient detail of the critical events and their inter-relationship to demonstrate the *Work* will be performed in conformity with the *Contract Time* and in accordance with the *Contract Documents.* Such schedule is to include a delivery schedule for *Products* whose delivery is critical to the schedule for the *Work* or are required by the *Contract* to be included in a *Products* delivery schedule. The *Contractor* shall employ construction scheduling software, being the latest version of "Microsoft Project", that permits the progress of the *Work* to be monitored in relation to the critical path established in the schedule. The *Contractor* shall provide the schedule and any successor or revised schedules in both electronic format and hard copy. Once accepted by the *Owner* and the *Consultant*, the construction schedule submitted by the *Contractor* shall become the baseline construction schedule; and,

.2 provide the expertise and resources, such resources including manpower and equipment, as are necessary to maintain progress under the accepted baseline construction schedule or revised schedule accepted by the *Owner* pursuant to GC 3.5 CONSTRUCTION SCHEDULE; and,

.3 monitor the progress of the *Work* on a weekly basis relative to the baseline construction schedule, or any revised schedule accepted by the *Owner* pursuant to GC 3.5 CONSTRUCTION SCHEDULE, update and submit to the *Consultant* and *Owner* the electronic and hard copy schedule on a monthly basis, at a minimum, or as required by the *Consultant* and advise the *Consultant* and the *Owner* weekly in writing of any variation from the baseline or slippage in the schedule; and,

.4 provide overtime work without change to the *Contract Price* if such work is deemed necessary to meet the schedule; and,

.5 ensure that the *Contract Price* shall include all costs required to phase or stage the *Work*.

3.5.2 Add new paragraph 3.5.2 as follows:

If, at any time, it should appear to the *Owner* or the *Consultant* that the actual progress of the *Work* is behind schedule or is likely to become behind schedule, or if the *Contractor* has given notice of such to the *Owner* or the *Consultant* pursuant to

subparagraph 3.5.1.3, the *Contractor* shall, either at the request of the *Owner* or the *Consultant*, or following giving notice pursuant to subparagraph 3.5.1.3, take appropriate steps to cause the actual progress of the *Work* to conform to the schedule or minimize the resulting delay. Within five (5) calendar days of the request by the *Owner* or the *Consultant* or the notice being given pursuant to subparagraph 3.5.1.3, the *Contractor* shall produce and present to the *Owner* and the *Consultant* a plan demonstrating how the *Contractor* will achieve the recovery of the last accepted schedule.

3.5.3 The *Contractor* is responsible for performing the *Work* within the *Contract Time*. Any schedule submissions revised from the accepted baseline construction schedule or revised schedule accepted by the *Owner* pursuant to GC 3.5 CONSTRUCTION SCHEDULE, during construction are not deemed to be approved extensions to the *Contract Time.* All extensions to the *Contract Time* must be made in accordance with the *Contract Documents*.

GC 3.6 SUPERVISION

Delete paragraph 3.6.1 in its entirety and replace with the following:

3.6.1 The *Contractor* shall employ a competent full-time superintendent, acceptable to the *Owner* and *Consultant*, who shall be in full time attendance at the *Place of Work* while the *Work* is being performed. The superintendent shall not be changed by the *Contractor* without valid reason which shall be provided in writing and shall not be changed without prior consultation with and agreement by the *Owner* and the *Consultant*. The *Contractor* shall replace the superintendent within 7 *Working Days* of the *Owner's* written notification, if the superintendent's performance is not acceptable to the *Owner*. The *Contractor* shall provide the *Owner* and the *Consultant* with the names, addresses and telephone numbers of the superintendent referred to in this paragraph 3.6.1 and other responsible persons who may be contacted for emergency and other reasons during non-working hours.

Delete paragraph 3.6.2 in its entirely and replace with the following:

3.6.2 The superintendent, and any project manager appointed by the *Contractor*, shall represent the *Contractor* at the *Place of Work* and shall have full authority to act on written instructions given by the *Consultant* and/or the *Owner*. Instructions given to the superintendent or the project manager shall be deemed to have been given to the *Contractor* and both the superintendent and any project manager shall have full authority to act on behalf of the *Contractor* and bind the *Contractor* in matters related to the *Contract*.

3.6.3 Add new paragraph 3.6.3 , 3.6.4, 3.6.5 and 3.6.6 as follows:

The *Owner* may, at any time during the course of the *Work*, request the replacement of the appointed representative(s). Immediately upon receipt of the request, the *Contractor* shall make arrangements to appoint an acceptable replacement, which is approved by the *Owner*.

3.6.4 The supervisory staff assigned to the *Project* shall also be fully competent to implement efficiently all requirements for scheduling, coordination, field engineering, reviews, inspections and submittals defined in the *Specifications,* and have minimum 5 years documented "Superintendent/Project Management" experience.

3.6.5 The *Consultant and Owner* shall reserve the right to review the record of experience and credentials of supervisory staff assigned to the *Project* prior to commencement of the *Work*.

3.6.6 A superintendent assigned to the *Work* 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 *Project* to the sole satisfaction of the *Owner*.

GC 3.7 SUBCONTRACTORS AND SUPPLIERS

3.7.1.1 In paragraph 3.7.1.1 add to the end of the second line "including any warranties and service agreements which extend beyond the term of the *Contract*."

3.7.1.2 In subparagraph 3.7.1.2 after the words "the *Contract Documents*" insert the words "including any required surety bonding".

Delete paragraph 3.7.2. in its entirety and replace with the following:

3.7.2 Substitution of any *Subcontractor* and/or *Suppliers* after submission of the *Contractor's* bid will not be accepted unless a valid reason is given in writing to and approved by the *Owner*, whose approval may be arbitrarily withheld. The reason for substitution must be provided to the *Owner* and to the original *Subcontractor* and/or *Supplier* and the *Subcontractor* and/or *Supplier* shall be given the opportunity to reply to the *Contractor* and *Owner.* The *Contractor* shall be fully aware of the capability of each *Subcontractor* and/or *Supplier* included in its bid, including but not limited to technical ability, financial stability and ability to maintain the proposed construction schedule.

Add new paragraphs 3.7.7 and 3.7.8 as follows:

3.7.7 Where provided in the *Contract*, the *Owner* may assign to the *Contractor*, and the *Contractor* agrees to accept, any contract procured by the *Owner* for *Work* or services required on the *Project* that has been pre-tendered or pre-negotiated by the *Owner*, and upon such assignment, the *Owner* shall have no further liability to any party for such contract.

3.7.8 The *Contractor* covenants that each subcontract or supply contract which the *Contractor* enters into for the purpose of performing the *Work* shall expressly provide for the assignment thereof to the *Owner* (at the option of the *Owner*) and the assumption by the *Owner* of the obligations of the *Contractor* thereunder, upon the termination of the *Contract* and upon written notice by the *Owner* to the other parties to such subcontracts or supply contracts, without the imposition of further terms or conditions; provided, however, that until the *Owner* has given such notice, nothing herein contained shall be deemed to create any contractual or other liability upon the *Owner* for the performance of obligations under such subcontracts or supply contracts and the *Contractor* shall be fully responsible for all of its obligations and liabilities (if any) under such subcontracts and supply contracts.

GC 3.8 LABOUR AND PRODUCTS

3.8.2 Delete paragraph 3.8.2 and substitute with the following:

Products 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 *Place of the Work*, unless otherwise specified. *Products* which are not specified shall be of a quality consistent with those specified and their use acceptable to the *Consultant*. *Products* brought on to the *Place of the Work* by the *Contractor* shall be deemed to be the property of the *Owner*, but the *Owner* shall be under no liability for loss thereof or damage thereto arising from any cause whatsoever. The said *Products* shall be at the sole risk of the *Contractor*. Workmanship shall be, in every respect, first class and the *Work* shall be performed in accordance with the best modern industry practice.

3.8.3 Amend paragraph 3.8.3 by adding the words, "…, agents, *Subcontractors* and *Suppliers*…" after the word "employees" in the first line.

Add new paragraphs 3.8.4, 3.8.5, 3.8.6, 3.8.7, 3.8.8 and 3.8.9 as follows:

3.8.4 Upon receipt of a written notice from the *Owner,* the *Contractor* shall immediately remove from the *Place of the Work*, tradesmen and labourers whose conduct jeopardizes the safety of the *Owner's* operations. Immediately upon receipt of the request, the C**ontractor** shall make arrangements to appoint an acceptable replacement.

3.8.5 Upon receipt of written notice from the *Consultant,* the *Contractor* shall remove from the *Place of Work,* tradesmen and labourers whose *Work* is unsatisfactory to the *Consultant* or who are considered by the *Consultant* to be unskilled or otherwise objectionable.

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3.86 The *Contractor* shall cooperate with the *Owner* and its representatives and shall take all reasonable and necessary actions to maintain stable and harmonious labour relations with respect to the *Work* at the *Place of the Work*, including cooperation to attempt to avoid *Work* stoppages, trade union jurisdictional disputes and other *Labour Disputes*. Any costs arising from labour disputes shall be at the sole expense of the *Contractor.*

3.8.7 The cost for overtime required beyond the normal *Working Day* to complete individual construction operations of a continuous nature, such as pouring or finishing of concrete or similar work, or *Work* that the *Contractor* elects to perform at overtime rates without the *Owner* requesting it, shall not be chargeable to the *Owner*.

3.8.8 All manufactured *Products* which are identified by their proprietary names or by part or catalogue number in the *Specifications* shall be used by the *Contractor.* No substitutes for such specified *Products* shall be used without the written approval of the *Owner* and the *Consultant*. Substitutes will only be considered by the *Consultant* when submitted in sufficient time to permit proper review and investigation. When requesting approval for the use of substitutes, the *Contractor* shall include in its submission any proposed change in the *Contract Price*. The *Contractor* shall use all proprietary *Products* in strict accordance with the manufacturer's directions. Where there is a choice of proprietary *Products* specified for one use, the *Contractor* may select any one of the *Products* so specified for this use.

3.8.9 Materials, appliances, equipment and other *Products* are sometimes specified by reference to brand names, proprietary names, trademarks or symbols. In such cases, the name of a manufacturer, distributor, *Supplier* or dealer is sometimes given to assist the *Contractor* to find a source *Supplier*. This shall not relieve the *Contractor* from its responsibility from finding its own source of supply even if the source names no longer supplies the *Product* specified. If the *Contractor* is unable to obtain the specified *Product*, the *Contractor* shall supply a substitute product equal to or better than the specified *Product,* as approved by the *Consultant* with no extra compensation. Should the *Contractor* be unable to obtain a substitute *Product* equal to or superior to the specified *Product* and the *Owner* accepts a different Product, the *Contract Price* shall be adjusted accordingly, as approved by the *Consultant*.

GC 3.9 DOCUMENTS AT THE SITE

3.9.1 Delete paragraph 3.9.1 in its entirety and substitute the following:

The *Contractor* shall keep one copy of the current *Contract Documents*, *Supplemental Instructions*, contemplated *Change Orders*, *Change Orders*, *Change Directives*, cash allowance disbursement authorizations, reviewed *Shop Drawings*, submittals, reports and records of meeting at the *Place of the Work*, in good order and available to the *Owner* and *Consultant*.

GC 3.10 SHOP DRAWINGS

3.10.1 Delete paragraph 3.10.1 in its entirety and replace with the following:

The *Contractor* shall provide shop drawings as described in the *Contract Documents* and as the *Consultant* may reasonably request**.**

3.10.9 Delete paragraph 3.10.9 in its entirety and substitute the following:

At the time of providing *Shop Drawings*, the *Contractor* shall advise the *Consultant* in writing of any deviations in *Shop Drawings* from the requirements of the *Contract Documents*. The *Consultant* 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.

Add new paragraphs 3.10.13, 3.10.14, 3.10.15, 3.10.16, 3.10.17 and 3.10.18 as follows:

3.10.13 Reviewed *Shop Drawings* shall not authorize a change in the *Contract Price* and/or the *Contract Time*.

3.10.14 The *Contractor* shall prepare a *Shop Drawings* schedule acceptable to the *Owner* and the *Consultant* prior to the first application for payment. A draft of the proposed *Shop Drawings* schedule shall be submitted by the *Contractor* to the *Consultant* and the *Owner* for approval. The draft *Shop Drawings* schedule shall clearly indicate the phasing of *Shop Drawings* submissions. The *Contractor* shall periodically re-submit the *Shop Drawings* schedule to correspond to changes in the construction schedule.

3.10.15 Except where the parties have agreed to a different *Shop Drawings* schedule pursuant to paragraph 3.10.3, the *Contractor* shall comply with the requirements for *Shop Drawings* submissions stated in the *Specifications*.

3.10.16 The *Contractor* shall not use the term "by others" on *Shop Drawings* or other submittals. The related trade, *Subcontractor* or *Supplier* shall be stated.

3.10.17 Certain *Specifications* sections require the *Shop Drawings* to bear the seal and signature of a professional engineer. Such professional engineer must be registered in the jurisdiction of the *Place of the Work* and shall have expertise in the area of practice reflected in the *Shop Drawings*.

3.10.18 The *Consultant* will review and return *Shop Drawings* and submittals in accordance with the schedule agreed upon in paragraph 3.10.3, The *Contractor* shall allow the *Consultant* a minimum of 10 *Working Days* to review *Shop Drawings* from the date of receipt. If resubmission of *Shop Drawings* is required, a further 10 *Working Day* period is required for the *Consultant's* review.

GC 3.11 USE OF THE WORK

3.11.1 In the second line between the words "permits and "or" add", by direction of the *Owner* or *Consultant.*

3.11.3 Add new paragraph 3.11.3 as follows:

The *Owner* shall have the right to enter or occupy the *Work* in whole or in part for the purpose of placing fittings and equipment, or for other use before *Substantial Performance of the Work*, if, in the opinion of the *Consultant*, such entry and occupation does not prevent or substantially interfere with the *Contractor* in the performance of the *Contract* within the *Contract Time.* Such entry or occupation shall neither be considered as acceptance of the *Work*, nor in any way relieve the *Contractor* from its responsibility to complete the *Contract*.

GC 3.12 CUTTING AND REMEDIAL WORK

Add new paragraphs 3.12.5 and 3.12.6 as follows:

3.12.5 Unless specifically stated otherwise in the *Specifications*, the *Contractor* shall do all cutting and making good necessary for the proper installation and performance of the *Work.*

3.12.6 To avoid unnecessary cutting, the *Contractor* shall lay out its work and advise the *Subcontractors,* when necessary, where to leave holes for installation of pipes and other work.

GC 3.13 CLEAN UP

3.13.1 At the end of the paragraph 3.13.1, add the following:

Remove accumulated waste and debris at least once a week as a minimum or as required by the nature of the *Work.*

3.13.2 In paragraph 3.13.2, in the fourth line add the word "materials" between the word "tools" and the words "*Construction Equipment*".

3.13.3 In paragraph 3.13.3, in the first and second lines add the word "materials" between the word "tools" and the words "*Construction Equipment*".

Add new paragraphs 3.13.4, 3.13.5 ,3.13.6 and 3.13.7 as follows:

3.13.5 The *Contractor* shall clean up garbage during and after construction, and maintain the site in a neat and orderly condition on a daily basis. Prior to leaving the site at the end of construction, the *Contractor* shall make good all damage to the building and its components caused by the performance of the *Work* or by any *Subcontractor* or *Supplier*. The *Contractor* shall leave the site in a clean and finished state; remove all equipment and materials; remove all paint, stains, labels, dirt, etc. from the *Work*; and touch up all damaged painted areas.

3.13.6 Without limitation to or waiver of the *Owner's* other rights and remedies, the *Owner* shall have the right to back charge to the *Contractor* the cost of damage to the site caused by transportation in and out of the site by the *Contractor*, *Subcontractors* or *Suppliers,* if not repaired before final payment.

3.13.7 The *Contractor* shall dispose of debris at location and in a manner acceptable to the *Owner*, and authorities having jurisdiction in the area of the *Work* and the disposal area, and cover containers with tarpaulins tied in place to prevent scattering of debris on site and during transport.

GC 3.14 CONTRACTOR STANDARD OF CARE

Add a new General Condition 3.14 – CONTRACTOR STANDARD OF CARE as follows:

3.14.1 In performing its services and obligations under the *Contract*, the *Contractor* 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 *Contractor* acknowledges and agrees that throughout the *Contract,* the performance of the *Contractor's* obligations, duties and responsibilities shall be judged against this standard. The *Contractor* shall exercise the same standard of care, skill and diligence in respect of any *Products*, personnel or procedures which it may recommend to the *Owner*.

3.14.2 The *Contractor* further represents, covenants and warrants to the *Owner* that:

.1 the personnel it assigns to the *Project* are appropriately experienced;

.2 it has a sufficient staff of qualified and competent personnel to replace any of its appointed representatives, subject to the *Owner's* approval, in the event of death, incapacity, removal or resignation; and

.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 *Contractor* to perform its work under the *Contract*.

GC 3.15 OCCUPANCY OF THE WORK

3.15.1 The *Owner* 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 *Work* may not be substantially performed, provided that such taking possession and use will not interfere, in any material way, with the progress of the *Work.* The taking of possession or use of any such portion of the *Project* shall not be deemed to be the *Owner's* acknowledgement or acceptance of the *Work* or the *Project*, nor shall it relieve the *Contractor* of any of its obligations under the *Contract*.

3.15.2 Whether the *Project* contemplates *Work* by way of renovations in buildings which will be in use or be occupied during the course of the *Work* or where the *Project* involves *Work* that is adjacent to a structure which is in use or is occupied, the *Contractor,* without in any way limiting its responsibilities under the *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.

GC 4.1 CASH ALLOWANCES

4.1.1 Delete the second sentence in paragraph 4.1.1

4.1.4 Delete paragraph 4.1.4 in its entirety and substitute the following:

Where the actual cost of the *Work* under any cash allowance exceeds the amount of the allowance, any unexpended amounts from other cash allowances shall be reallocated, at the *Consultant's* direction, to cover the shortfall, and, in that case, there shall be no additional amount added to the *Contract Price* for overhead and profit. Only where the actual cost of the *Work* under all cash allowances exceeds the total amount of all cash allowances shall the *Contractor* be compensated for the excess incurred and substantiated, plus an amount for overhead and profit on the excess only, as set out in the *Contract Documents*.

4.1.5 Delete paragraph 4.1.5 in its entirety and substitute the following:

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 *Contract Price* by *Change Order* without any adjustment for the *Contractor's* overhead and profit on such amount.

Add new paragraphs 4.1.8 and 4.1.9 as follows:

4.1.8 The *Owner* reserves the right to call, or to have the *Contractor* call, for competitive bids for portions of the *Work*, which are to be paid for from cash allowances.

4.1.9 Cash allowances cover the net cost to the *Contractor* of services, *Products*, *Construction Equipment*, freight, unloading, handling, storage, installation, provincial sales tax, and other authorized expenses incurred in performing any *Work*

stipulated under the cash allowances but does not include any *Value Added Taxes* payable by the *Owner* and the *Contractor.*

GC 5.1 FINANCING INFORMATION REQUIRED OF THE OWNER

5.1.1 Delete paragraph 5.1.1 in its entirety.

5.1.2 Delete paragraph 5.1.2 in its entirety.

GC 5.2 APPLICATIONS FOR PROGRESS PAYMENT

Delete paragraph 5.2.2 in its entirety and substitute the following:

5.2.2 Applications for payment shall be dated the last day of each payment period, which is the last day of the month or an alternative day of the month agreed in writing by the parties. The amount claimed shall be for the value, proportionate to the amount of the *Contract*, or work performed and *Products* delivered and incorporated into the *Work* at that date. 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.

Each application for payment, except the first, shall include a statutory declaration, in the current CCDC 9A form, up to the date of the application for payment. Each application for payment (including the first the holdback upon Substantial Performance, and final payments), shall also include:

.1 A certificate, issued by an agency or firm providing workers' compensation insurance to the *Contractor*, verifying that coverage is in force at the time of making the application for payment, and that coverage will remain in force for at least sixty (60) days thereafter.

.2 A declaration by the *Contractor* verifying that the performance of the *Work* is in compliance with all applicable regulatory requirements respecting environmental protection, first safety, public safety and occupational health and safety.

.3 A pre-approved schedule of values, supplied by the *Contractor*, for Divisions 1 through 14 of the *Work*, aggregating the total amount of the *Contract Price.*

.4 A separate pre-approved schedule of values, supplied by each *Subcontractor*, for each of Division 15, 16, and 17 of the *Work*, aggregating the total amount of the *Contract Price.*

.5 Invoices to support all claims against the cash allowance.

.6 An acceptable construction schedule pursuant to GC 3.5.

5.2.3 Amend paragraph 5.2.3 by adding the following to the end of that paragraph:

No amount claimed shall include *Products* delivered to the *Place of the Work* unless the *Products* are free and clear of all security interests, liens, and other claims of third parties.

5.2.7 Delete existing paragraph 5.2.7:

Add new paragraphs 5.2.7, and 5.2.8 as follows:

5.2.7 The *Contractor* shall prepare and maintain current as-built drawings which shall consist of the *Drawings* and *Specifications* revised by the *Contractor* during the *Work*, showing changes to the *Drawings* and *Specifications*, which current as-built drawings shall be maintained by the *Contractor* and made available to the *Consultant* for review with each application for progress payment. The *Consultant* shall retain a reasonable amount for the value of the as-built drawings not presented for review.

5.2.8 Prior to each application for payment, the *Contractor* and the *Consultant* shall jointly review the progress of the *Work.*

GC 5.3 PROGRESS PAYMENT

5.3.1.2 In the first sentence amend as follows: After the words "issue to the *Owner*" delete "and copy to the *Contractor*". After the words "after the receipt of the" add "complete".

5.3.1.3 Delete subparagraph 5.3.1.3 in its entirety and substitute as follows:

the *Owner* shall make payment to the *Contractor* on account as provided in Article A-5 of the Agreement – PAYMENT no later than 20 calendar days after the date of a complete certificate of payment is issued by the *Consultant*

Add new paragraphs 5.3.2 and 5.3.3 as follows:

5.3.2 If the *Contractor* fails to provide all documentation as required by GC 5.2 – APPLICATIONS FOR PROGRESS PAYMENT, the *Contractor* or *Owner* shall be entitled to return the application for progress payment to the *Contractor* for completion. The 10 day review period by the *Consultant* and 20 day payment period by the *Owner* will commence upon receipt of a complete application for progress payment.

5.3.3 Payment will be mailed to the *Contractor.* The payment date shall be the date the cheque is mailed. Delay resulting from mail shall not be used in calculating payment date.

GC 5.4 SUBSTANTIAL PERFORMANCE OF THE WORK

5.4.2 Delete paragraph 5.4.2 in its entirety and substitute the following:

The *Consultant* will review the *Work* to verify the validity of the application and shall promptly, and in any event, no later than 30 calendar days after receipt of the *Contractor's* complete deficiency list and application, the *Consultant* shall:

.1 prepare a final deficiency list incorporating all items to be completed or corrected. Each item is to have an indicated value for correction or completion. Determination of the value is defined in GC 5.10 – DEFICIENCY HOLDBACK. The final deficiency list complete with values is to be included with the *Consultant's* draft verification and shall be reviewed with the *Owner* prior to 5.4.2.2.

.2 having completed 5.4.2.1, the *Consultant* shall:
.1 advise the *Contractor* in writing that the *Work* or the designated portion of the *Work* is not substantially performed and give reasons why, or
.2 state the date of *Substantial Performance of the Work* in a certificate and issue a copy of that certificate to each the *Owner* and the *Contractor.*

5.4.3 Delete paragraph 5.4.3 in its entirety and substitute the following:

Following the issuance of the certificate of *Substantial Performance of the Work*, the following shall apply to completing the *Work*:

.1 *Contractor* is to complete the *Work* within sixty (60) calendar days.
.2 No payments will be processed between *Substantial Performance of the Work* and the completion of the *Work*.
.3 The *Owner* reserves the right to contract out any or all unfinished *Work* if it has not been completed within sixty (60) days of *Substantial Performance of the Work* without prejudice to any other right or remedy and without affecting the warranty period. The cost of completing the *Work* shall be deducted from the *Contract Price.*

Add new paragraphs 5.4.4, 5.4.5 and 5.4.6:

5.4.4 Within the time prescribed by the construction/builder's lien legislation in force at the *Place of the Work*, or where there is no legislation or no time prescribed, within a reasonable time of receiving a copy of the certificate of *Substantial Performance of the Work* signed by the *Consultant*, the *Contractor* shall take whatever steps are required to publish or post a signed copy of the certificate, as is required by such legislation. If the *Contractor* fails to comply with this provision, the *Owner* may take the required steps pursuant to the legislation and charge the *Contractor* for any costs so incurred.

5.4.5 Prior to submitting its written application for *Substantial Performance of the Work*, the *Contractor* shall submit to the *Consultant* all:

.1 guarantees;

.2 warranties;
.3 certificates;
.4 final testing and balancing reports;
.5 distribution system diagrams;
.6 spare parts;
.7 maintenance manuals;
.8 samples;
.9 reports and correspondence from authorities having jurisdiction in the *Place of the Work*;
.10 shop drawings;
.11 inspection certificates;
.12 red-lined record drawings from the construction trailer in two copies.

and other materials or documentation required to be submitted under the *Contract*, together with written proof acceptable to the *Owner* and the *Consultant* that the *Work* has been substantially performed in conformance with the requirements of municipal, governmental, and utility authorities having jurisdiction in the *Place of the Work*. The *Consultant* shall refuse to certify *Substantial Performance of the Work* if the submittals referred to in this paragraph 5.4.5 are not provided by the *Contractor*.

5.4.6 The *Owner* shall withhold, from amounts otherwise payable to the *Contractor,* an amount not to exceed one (1) percent of the *Contract Price* as security for the obligation of the *Contractor* to deliver two copies of the red-lined record drawings.

GC 5.5 PAYMENT OF HOLDBACK UPON SUBSTANTIAL PERFORMANCE OF THE WORK

Add new subparagraph 5.5.1.3 as follows

5.5.1.3 submit a statement that no written notices of liens have been received by it

5.5.2 Amend paragraph 5.5.2 by adding the following sentence to the end of that paragraph:

A reserve fund may be retained by the *Owner* to secure the correction of deficiencies and/or warranty claims. Included in the reserve fund would be all *Consultant* and *Owner* costs related to the correction of deficiencies and/or warranty claims.

5.5.3 Delete paragraph 5.5.3 in its entirety.

5.5.5 Delete paragraph 5.5.5 in its entirety.

GC 5.6 PROGRESSIVE RELEASE OF HOLDBACK

Delete GC 5.6 in its entirety.

GC 5.7 FINAL PAYMENT

5.7.1 Delete paragraph 5.7.1 in its entirety and substitute as follows:

When the *Contractor* considers that the *Work* is completed, as defined in the lien legislation applicable to the *Place of the Work* or if such definition does not exist, in accordance with other applicable legislation, industry practice or provisions which may be agreed to between the parties, the *Contractor* shall submit an application for final payment. The *Contractor's* application for final payment shall be accompanied by any documents or materials not yet delivered pursuant to paragraph 5.4.5, together with complete and final as-built drawings and:

.1 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;

.2 a Statutory Declaration CCDC 9A-2001.

The *Work* shall be deemed not to be completed until all of the aforementioned documents have been delivered, and the *Owner* may withhold payment in respect of the delivery of any documents in an amount determined by the *Consultant* in accordance with the provisions of GC 5.8 - WITHHOLDING OF PAYMENT.

5.7.2 Delete from the first line of paragraph 5.7.2 the words, "calendar days" and substitute the words "*Working Days*".

5.7.4 Delete from the second line of paragraph 5.7.4 the words, " 5 calendar days after the issuance" and substitute the words "30 calendar days after receipt of".

GC 5.8 WITHHOLDING OF PAYMENT

Delete paragraph 5.8.1 and replace with the following:

5.8.1 If because of conditions reasonably beyond the control of the *Contractor*, there are items of work that cannot be performed, payment in full for that portion of the *Work* which has been performed as certified by the *Consultant* shall not be withheld or delayed by the *Owner* on account thereof, but the *Owner* may withhold, until the remaining portion of the *Work* is finished, only such an amount that the *Consultant* determines is sufficient and reasonable to cover the cost of performing such remaining work.

GC 5.10 DEFICIENCY HOLDBACK

Add a new General Condition 5.10 as follows:

5.10.1 Notwithstanding any provisions contained in the *Contract Documents* concerning certification and release of monies to the *Contractor*, the *Owner* reserves the right to establish a deficiency holdback, at the time of the review for *Substantial Performance,* based on a 200% dollar value of the deficiencies listed by the *Consultant*. The value of work outstanding for the calculation of *Substantial Performance of the Work* under the *Construction Lien Act* (Ontario) shall utilize the 100% dollar value. No individual deficiency will be valued at less than two hundred dollars ($200.00). The *Owner* shall retain the entire deficiency holdback amount until completion of all of the deficiencies listed by the *Consultant* to the satisfaction of the *Consultant*.

GC 6.1 OWNER'S RIGHT TO MAKE CHANGES

Add new paragraphs 6.1.3, 6.1.4, 6.1.5, 6.1.6, 6.1.7 and 6.1.8 as follows:

6.1.3 The *Contractor* agrees that changes resulting from construction coordination, including but not limited to, site surface conditions, site coordination, and *Subcontractor and Supplier* coordination are included in the *Contract Price* and the *Contractor* shall be precluded from making any claim for a change in the *Contract Price* as a result of such changes.

6.1.4 Labour costs shall be actual, prevailing rates at the *Place of the Work* paid to workers, plus statutory charges on labour including WSIB, unemployment insurance, Canada pension, vacation pay, hospitalization and medical insurance. The *Contractor* shall provides these rates, when requested by the *Consultant*, for review and/or agreement.

6.1.5 Quotations for changes to the *Work* shall be accompanied by itemized breakdowns together with detailed, substantiating quotations or cost vouchers from *Subcontractors* and *Suppliers,* submitted in a format acceptable to the *Consultant* and including any costs associated with extensions in *Contract Time.*

6.1.6 When both additions and deletions covering related *Work* or substitutions are involved in a change to the *Work*, payment, including *Overhead* and profit, shall be calculated on the basis of the net difference, if any, with respect to that change in the *Work*.

6.1.7 No extension to the *Contract Time* shall be granted for changes in the *Work* unless the *Contractor* can clearly demonstrate that such changes significantly alter the overall construction schedule submitted at the commencement of the *Work.* Extensions of *Contract Time* and all associated costs, if approved pursuant to GC 3.4.2, are to be included in the relevant *Change Order.*

6.1.8 When a change in the *Work* is proposed or required, the *Contractor* shall within 10 calendar days submit to the *Consultant* for review a claim for a change in *Contract Price* and/or *Contract Time.* Should 10 calendar days be insufficient to prepare the submission, the *Contractor* shall within 5 calendar days, advise the *Consultant* in writing of the proposed date of submission of the claim. Claims submitted after the dates prescribed herein will not be considered.

GC 6.2 CHANGE ORDER

6.2.1 Add after the last sentence in the paragraph:

The adjustment in the *Contract Time* and the *Contract Price* shall include an adjustment, if any, for delay or for the impact that the change in the *Work* has on the *Work* of the *Contractor*, and once such adjustment is made, the *Contractor* shall be precluded from making any further claims for delay or impact with respect to the change in the *Work.*

Add new paragraph 6.2.3 as follows:

6.2.3 The value of a change shall be determined in one or more of the following methods as directed by the *Consultant*.

.1 by estimate and acceptance of a lump sum;

.2 by negotiated unit prices which include the *Contractor's Overhead* and profit, or;

.3 by the actual cost to the *Owner,* 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:

.1 for *Change Orders* with a value of $0 to $15,000 the total *Subcontractor/Supplier* mark-up including *Overhead* and profit shall be 10% and the total *Contractor* mark-up including overhead and profit shall be 5%.

.2 For *Change Orders* in excess of $15,000, the total *Subcontractor/Supplier* mark-up including *Overhead* and profit shall be 5% and the total *Contractor* mark-up including *Overhead* and profit shall be 3%.

Add new paragraph 6.2.4 as follows:

6.2.4 All quotations will be submitted in a complete manner listing:

.1 quantity of each material,
.2 unit cost of each material,
.3 man hours involved,
.4 cost per hour,
.5 *Subcontractor* quotations submitted listing items 1 to 4 above and item 6 below.
.6 mark-up

Add new paragraph 6.2.5 as follows:

6.2.5 The *Owner* and the *Consultant* will not be responsible for delays to the *Work* resulting from late, incomplete or inadequately broken down valuations submitted by the *Contractor.*

GC 6.3 CHANGE DIRECTIVE

6.3.6.1 Amend paragraph 6.3.6.1 by deleting the final period and adding as follows:

.1 Ten percent (10%) for profit plus five percent (5%) for overhead on work by the *Contractor's* own forces up to the value of $15,000 and five percent (5%) for profit plus three percent (3%) for *Overhead* on work by the *Contractor's* own forces in excess of $15,000 and,

.2 Ten percent (10%) fee on amounts paid to *Subcontractors* or *Suppliers* under subparagraph 6.3.7.9 for changes up to the value of $15,000 and five percent (5%) on changes over $15,000.

Unless a *Subcontractor's* or *Supplier's* price has been approved by the *Owner,* the *Subcontractor* or *Supplier* 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 *Overhead* on such actual net cost for changes in the *Work*, up to the value of $15,000 and five percent (5%) for profit and three percent (3%) for overhead on such actual net cost changes in the *Work* in excess of $15,000.

6.3.6.2 Delete paragraph 6.3.6.2 and replace it with the following:

If a change in the *Work* results in a net decrease in the *Contract Price* in excess of $15,000 the amount of the credit shall be the net cost, with deduction for *Overhead* and profit. If a change in the *Work* results in a net decrease in the *Contract Price* of $15,000 or less, the amount of the credit shall be the net cost, without deduction for *Overhead* or profit.

6.3.7.1 In subparagraph 6.3.7.1 insert "while directly engaged in the work attributable to the change" after the words "in the direct employ of the *Contractor*".

6.3.7 At the end of paragraph 6.3.7 add the following:

All other costs attributable to the change in the *Work* including the costs of all administrative or supervisory personnel are included in *Overhead* and profit calculated in accordance with the provisions of paragraph 6.1.5 of GC6.1 – OWNER'S RIGHT TO MAKE CHANGES.

GC 6.4 CONCEALED OR UNKNOWN CONDITIONS

6.4.1 Delete paragraph 6.4.1 and replace 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* and carried out such tests as it deemed appropriate 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 *Contractor* will be considered by the *Owner* or the *Consultant* in connection with conditions which could reasonably have been ascertained by such investigation or other due diligence undertaken prior to the execution of the *Contract*.

6.4.2 Amend paragraph 6.4.2 by adding a new first sentence as follows:

Having regard to paragraph 6.4.1, if the *Contractor* believes that the conditions of the *Place of the Work* differ materially from those reasonably anticipated, differ materially from those indicated in the *Contract Documents* or were concealed from discovery notwithstanding the conduct of the investigation described in paragraph 6.4.1, it shall provide the *Owner* and the *Consultant* with *Notice in Writing* no later than five (5) *Working Days* after the first observation of such conditions.

Amend the existing second sentence of paragraph 6.4.2 in the second line, following the word "materially" by adding the words "or were concealed from discovery notwithstanding the conduct of the investigation described in paragraph 6.4.1,"

6.4.3 Delete paragraph 6.4.3 in its entirety and substitute the following:

If the *Consultant* makes a finding pursuant to paragraph 6.4.2 that no change in the *Contract Price* or the *Contract Time* is justified, the *Consultant* shall report in writing the reasons for this finding to the *Owner* and the *Contractor*.

Add new paragraph 6.4.5 as follows:

6.4.5 No claims for additional compensation or for an extension of *Contract Time* shall be allowed if the *Contractor* fails to give *Notice in Writing* to the *Owner* or *Consultant,* as required by paragraph 6.4.2.

GC 6.5 DELAYS

6.5.1 Delete the words after the word "for" in the fourth line of paragraph 6.5.1, and add the words "…reasonable direct costs 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)."

6.5.2 Delete the words after the word "for" in the fourth line of paragraph 6.5.2, and add the words "…reasonable direct costs 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)."

6.5.3 Delete paragraph 6.5.3 in its entirety and replace with the following:

If the *Contractor* is delayed in the performance of the *Work* by *Force Majeure*, then the *Contract Time* shall be extended for such reasonable time as the *Consultant* may recommend in consultation with the *Contractor*. The extension of time shall not be less than the time lost as a result of the event causing the delay, unless the *Contractor* agrees to a shorter extension. The *Contractor* shall not be entitled to payment for costs incurred by such delays unless such delays result from the actions of the *Owner.*

Delete paragraph 6.5.4 in its entirety and replace with the following:

6.5.4 No extension or compensation shall be made for delay or impact on the *Work* unless notice in writing of a claim is given to the *Consultant* not later than ten (10) *Working Days* after the commencement of the delays or impact on the *Work*, provided however, that, in the case of a continuing cause of delay or impact on the *Work*, only one notice of claim shall be necessary.

Add new paragraphs 6.5.6, 6.5.7 and 6.5.8 as follows:

6.5.6 If the *Contractor* is delayed in the performance of the *Work* by an act or omission of the *Contractor* or anyone directly or indirectly employed or engaged by the *Contractor,* or by any cause within the *Contractor's* control, then the *Contract Time* may be extended for such reasonable time as the *Owner* may decide in consultation with the *Consultant* and the *Contractor*. The *Owner* shall be reimbursed by the *Contractor* for all reasonable costs incurred by the *Owner* as the result of such delay, including, but not limited to, the cost of all additional services required by the *Owner* from the *Consultant* or any sub-consultants, project managers, or others employed or engaged by the *Owner*, and in particular, the costs of the *Consultant's* services during the period between the date of *Substantial Performance of the Work* 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 *Substantial Performance of the Work* achieved by the *Contractor*.

6.5.7 Without limiting the obligations of the *Contractor* described in GC 3.2 – CONSTRUCTION BY OWNER OR OTHER CONTRACTORS or GC 9.4 – CONSTRUCTION SAFETY, the *Owner* or *Consultant* may, by notice in writing, direct the *Contractor* to stop the *Work* where the *Owner* or *Consultant* determines that there is an imminent risk to the safety of persons or property at the *Place of the Work*. In the event that the *Contractor* receives such notice, it shall immediately stop the *Work* and secure the site. The *Contractor* shall not be entitled to an extension of the *Contract Time* or to an increase in the *Contract Price* unless the resulting delay, if any, would entitle the *Contractor* to an extension of the *Contact Time* or the reimbursement of the *Contractor's* costs as provided in paragraphs 6.5.1, 6.5.2 or 6.5.3.

6.5.8 No claim for delay shall be made and the *Contract Time* shall not be extended due to climatic conditions or arising from the *Contractor's* efforts to maintain the *Contract* schedule.

GC 6.6 CLAIMS FOR A CHANGE IN THE CONTRACT PRICE

Delete GC 6.6 in its entirety.

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

Revise the heading to read **"OWNER'S RIGHT TO PERFORM THE WORK, TERMINATE THE CONTRACTOR'S RIGHT TO CONTINUE WITH THE WORK, SUSPEND THE WORK OR TERMINATE THE CONTRACT"**

Add a new subparagraph 7.1.3.4 as follows:

7.1.3.4 An "acceptable schedule" as referred to in subparagraph 7.1.3.2. means a schedule approved by the *Consultant* and the *Owner* wherein the default can be corrected within the balance of the *Contract Time* and shall not cause delay to any other

aspect of the *Work* or the work of other contractors, and in no event shall it be deemed to give a right to extend the *Contract Time*.

7.1.4.1 Delete sentence and replace with the following:

Correct such default and deduct the cost, including *Owner's* expenses, thereof from any payment then or thereafter due the *Contractor*.

7.1.5.3 In subparagraph 7.1.5.3 delete the words: "however, if such cost of finishing the *Work* is less than the unpaid balance of the *Contract Price*, the *Owner* shall pay the *Contractor* the difference;"

Delete paragraph 7.1.6 in its entirety and add 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 Contract set out herein, the *Owner* may terminate this *Contract* at any time for any other reason and without cause upon giving the *Contractor* fifteen (15) *Working Days Notice in Writing* to that effect. In such event, the *Contractor* shall be entitled to be paid for all *Work* performed including reasonable profit, for loss sustained upon *Products* and *Construction Equipment*, and such other damages as the *Contractor* may have sustained as a result of the termination of the *Contract*, but in no event shall the *Contractor* be entitled to be compensated for any loss of profit on unperformed portions of the *Work*, or indirect, special, or consequential damages incurred.

7.1.7 The *Owner* may suspend *Work* under this *Contract* at any time for any reason and without cause upon giving the *Contractor Notice in Writing* to that effect. In such event, the *Contractor* shall be entitled to be paid for all *Work* 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 *Products* and *Construction Equipment*, and such other damages as the *Contractor* may have sustained as a result of the suspension of the *Work*, but in no event shall the *Contractor* 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 *Contract* 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 *Contract* or a suspension of the *Work* under GC 7.1 - OWNER'S RIGHT TO PERFORM THE WORK, TERMINATE THE CONTRACTOR'S RIGHT TO CONTINUE WITH THE WORK, SUSPEND THE WORK, OR TERMINATE THE CONTRACT or GC 7.2 - CONTRACTOR'S RIGHT TO SUSPEND THE WORK OR TERMINATE THE CONTRACT, the *Contractor* shall use its best commercial efforts to mitigate the financial consequences to the *Owner* arising out of the termination or suspension, as the case may be.

7.1.9 Upon the resumption of the *Work* following a suspension under GC 7.1 - OWNER'S RIGHT TO PERFORM THE WORK, TERMINATE THE CONTRACTOR'S RIGHT TO CONTINUE WITH THE WORK, SUSPEND THE WORK OR TERMINATE THE CONTRACT or GC 7.2 - CONTRACTOR'S RIGHT TO SUSPEND THE WORK OR TERMINATE THE CONTRACT, the *Contractor* will endeavour to minimize the delay and financial consequences arising out of the suspension.

7.1.10 The *Contractor's* obligations under the *Contract* as to quality, correction, and warranty of the *Work* performed by the *Contractor* up to the time of termination or suspension shall continue after such termination of the *Contract* or suspension of the *Work*.

GC 7.2 CONTRACTOR'S RIGHT TO SUSPEND THE WORK OR TERMINATE THE CONTRACT

7.2.3.1 Delete subparagraph 7.2.3.1 in its entirety.

7.2.3.4 In subparagraph 7.2.3.4, delete the words "except for GC 5.1 - FINANCING INFORMATION REQUIRED OF THE OWNER".

Renumber paragraph 7.2.5 as paragraph 7.2.6. Add a new paragraph 7.2.5 as follows:

7.2.5 If the default cannot be corrected within the 5 *Working Days* specified in paragraph 7.2.4, the *Owner* shall be deemed to have cured the default if it:

.1 commences correction of the default within the specified time;

.2 provides the *Contractor* with an acceptable schedule for such correction; and,

.3 completes the correction in accordance with such schedule.

Delete paragraph 7.2.6 entirely and replace with the following:

7.2.6 If the *Contractor* terminates the *Contract* under the conditions described in GC 7.2 – CONTRACTOR'S RIGHT TO SUSPEND THE WORK OR TERMINATE THE CONTRACT, the *Contractor* shall be entitled to be paid for all *Work* performed to the date of termination, as determined by the *Consultant*. The *Contractor* shall also be entitled to recover the direct costs associated with termination, including the costs of demobilization and losses sustained on *Products* and *Construction Equipment*. The *Contractor* shall not be entitled to any recovery for any special, indirect or consequential losses, including loss of profit.

Add new paragraphs 7.2.7, 7.2.8 and 7.2.9 as follows

7.2.7 The *Contractor* shall not be entitled to give notice of the *Owner's* default or terminate the *Contract* in the event the *Owner* withholds certificates or payment or both in accordance with the *Contract* because of:

(a) the *Contractor's* failure to pay all legitimate claims promptly, or
(b) the failure of the *Contractor* to discharge construction liens which are registered against the title to the *Place of the Work.*

7.2.8 The *Contractor's* obligations under the *Contract* as to quality, correction and warranty of the *Work* performed by the *Contractor* up to the effective date of termination shall continue in force and shall survive termination by the *Contractor* in accordance with paragraph 7.2.4.

7.2.9 If the *Contractor* suspends the *Work* or terminates the *Contract* as provided for in GC 7.2 – CONTRACTOR'S RIGHT TO SUSPEND THE WORK OR TERMINATE THE CONTRACT, the *Contractor* shall ensure the site and the *Work* are left in a safe, secure condition as required by authorities having jurisdiction at the *Place of the Work* and the *Contract Documents*.

GC 8.2 NEGOTIATION, MEDIATION AND ARBITRATION

8.2.1 Amend paragraph 8.2.1 by changing part of the second line from "shall appoint a *Project Mediator*" to "may appoint a *Project Mediator,* except that such an appointment shall only be made if both the *Owner* and the *Contractor* agree."

8.2.4 Amend paragraph 8.2.4 by changing part of the second line from "the parties shall request the *Project Mediator"* to "and subject to paragraph 8.2.1 the parties may request the *Project Mediator".*

Delete paragraphs 8.2.6, 8.2.7 and 8.2.8 in their entirety.

Add new paragraph 8.2.6 as follows:

8.2.6 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 *Contractor* and the *Owner* agree. If the *Contractor* and the *Owner* agree to resolve the dispute by arbitration, the arbitration shall be conducted in the jurisdiction of the *Place of the Work.*

GC 9.1 PROTECTION OF WORK AND PROPERTY

Delete subparagraph 9.1.1.1 in its entirety and substitute the following:

9.1.1.1 errors in the *Contract Documents* which the *Contractor* could not have discovered applying the standard of care described in paragraph 3.14.1;

Delete paragraph 9.1.2 in its entirety and substitute as follows:

9.1.2 Before commencing any *Work*, the *Contractor* shall determine the locations of all underground or hidden utilities and structures indicated in or inferable from the *Contract Documents*, or that are inferable from an inspection of the *Place of the Work* exercising the degree of care and skill described in paragraph 3.14.1.

Add new paragraph 9.1.5 as follows:

9.1.5 With respect to any damage to which paragraphs 9.1.3 or 9.1.4 apply, the *Contractor* 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 *Contractor*, without first consulting the *Owner* and receiving written instructions as to the course of action to be followed from either the *Owner* or the *Consultant*. Where, however, there is danger to life, the environment, or public safety, the *Contractor* shall take such emergency action as it deems necessary to remove the danger.

GC 9.2 TOXIC AND HAZARDOUS SUBSTANCES

Add a new subparagraph 9.2.5.5 as follows:

9.2.5.5 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.

9.2.6 Add the following to paragraph 9.2.6, after the word "responsible" in the second line:

…or whether any toxic or hazardous substances or materials already at the *Place of the Work* (and which were then harmless or stored, contained or otherwise dealt with in accordance with legal and regulatory requirements) were dealt with by the *Contractor* or anyone for whom the *Contractor* 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 *Owner* or others,**…**

9.2.8 Add the following to paragraph 9.2.8, after the word "responsible" in the second line:

…or whether any toxic or hazardous substances or materials already at the *Place of the Work* (and which were then harmless or stored, contained or otherwise dealt with in accordance with legal and regulatory requirements) were dealt with by the *Contractor* or anyone for whom the *Contractor* 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 *Owner* or others**,…**

Add new paragraphs 9.2.10 and 9.2.11 as follows:

9.2.10 The *Contractor*, *Subcontractors* and *Suppliers* shall not bring on to the *Place of the Work* any toxic or hazardous substances and materials except as required in order to perform the *Work*. 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 *Place of the Work*.

GC 9.4 CONSTRUCTION SAFETY

Delete paragraph 9.4.1 in its entirety and substitute as follows:

9.4.1 The *Contractor* shall be solely responsible for construction safety at the *Place of the Work* and for compliance with the rules, regulations, and practices required by the applicable construction health and safety legislation and shall be responsible for initiating, maintaining and supervising all safety precautions and programs in connection with the performance of the *Work.*

Add new paragraphs 9.4.2 to 9.4.10 as follows:

9.4.2 Prior to the commencement of the *Work*, the *Contractor* shall submit to the *Owner*:

.1 the evidence of workers' compensation compliance required by GC 10.4.1;

.2 copies of the *Contractor's* insurance policies having application to the *Project* or certificates of insurance, at the option of the *Owner*;

.3 documentation setting out the *Contractor's* in-house safety programs;

.4 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 *Place of the Work*.

9.4.3 The *Contractor* shall indemnify and save harmless the *Owner*, 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 *Contractor* under the occupational health and safety legislation in force at the *Place of the Work* including the payment of legal fees and disbursements on a substantial indemnity basis.

9.4.4 The *Owner* 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 *Contractor* with respect to occupational health and safety and related matters.

9.4.5 If the *Owner* is of the reasonable opinion that the *Contractor* has not taken such precautions as are necessary to ensure compliance with the requirements of paragraph 9.4.1, the *Owner* may take any remedial measures which it deems necessary, including stopping the performance of all or any portion of the *Work,* and the *Owner* may use its employees, the *Contractor*, any *Subcontractor* or any other contractors to perform such remedial measures.

9.4.6 The *Contractor* shall file any notices or any similar document required pursuant to the *Contract* or the safety regulations in force at the *Place of the Work*. This duty of the *Contractor* will be considered to be included in the *Work* and no separate payment therefore will be made to the *Contractor*.

9.4.7 Unless otherwise provided in the *Contract Documents*, the *Contactor* shall develop, maintain and supervise for the duration of the *Work* 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 *Owner* and any workers' compensation or occupational health and safety statutes or regulations in force at the *Place of the Work*.

9.4.8 The Contractor shall provide a copy of the safety program described in paragraph 9.4.7 hereof to the *Consultant* for delivery to the *Owner* prior to the commencement of the *Work*, and shall, ensure, as far as it is reasonably practical to do so, that every employer and worker performing work in respect of the *Project* complies with such program.

9.4.9 The *Contractor* 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 *Place of the Work*, including, without limitation, articles necessary for administering first-aid to any person and an emergency procedure for the immediate removal of any inured person to a hospital or a doctor's care.

9.4.10 The *Contractor* shall promptly report in writing to the *Owner* and the *Consultant* all accidents of any sort arising out of or in connection with the performance of the *Work*, 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 *Contractor* to the *Owner* and the *Consultant* by telephone or messenger in addition to any reporting required under the applicable safety regulations.

GC 10.1 TAXES AND DUTIES

10.1.2 Amend paragraph 10.1.2 by adding the following sentence to the end of the paragraph:

For greater certainty, the *Contractor* shall not be entitled to any mark-up for overhead or profit on any increase in such taxes and duties and the *Owner* shall not be entitled to any credit relating to mark-up for overhead or profit on any decrease in such taxes. The *Contractor* shall provide a detailed breakdown of additional taxes if requested by the *Owner* in a form satisfactory to the Owner.

Add new paragraph 10.1.3 as follows:

10.1.3 Where the *Owner* is entitled to an exemption or a recovery of sales taxes, customs duties, excise taxes or *Value Added Taxes* applicable to the *Contract*, the *Contractor* shall, at the request of the *Owner*, 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 *Owner*. The *Contractor* agrees to endorse over to the *Owner* any cheques received from the federal or provincial governments, or any other taxing authority, as may be required to give effect to this paragraph.

GC 10.2 LAWS, NOTICES, PERMITS, AND FEES

10.2.5 Amend paragraph 10.2.5 by addition the words "Subject to paragraph 3.4" at the beginning of the paragraph. Add the following to the end of the second sentence:

…and no further *Work* on the affected components of the *Contract* shall proceed until these directives have been obtained by the *Contractor* from the *Consultant*.

10.2.6 Amend paragraph 10.2.6 by adding the following sentence to the end of the paragraph:

In the event the *Owner* suffers loss or damage as a result of the *Contractor's* failure to comply with paragraph 10.2.5 and notwithstanding any limitations described in paragraph 12.1.1, the *Contractor* agrees to indemnify and to hold harmless the *Owner* and the *Consultant* from and against any claims, demands, losses, costs, damages, actions suits or proceedings resulting from such failure by the *Contractor*.

Add new paragraph 10.2.8 as follows:

10.2.8 The *Contractor* shall furnish all certificates that are required or given by the appropriate governmental authorities as evidence that the *Work* as installed conforms with the laws and regulations of authorities having jurisdiction, including certificates of compliance for the *Owner's* occupancy or partial occupancy. The certificates are to be final certificates giving complete clearance of the *Work*, in the event that such governmental authorities furnish such certificates.

GC 10.4 WORKERS' COMPENSATION

10.4.1 Delete paragraph 10.4.1 and replace with the following:

Prior to commencing the *Work*, and with each and every application for payment thereafter, including the *Contractor's* application for payment of the holdback amount following *Substantial Performance of the Work* and again with the *Contractor's* application for final payment, the *Contractor* shall provide evidence of compliance with workers' compensation legislation in force at the *Place of the Work*, including payments due thereunder.

GC 11.1 INSURANCE

Delete entirety of general condition and CCDC 41 and replace with the following**:**

11.1 Without restricting the generality of GC 12 – INDEMNIFICATION, the *Contractor* 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 *Work* until the expiration of the warranty periods set out in the *Contract Documents*. Prior to commencement of the *Work* and upon the placement, renewal, amendment, or extension of all or any part of the insurance, the *Contractor* shall promptly provide the *Owner* 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 amending endorsements.

.1 **General Liability Insurance**

General liability insurance shall be in the name of the *Contractor,* with the *Owner* and the *Consultant* named as additional insureds, with limits of not less than $5,000,000.00 inclusive per occurrence for bodily injury, death, and damage to

property, including loss of use thereof, for itself and each of its employees, *Subcontractors* and/or agents. The insurance coverage shall not be less than the insurance required by IBC Form 2100, or its equivalent replacement, 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 *Substantial Performance of the Work*, as set out in the certificate of *Substantial Performance of the Work,* on an ongoing basis for a period of 6 years following *Substantial Performance of the Work*. Where the *Contractor* maintains a single, blanket policy, the addition of the *Owner* and the *Consultant* is limited to liability arising out of the *Project* and all operations necessary or incidental thereto. The policy shall be endorsed to provide the *Owner* with not less than 30 days' notice, in writing, in advance of any cancellation and of change or amendment restricting coverage.

.2 **Automobile Liability Insurance**

Automobile liability insurance in respect of licensed vehicles shall limits of not less than $2,000,000.00 inclusive per occurrence for bodily injury, death and damage to property, covering all licensed vehicles *owned* or leased by the *Contractor*, and endorsed to provide the *Owner* with not less than 30 days' notice, in writing, in advance of any cancellation, change or amendment restricting coverage. Where the policy has been issued pursuant to a government-operated automobile insurance system, the *Contractor* shall provide the *Owner* with confirmation of automobile insurance coverage for all automobiles registered in the name of the *Contractor.*

.3 **Aircraft and Watercraft Liability Insurance [NTD: This can come out if N/A]**

Where determined necessary by the *Contractor*, 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-owed aircraft and watercraft if used directly or indirectly in the performance of the *Work*, including use of additional 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 *Owner*. The policies shall be endorsed to provide the *Owner* with not less than 30 days' notice, in writing, in advance of cancellation, change or amendment restricting coverage.

.4 Property and Boiler and Machinery Insurance

(1) Builder's Risk property insurance shall be in the name of the *Contractor* with the *Owner* and the *Consultant* named as additional insureds. The policy shall insure against all risks of direct physical loss or damage to the property insured which shall include all property included in the *Work*, whether owned by the *Contractor* or the owner or owned by others, so long as the property forms part of the *Work*. 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 replacement provided that the IBC Form 4042 shall include the latest addition 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.

(2) Boiler and machinery insurance shall be in the name of the *Contractor*, with the *Owner* and the *Consultant* named as additional insureds, for not less than the replacement value of the boilers, pressure vessels and other insurable objects forming part of the *Work*. 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.

(3) The policies shall allow for partial or total use or occupancy of the *Work.*

(4) The policies shall provide that, in the case of a loss or damage, payment shall be made to the *Owner* and the *Contractor* as their respective interests may appear. The *Contractor* shall act on behalf of the *Owner* 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 *Contractor* shall proceed to restore the *Work*. Loss or damage shall not affect the rights and obligations of either party under the *Contract* except that the *Contractor* shall be entitled to such reasonable extension of the *Contract Time,* relative to the extent of the loss or damage, as determined by the *Owner*, in its sole discretion.

(5) The *Contractor* shall be entitled to receive from the *Owner*, in addition to the amount due under the *Contract*, the amount at which the *Owner's* interest in restoration of the *Work* has been appraised, such amount to be paid as the restoration of the *Work* proceeds and as provided in GC 5.2 – APPLICATIONS FOR PROGRESS PAYMENT and GC 5.3 – PROGRESS PAYMENT. In addition, the *Contractor* shall be entitled to receive from the payments made by the insurer the amount of the *Contractor's* interest in the restoration of the *Work*.

(6) In the case of loss or damage to the *Work* arising from the work of other contractors, or the *Owner's* own forces, the *Owner*, in accordance with the *Owner's* obligations under paragraph 3.2.2.4 of GC 3.2 – CONSTRUCTION BY OWNER OR OTHER CONTRACTORS, shall pay the *Contractor* the cost of restoring the *Work* as the restoration of the *Work* proceeds and as provided in GC 5.2 – APPLICATIONS FOR PROGRESS PAYMENT and GC 5.3 – PROGRESS PAYMENT.

.5 Contractors' Equipment Insurance

"All risks" contractors' equipment insurance covering construction machinery and equipment used by the *Contractor* for the performance of the *Work*, excluding boiler insurance, shall be in a form acceptable to the *Owner* and shall not allow subrogation claims by the insurer against the *Owner.* The policies shall be endorsed to provide the *Owner* with not less than 30 days' notice, in writing, in advance of cancellation, change or amendment restricting coverage. Subject to satisfactory proof of financial capability by the *Contractor* for self-insurance of his equipment, the *Owner* agrees to waive the equipment insurance requirement.

11.1.2 The *Contractor* shall be responsible for deductible amounts under the policies except where such amounts may be excluded from the *Contractor's* responsibility by the terms of GC 9.1 - PROTECTION OF WORK AND PROPERTY and GC 9.2 - DAMAGES AND MUTUAL RESPONSIBILITY.

11.1.3 Where the full insurable value of the *Work* is substantially less than the *Contract Price*, the *Owner* may reduce the amount of insurance required to waive the course of construction insurance requirement.

11.1.4 If the *Contractor* fails to provide or maintain insurance as required by the *Contract Documents*, then the *Owner* shall have the right to provide and maintain such insurance and provide evidence of same to the *Contractor*. The *Contractor* shall pay the costs thereof to the *Owner* on demand, or the *Owner* may deduct the amount that is due or may become due to the *Contractor*.

11.1.5 All required insurance policies shall be with insurers licensed to underwrite insurance in the jurisdiction of the *Place of the Work*.

GC 11.2 CONTRACT SECURITY

11.2.2 Delete paragraph after the word "provided" and replace with the following:

Such bonds shall be issued by a duly licensed surety company, which has been approved by the *Owner*, authorized to transact a business of suretyship in the province or territory of the *Place of the Work* and shall be maintained in good standing until the fulfillment of the *Contract*, including all warranty and maintenance periods set out in the *Contract Documents.*

Add new paragraph 11.2.3 as follows:

11.2.3 It is the intention of the parties that the performance bond shall be applicable to all of the *Contractor's* obligations in the *Contract Document* and, wherever a performance bond is provided with language which conflicts with this intention, it shall be deemed to be amended to comply. The *Contractor* represents and warrants to the *Owner* that it has provided its surety with a copy of the *Contract Documents* prior to the issuance of such bonds.

GC 12.1 INDEMNIFICATION

Delete General Condition 12.1 – INDEMNIFICATION in its entirety and substitute as follows:

12.1.1 The *Contractor* shall indemnify and hold harmless the *Owner*, its parent, subsidiaries and affiliates, their respective partners, trustees, officers, directors, agents and employees and the *Consultant* 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 *Owner* 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 *Contractor*, its employees, agents, *Subcontractors*, *Suppliers* 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 *Work*, the *Owner's* property or equipment, the *Contractor's* property or equipment or equipment or property adjacent to the *Place of the Work* or death or injury to the *Contractor's* personnel).

12.1.2 The provisions of GC 12.1 - INDEMNIFICATION shall survive the termination of the *Contract,* 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 *Work* shall constitute a waiver or release of any of the provisions of GC 12.1.

GC 12.2 WAIVER OF CLAIMS

12.2.1 In the fourth line, add the words "claims for delay pursuant to GC 6.5 DELAYS" after the word "limitation". Add the words "(collectively "Claims")" after "*Substantial Performance of the Work*" in the sixth line.

12.2.1.1 Change the word "claims" to "Claims" and change the word "claim" to "Claim".

12.2.1.2 Change the word "claims" to "Claims".

12.2.1.3 Delete paragraph in its entirety.

12.2.1.4 Change the word "claims" to "Claims".

12.2.2 Change the words "in paragraphs 12.2.1.2 and 12.2.1.3" to "in paragraph 12.2.1.2".Change the word "claims" to "Claims" in both instances and change the word "claim" to "Claim".

12.2.3 Delete paragraph in its entirety.

12.2.4 Delete paragraph in its entirety.

12.2.5 Delete paragraph in its entirety.

12.2.6 Change the word "claim" to "Claim" in all instances in the paragraph.

12.2.7 Change "The party" to "The *Contractor*. Change the word "claim" to "Claim" in all instances in the paragraph.

12.2.8 Change "under paragraphs 12.2.1 or 12.2.3" to "under paragraph 12.2.1". Change both instances of the words "the party" to "the *Contractor*". Change the word "claim" to "Claim" in all instances in the paragraph.

12.2.9 Delete paragraph 12.2.9 in its entirety.

12.2.10 Delete paragraph 12.2.10 in its entirety.

GC 12.3 WARRANTY

12.3.2 Delete from the first line of paragraph 12.3.2 the word, "The" and substitute the words "Subject to paragraph 3.4.1, the…"

Add new paragraphs 12.3.7 to 12.3.12 as follows:

12.3.7 Where required by the *Contract Documents*, the *Contractor* shall provide a maintenance bond as security for the performance of the *Contractor's* obligations as set out in GC 12.3 WARRANTY.

12.3.8 The *Contractor* shall provide fully and properly completed and signed copies of all warranties and guarantees required by the *Contract Documents*, containing:

.1 the proper name of the *Owner*;
.2 the proper name and address of the *Project*;
.3 the date the warranty commences, which shall be at the "date of *Substantial Performance of the Work*" unless otherwise agreed upon by the *Consultant* in writing.
.4 a clear definition of what is being warranted and/or guaranteed as required by the *Contract Documents*; and
.5 the signature and seal (if required by the governing law of the *Contract*) of the company issuing the warranty, countersigned by the *Contractor*.

12.3.9 Should any *Work* 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.

12.3.10 The *Contractor* shall ensure that its *Subcontractors* are bound to the requirements of GC 12.3 – WARRANTY for the *Subcontractor's* portion of the *Work.*

12.3.11 The *Contractor* shall ensure that all warranties, guarantees or other obligations for *Work*, services or *Products* performed or supplied by any *Subcontractor, Supplier* or other person in connection with the *Work* are obtained and available for the direct benefit of the *Owner.* In the alternative, the *Contractor* shall assign to the *Owner* all warranties, guarantees or other obligations for *Work*, services or *Products* performed or supplied by any *Subcontractor, Supplier* or other person in connection with the *Work* 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 *Owner* under the *Contract Documents*.

12.3.12 The *Contractor* shall commence or correct any deficiency within 2 Working Days after receiving a notice from the *Owner* or the *Consultant*, and shall complete the *Work* 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 *Owner* 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 *Contractor* fail to provide this emergency service within 8 hours of a request being made during the normal business hours of the *Contractor*, the *Owner* is authorized, notwithstanding GC 3.1, to carry out all necessary repairs or replacements at the *Contractor's* expense.

PART 13 OTHER PROVISIONS

Add new Part 13 OTHER PROVISIONS as follows:

GC 13.1 OWNERSHIP OF MATERIALS

13.1.1 Unless otherwise specified, all materials existing at the *Place of the Work* at the time of execution of the *Contract* shall remain the property of the *Owner*. All *Work* and *Products* delivered to the *Place of the Work* by the *Contractor* shall be the property of the *Owner.* The *Contractor* shall remove all surplus or rejected materials as its property when notified in writing to do so by the *Consultant*.

GC 13.2 CONSTRUCTION LIENS

13.2.1 In the event that a claim for lien is registered against the *Project* by a *Subcontractor, Sub-subcontractor* or *Supplier*, and provided the *Owner* has paid all amounts properly owing under the *Contract*, the *Contractor* shall, at its own expense:

.1 within 10 calendar days, ensure that any and all claims for lien and certificates of action are discharged, released, or vacated by the posting of security or otherwise; and

.2 in the case of written notices of lien, ensure that such notices are withdrawn, in writing.

13.2.2 In the event that the *Contractor* fails to conform with the requirements of paragraph 13.2.1, the *Owner* may fulfil those requirements without *Notice in Writing* to the *Contractor* and set off and deduct from any amount owing to the *Contractor*, all costs and associated expenses, including the costs of posting security and all legal fees and disbursements associated

with discharging or vacating the claim for lien or certificate of action and defending the action. If there is no amount owing by the *Owner* to the *Contractor*, then the *Contractor* shall reimburse the *Owner* for all of the said costs and associated expenses.

13.2.3 Notwithstanding any other provision in the *Contract*, the *Consultant* shall not be obligated to issue a certificate and the *Owner* shall not be obligated to make payment to the *Contractor* if, at the time such certificate or payment was otherwise due:

.1 a claim for lien has been registered against the *Project* lands, or

.2 if the *Qwner* or mortgagee of the *Project* lands has received written notice of a lien.. or

.3 the *Owner* or *Consultant* reasonably believe that any party has purported to retain title to *Products* or materials in respect of which an application for payment has been made.

13.2.4 Without limiting the foregoing, the *Contractor* shall, if requested by the *Owner*, defend, indemnify and save the *Owner* harmless from the amount of all such claims and the costs of defending any and all actions commenced against the *Owner* pursuant to the construction/builder's lien legislation in force at the *Place of the Work*, including the legal costs of the *Owner*, unless the lien was a direct result of a breach of the *Contract* by the *Owner* or the non-payment by the *Owner* of a valid charge or claim under the *Contract*.

13.2.5 GC 13.2 – CONSTRUCTION LIENS does not apply to construction/builder's liens claimed by the *Contractor.*

END OF AMENDMENTS TO CCDC 2 - 2008

INCENTIVE APPLICATION CHECK LIST

Please ensure that the following information is submitted to the Waterloo Catholic District School Board:

1. **Energy Efficient Equipment:** To be eligible for an incentive, all proposed equipment has to have an **ENERGY STAR or DLC label** on it.
2. **Proposed Equipment:** Submit proposed equipment including: spec sheets and quantities per equipment type. Documentation must include: make and model of equipment such as motors, roof top units, chillers, VFDs, lamp, and ballast etc.
3. **Initial Quote:** Initial quote and any additional invoices must reflect the proposed equipment and should include a detailed breakdown of the equipment proposed to be installed, quantity per equipment type, and equipment and labor costs. The invoice also has to include the make and model number, and type of proposed equipment as shown in the *"Initial Quote (Proposed Equipment)"* form.
4. **Equipment Disposal and Decommissioning:** The intent of this procedure is to remove the old equipment from the system thereby realize the energy savings provided by the new or retrofitted material. The existing equipment that is being retrofitted **must not** be disposed of in the landfill.

   The Contractor must submit written proof or evidence or acknowledgement that the disposal of all materials was done so in accordance with all current disposal requirements (see attached). Acceptable Documents: Invoices OR Disposal Certificates OR Disposal Declaration Form. This documentation must be on the disposal facility's letterhead or invoice, or the Contractor's letterhead or invoice. The Disposal Certificate/ Invoice/ Declaration must indicate the total number of old equipment.

   Note: During the construction phase, some of the equipment (e.g., bulbs, lamps, ballasts etc.) when removed might break and will not be recyclable. It is important that the number of total recycled equipment and the total number of broken equipment is noted on the disposal certificate.

5. **Confirmation:** The Contractor will take all necessary steps to have equipment that was removed or replaced as part of any Work disposed of or decommissioned in accordance with appropriate disposal or decommissioning processes, applicable laws, and in accordance with commercially reasonable environmental practices.

Initial Quote (Proposed Equipment)

Date:			
School Board:			
School Name:			
School Address:			
List of proposed equipment:			
Product name *(e.g., lamp, ballast, boiler, heat pump, roof top units, etc.)*	**Quantity**	**Model number and Manufacturer**	**Cost Breakdown for equipment & labor**
Example: Lamps	*30 lamps*	*Sylvania F032/841/ECO*	*Equipment: $2,000 Labor: $1,000*

Disposal Declaration Form

Date:	
School Board:	
School Name:	
School Address:	
Application #:	
LDC#:	
ISEO#:	

Equipment	**Quantity**	**Comments**
Lighting example: *Manufacturer: Sylvania* *Model #: F032/841/ECO* *Wattage: 32W*	*# of fixtures: 15* *# of lamps: 30*	
(Modify as required) Manufacturer: Model #: Wattage:		
(Modify as required) Manufacturer: Model #: Wattage:		

Disposal Facility:	
Contractor Company Name:	
Name and Title:	
Signature:	

The undersigned Contractor warrants that they have taken all necessary steps to dispose of equipment that was removed or replaced (listed below) as part of this Retrofit Program Application in accordance with appropriate disposal or decommissioning processes, applicable laws, and in accordance with commercially reasonable environmental practices.

Dwg. No.	Title	Issue No.	Rev. No.	Issue Date
A000	Drawing List, OBC Matrix & Location Map	2	-	October 29, 2021
ARCHITECTURAL				
A201	Overall Demolition & New Basement Plans	2	-	October 29, 2021
A202	Overall Existing & Demolition Ground Floor Plan	2	-	October 29, 2021
A203	Overall Existing & Demolition Second Floor Plan	2	-	October 29, 2021
A204	Overall Existing & Demolition Third Floor Plan	2	-	October 29, 2021
A205	Overall Roof & Penthouse Plan	1	-	October 29, 2021
A206	Enlarged Demolition Floor Plans	2	-	October 29, 2021
A207	Enlarged Washroom & Janitor Room Demolition Plans	1	-	October 29, 2021
A208	Enlarged Floor Plans	2	-	October 29, 2021
A209	Enlarged Washroom & Janitor Room Plans	2	-	October 29, 2021
A210	Enlarged Reflected Ceiling Plans	1	-	October 29, 2021
A301	Exterior Elevations	2	-	October 29, 2021
A302	Exterior Elevations	2	-	October 29, 2021
A601	Details & Lift Sections	1	-	October 29, 2021
A701	Interior Elevations – Washrooms & Janitor	1	-	October 29, 2021
A702	Interior Elevations – Washrooms & Janitor	1	-	October 29, 2021
A801	Millwork Details	1	-	October 29, 2021
A802	Millwork Details	1	-	October 29, 2021
A803	Millwork Details	1	-	October 29, 2021
A901	Door Schedule	2	-	October 29, 2021
A902	Finish Schedule	2	-	October 29, 2021
STRUCTURAL				
S101	General Notes, Schedules & Plans	1	-	October 27, 2021
S201	Roof Framing Plan, Details & General Notes	1	-	October 27, 2021
S501	Sections & Details	1	-	October 27, 2021
MECHANICAL				
ME-0.1	Mechanical Electrical Schedules 1	-	00	October 27, 2021
M-0.1	Mechanical Details	-	00	October 27, 2021
M-0.2	Mechanical Plumbing Details	-	00	October 27, 2021
M-0.3	Mechanical Plumbing Details 2	-	00	October 27, 2021

Dwg. No.	Title	Issue No.	Rev. No.	Issue Date
M-B.0	Basement Plan Mechanical Overview	-	00	October 27, 2021
M-1.0	First Floor Plan – Mechanical Overview and Hot Water Heating	-	00	October 27, 2021
M-1.1	First Floor Plan – HVAC and Sprinkler Demolition	-	00	October 27, 2021
M-1.2	First Floor Plan – Plumbing Demolition	-	00	October 27, 2021
M-1.3	First Floor Plan – HVAC & Sprinklers	-	00	October 27, 2021
M-1.4	First Floor Plan - Plumbing	-	00	October 27, 2021
M-2.0	Second Floor Plan – Mechanical Overview	-	00	October 27, 2021
M-2.1	Second Floor Plan – Mechanical Demolition	-	00	October 27, 2021
M-2.2	Second Floor Plan – HVAC and Plumbing	-	00	October 27, 2021
M-3.0	Third Floor Plan – Mechanical Overview	-	00	October 27, 2021
M-3.1	Third Floor Plan – Mechanical Demolition	-	00	October 27, 2021
M-3.2	Third Floor Plan – HVAC and Plumbing	-	00	October 27, 2021
M-4.0	Roof Floor Plan – Mechanical Overview	-	00	October 27, 2021
M-4.1	Roof Floor Plan – HVAC and Plumbing	-	00	October 27, 2021
ELECTRICAL				
ME-0.1	Mechanical & Electrical Schedules	1	-	October 27, 2021
E-0.1	Electrical Legend, Schedules & Details	1	-	October 27, 2021
E-0.2	Electrical Panel Schedules & Details	1	-	October 27, 2021
E-0.3	Electrical Specifications (1 of 2)	1	-	October 27, 2021
E-0.4	Electrical Specifications (2 of 2)	1	-	October 27, 2021
E-B.0	Basement Floor Plan – Electrical Demolition	1	-	October 27, 2021
E-B.0	Basement Floor Plan – Electrical Construction	1	-	October 27, 2021
E-1.0	Ground Floor Plan – Electrical Demolition	1	-	October 27, 2021
E-1.1	West Wing Ground Floor – Power & Systems	1	-	October 27, 2021
E-1.2	East Wing Ground Floor Plan – Power & Systems	1	-	October 27, 2021
E-1.3	Ground Floor Plan - Lighting	1	-	October 27, 2021
E-2.0	2nd Floor Plan – Washrooms Electrical	1	-	October 27, 2021
E-2.1	2nd Floor Plan – Classrooms Electrical	1	-	October 27, 2021
E-3.0	3rd Floor Plan – Washrooms Electrical	1	-	October 27, 2021
E-3.1	3rd Floor Plan – Classrooms Electrical	1	-	October 27, 2021
E-4.0	4th Floor & Roof Plan - Electrical	1	-	October 27, 2021

End of Section

PART 1 GENERAL

1.1 Section Includes

.1 Work covered by contract documents
.2 Owner
.3 Location of the site
.4 Scheduling requirements
.5 Site access
.6 Work sequence
.7 Contractor use of premises
.8 Engineer design
.9 Hazardous material discovery
.10 Building smoking environment
.11 Special conditions
.12 Site security
.13 “By Others”
.14 Protection of Drawings

1.2 Work Covered by Contract Documents

.1 Work of this Contract comprises the Phase 2 - Interior Renovations at St Louis Main Campus, and as indicated on the drawings and specifications.

1.3 Owner

.1 Waterloo Catholic District School Board

1.4 Location of Site

.1 The Work of this Contract is located at 80 Young Street, Kitchener, Ontario.

1.5 Scheduling Requirements

.1 Work to be coordinated with the School Board.

1.6 Metric Project

.1 This project is to be based on The International System of Units (SI). Measurements are expressed in metric (SI) units.

.2 All dimensions are to be shown in meters and millimeters.

1.7 Site Access

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

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

.3 Provide secure construction fencing as specified and where indicated.

1.8 Work Sequence

.1 Construct Work continuously.

1.9 Contractors Use of Premises

.1 Contractor has unrestricted use of site until Substantial Performance.

1.10 Engineer Design

.1 Where specifications require work to be designed by an engineer, engage an engineer licensed in the Province of Ontario to design such work. Refer to Section 01 78 00.

1.11 Hazardous Material Discovery

.1 Refer to Designated Substances Audit Report prepared by MTE Consultants May 25 2021 attached within this document for known hazardous materials and designated substances.

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

1.12 Verification

.1 All dimensions shall be verified on site, and all necessary modifications and adjustments shall be made as necessary to suit.

1.13 Building Smoking Environment

.1 Smoking and vaping are prohibited in all workplaces within the Owner's buildings and on the Owner's property.

1.14 Special Conditions

.1 The following general and special conditions apply:
  .1 All existing surfaces and finishes are to be repaired wherever damaged during the course of the Work.
  .2 Wherever existing ceramic or quarry tile floor and wall finishes are to be removed, include full removal down to the existing concrete substrate of all tile, base, mortars, grouts, waterproofing membranes and adhesives in accordance with TTMAC recommended procedures. Patch and repair existing substrate to the quality required by the new finish material manufacturer for the installation of their products.
  .3 All openings in existing fire rated assemblies or fire separations which are created by the removal of existing services, plumbing, conduit, ductwork, fittings fixtures or accessories are to be firestopped to maintain the integrity of the existing construction.
  .4 All exposed interior surfaces except prefinished surfaces shall be painted whether referred to in the specifications and drawings or not.

1.15 Site Security

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

1.16 "By Others"

.1 The term "by others" where it is used in the contract documents means that work shown or described in the contract documents and labeled with this designation is not included in the specific sub-trade's scope of work but will be required to be done within the General Contractor's contract.

1.17 Use of Drawings

.1 Drawings are not to be scaled.

.2 Copies of architectural and structural "issued for construction" drawings in digital format will be made available for the contractors use under the following conditions.
- .1 BBA is paid an agreed fee for architectural and structural drawings. The fee for this project is $1,000.00.
- .2 Copyright remains with BBA.
- .3 The drawings will only be used for shop drawings for this project and not be put to any other use.
- .4 BBA assumes no liability for errors or omissions in the drawings. The Contractor assumes all risk and expenses associated with the use of drawings in the production of his work.
- .5 References to BBA and other Consultants must be deleted from the title block.
- .6 The Contractor signs a release available from BBA that addresses the above items in more detail. (Sample attached as Appendix 'A')

.3 Arrangements for use of sub-consultant drawings must be made with the appropriate sub-consultant.

1.18 Protection of Drawings

.1 Copyright of electronic document belongs to the Consultant. Electronic documents may not be forwarded to others, transmitted, downloaded or reproduced in any format, whether print or electronic, without the express, written permission of the copyright owner.

.2 Drawings, specifications and other contract related documents which are posted on Contractor controlled websites for access by sub-trades and suppliers, shall be posted only on password protected and secure websites approved by the Consultant to limit access to those with an expressed interest in the Project.

.3 Provide Consultant and Owner with access to such websites as noted above.

PART 2 PRODUCTS

3.1 Not Used

.1 Not used

PART 3 EXECUTION

3.2 Not Used

.1 Not used

End of Section

SAMPLE

[DATE]

[CONTRACTOR'S COMPANY

ADDRESS

CITY, PROVINCE, POSTAL CODE]

Attention: [INSERT CONTACT NAME]

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

Our electronic files are compatible with [AutoCAD 2000/2004 (**)]. We make no representation as to the compatibility of these files with your hardware or your software beyond the specified release of the referenced specifications.

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

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

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

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

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

We will furnish you electronic files upon your written request.

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

_____	_____
Barry Bryan Associates	[CONTRACTOR FIRM NAME]

PART 1 GENERAL

1.1 Section Includes

.1 Cash Allowances

1.2 References

.1 Canadian Construction Documents Committee CCDC2-2008 Stipulated Price Contract including the Supplementary Conditions.

1.3 Cash Allowances

.1 Refer to General Conditions, GC4.1.

.2 Unless otherwise specified, Cash Allowances shall cover the cost of the materials and equipment delivered F.O.B. job site, and all applicable taxes, except Harmonized Sales Tax. The Contractor's handling costs on the site, labour, installation costs, overhead and profit and other expenses shall be included separately in the Stipulated Price and not in the Cash Allowance.

.3 Where it is specified that a Cash Allowances is to include both supply and installation costs, such allowances shall cover the cost of the materials and equipment delivered and unloaded at the site, all applicable taxes and the contractor’s handling costs on the site, labour and installation costs and other expenses, except overhead and profit which shall be included separately in the Stipulated Price.

.4 If the cost of the Work covered by Cash Allowances, when determined, is more or less than the allowance, the Contract Sum shall be adjusted accordingly.

.5 In the event that the cost of the work covered by Cash Allowances should exceed the cash allowance, while the contract sum will be adjusted in conformity therewith, there shall be no adjustment to the Contractor's fee or other expenses such as overhead or profit, it being understood and agreed that the contract sum includes the Contractor's expenses and profit for all Cash Allowances whether or not they are exceeded.

.6 Progress payments on accounts of work authorized under Cash Allowances shall be included in monthly certificate for payment.

.7 Expenditures from Cash Allowances shall be authorized by Change Directive or Change Order.

.8 Cash Allowance for independent inspection and testing shall cover the cost of such services as provided by independent testing agency only. The Contractor's cost for labour, overhead and other expenses related to independent inspection and testing shall be included separately in the Stipulated Price and not in the Cash Allowance.

.9 Cause the work covered by Cash Allowances to be performed for such amounts and by such persons as the Consultant may select and direct or as required by the project drawings and specifications.

.10 Refer to Instructions to Bidders, with respect to Cash Allowances Value(s) for the items listed below:
   .1 BAS Upgrade
   .2 Door Hardware

.3 Terrazzo Floor Repair Work
.4 Testing & Inspections
.5 Interior Signage (Supply and Install)
.6 Data & Security
.7 Abatement (Designated Substance Report)
.8 Miscellaneous Metals Repairs (Exterior)

PART 2 PRODUCTS

2.1 Not Used

.1 Not used

PART 3 EXECUTION

3.1 Not Used

.1 Not used

End of Section

PART 1 GENERAL

1.1 Section Includes

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

1.2 Definitions

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

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

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

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

1.3 Subcontractor Procedures

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

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

1.4 Substitutions – Products

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

1.5 Substitutions – Manufacturers

.1 Substitute Manufacturers: Where substitute manufacturers are permitted, unnamed manufacturers will be accepted by the Consultant, subject to the following:
.1 Substitute manufacturers shall have capabilities comparable to those of the named manufacturers.

.2 In making a substitution Contractor and the Subcontractor represents that they have:
.1 Investigated substitute product or manufacturer, or both, and determined it meets or exceeds the criteria of the specified product, and;
.2 Will provide the same warranty for the Substitution as for the specified product.
.3 Will make any changes to the Work necessitated by substitution as required for Work to be complete in all respects, and;
.4 Waives claims for additional costs and time caused by substitution which may subsequently become apparent.
.5 Will reimburse Consultant's services for review or redesign, additional studies, investigations, review of submittals, and associated contract administration.
.6 Received necessary approvals of authorities having jurisdiction.
.7 Investigated the proposed substitute to determine if license fees and royalties are pending.
.8 If accepted, the substitution will not adversely affect the Construction Schedule.

.3 Do not order or install requested Substitutions without Consultant's acceptance.

.4 If, in the Consultant's opinion, a substitution does not meet requirements of Contract Documents, Subcontractor shall, at no extra cost to Owner, provide a product which, in the Consultant's opinion, does meet requirements of Contract Documents.

1.6 Proprietary Specifications

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

1.7 Changes to Accepted Products and Manufacturers

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

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

1.8 Product Data

.1 When requested by the Consultant, submit complete data substantiating compliance of a product with requirements of Contract Documents. Include the following:
.1 Product identification, including manufacturer's name and address.
.2 Manufacturer's literature providing product descriptions, applicable reference standards, performance and test data, in form consistent with the Contract Documents and readily comparable with product being substituted and can provide the specified and indicated requirements.
.3 Samples, as applicable.
.4 Name and address of projects on which product has been used and date of each installation.

.5 Itemized comparison of substitution with named product(s). List significant variations.
.6 Designation of availability of maintenance services and sources of replacement materials
.7 Completed Substitutions Request Form. Incomplete forms will be rejected.

1.9 Consultant Procedure

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

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

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

1.10 Contractor Procedure

.1 Contractor will review Request for Substitution (RFS) form and accept or reject substitution.

.2 Contractor to sign and date RFS.

.3 Such acceptance from the Contractor shall not relieve Subcontractor from complying with the requirements of the Drawings and Specifications.

.4 Subcontractor shall be responsible for costs of changes resulting from Subcontractor's proposed substitutions which affect other parts of the Work.

PART 2 PRODUCTS

2.1 Not Used

.1 Not used

PART 3 EXECUTION

3.1 Not Used

.1 Not used

End of Section

PART 1 GENERAL

1.1 Section Includes

.1 Requests for Information
.2 Submittal procedures
.3 Screening of RFI's
.4 Response to RFI's
.5 Response Timing

1.2 Request for Information (RFI)

.1 A request for information (RFI) is a formal process used during the Work to obtain an interpretation of the Contract Documents or to obtain additional information.

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

1.3 Submittal Procedures

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

.2 Number RFI's consecutively in one sequence in order submitted, in numbering system as established by the Contractor.

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

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

.5 RFI log:
.1 Maintain log of RFI's sent to and responses received from the Consultant, complete with corresponding dates.
.2 Submit updated log of RFI's at each construction meeting and with each application for payment submission.

.6 Submit RFI's sufficiently in advance of affected parts of the Work so as not to cause delay in the performance of the Work. Costs resulting from failure to do so will not be paid by the Owner.

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

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

1.4 Screening of RFI's

.1 Contractor shall satisfy itself that an RFI is warranted by undertaking a thorough review of the Contract Documents to determine that the claim, dispute, or other matters in question relating to the performance of the Work or the Interpretation of the Contract Documents cannot be resolved by direct reference to the Contract Documents.

Contractor shall describe in detail this review on the RFI form as part of the RFI submission. RFI submittals that lack such detailed review description, or where the detail provided is, in the opinion of the Consultant, insufficient, shall not be reviewed by the Consultant and shall be rejected.

1.5 Response to RFI's

.1 Consultant shall review RFI's from the Contractor submitted in accordance with this section with the following understandings:
  .1 Consultant's response shall not be considered as a Change Order or Change Directive, nor does it authorize changes in the Contract Price or Contract Time or changes in the Work.
  .2 Only the Consultant shall respond to RFI's. Responses to RFI's received from entities other than the Consultant shall not be considered.

1.6 Response Timing

.1 Allow 5 Working Days for review of each RFI by the Consultant.

.2 Consultant's review of RFI commences on date of receipt of RFI submission by the Consultant from Contractor and extends to date RFI returned by Consultant.

.3 When the RFI submission is received by Consultant before noon, review period commences that day. When RFI submittal is received by Consultant after noon, review period begins on the next Working Day.

.4 If, at any time, the Contractor submits a large enough number of RFI's or the Consultant considers the RFI to be of such complexity that the Consultant cannot process these RFI's within 5 Working Days, the Consultant will confer with the Contractor within 3 Working Days of receipt of such RFI's, and the Consultant and the Contractor will jointly prepare an estimate of the time necessary for processing same as well as an order of priority among the RFI's submitted. The Contractor shall accommodate such necessary time at no increase in the Contract Time and at no additional cost to the Owner.

PART 2 PRODUCTS

2.1 Not Used

.1 Not used

PART 3 EXECUTION

3.1 Not Used

.1 Not used

End of Section

PART 1 GENERAL

1.1 Section Includes

.1 Related Requirements
.2 Appointment and Payment
.3 Contractor's Responsibilities

1.2 Related Requirements

.1 Particular requirements for inspection and testing to be carried out by testing laboratory are specified under various sections.

1.3 Appointment and Payment

.1 The Owner will appoint an independent inspection and testing agency to provide Quality Assurance (QA) testing.

.2 Contractor will pay the independent inspection/testing agency from the Cash Allowance, including costs for equipment, facilities, and labour, except as follows:
.1 Inspection and testing required by laws, ordinances, rules, regulations or orders of public authorities.
.2 Testing, adjustment and balancing of conveying systems, mechanical and electrical equipment and systems.
.3 Mill tests and certificates of compliance.
.4 Tests specified to be carried out by Contractor under the supervision of Consultant.
.5 Additional tests specified in the following paragraph.

.3 Where tests or inspections by designated testing laboratory reveal Work not in accordance with contract requirements, pay costs for additional tests or inspections as required by Consultant or Owner to verify acceptability of corrected work.

1.4 Contractor's Responsibilities

.1 The Contractor shall be responsible for his own Quality Control and shall appoint and pay for independent inspection/testing agency, equipment, facilities, and labour to provide Quality Control (QC) testing where necessary to satisfy the Contractor's quality control plan. Such inspection and testing services will not be paid out of the Cash Allowance.

.2 Where independent inspection and testing has been appointed by the Consultant or Owner for Quality Assurance, the Contractor shall provide labour, equipment and facilities to assist in the independent inspection and testing agency and their representatives by:
.1 Providing access to Work to be inspected and tested.
.2 Facilitating inspections and tests.
.3 Making good Work disturbed by inspection and testing.

.3 Notify Owner and Consultant sufficiently in advance of testing & inspection operations (24hrs minimum).

.4 Where materials are specified to be tested, deliver representative samples in required quantity to testing laboratory.

.5 Pay costs for uncovering and making good Work that is covered before required inspection or testing is completed.

PART 2 PRODUCTS

2.1 Not Used

.1 Not used

PART 3 EXECUTION

3.1 Not Used

.1 Not used

End of Section

PART 1 GENERAL

1.1 Section Includes

.1 Preconstruction Conference
.2 Project Meetings
.3 On Site Documents
.4 Closeout Procedures
.5 Cost Breakdown

1.2 Preconstruction Conference

.1 The Consultant will call for and administer Preconstruction Conference at time and place to be announced.

.2 Contractor, all major Subcontractors, and major suppliers shall attend the Preconstruction Conference.

.3 Agenda will include, but not be limited to, the following items.
.1 Lines of communication and contact information
.2 Schedules
.3 Personnel and vehicle permit procedures
.4 Use of premises
.5 Location of any Contractor on-site facilities
.6 Security
.7 Housekeeping
.8 Submittal and RFI procedures
.9 Inspection and testing procedures, on-Site and off-Site
.10 Control and reference point survey procedures
.11 Health and Safety
.12 Contractor's Schedule of Values
.13 Contractor's Schedule of Submittals

.4 The Consultant will distribute copies of minutes to attendees. Attendees shall have seven (7) days to submit comments or additions to minutes. Minutes will constitute final documentation of results of Preconstruction Conference.

1.3 Project Meetings

.1 The Contractor will arrange project meetings and assume responsibility for setting times and recording and distributing minutes.

.2 Meetings will be held minimum bi-weekly.

1.4 On-Site Documents

.1 Maintain at job site, one copy each of the following:
.1 Contract drawings.
.2 Specifications.
.3 Addenda.
.4 Reviewed shop drawings.
.5 Requests for Information (RFI's)
.6 Change orders.
.7 Other modifications to Contract.

.8 Field test reports.
.9 Copy of approved Work schedule.
.10 Manufacturers' installation and application instructions.
.11 Health and Safety Plan and Other Safety Related Documents.
.12 Other documents as specified.

1.5 Cost Breakdown

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

PART 2 PRODUCTS

2.1 Not Used

.1 Not used

PART 3 EXECUTION

3.1 Not Used

.1 Not used

End of Section

PART 1 GENERAL

1.1 Section Includes

.1 Submittals
.2 Schedules
.3 Format
.4 Submission
.5 Critical Path Scheduling
.6 Submittals Schedule

1.2 Submittals

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

1.3 Schedules Required

.1 Submit schedules as follows:
  .1 Construction Progress Schedule.
  .2 Submittal Schedule for Shop Drawings and Product Data.
  .3 Submittal Schedule for Samples.
  .4 Product Delivery Schedule.
  .5 Cash Allowance Schedule for purchasing Products.
  .6 Shutdown or closure activity.

1.4 Format

.1 Prepare schedule in form of a horizontal bar chart using Microsoft Project 2016 or later.

.2 Provide a separate bar for each major item of work, trade or operation.

.3 Split horizontally for projected and actual performance.

.4 Provide horizontal time scale identifying first work day of each week.

.5 Format for listings: chronological order of start of each item of work.

.6 Identification of listings: By Systems description.

1.5 Submission

.1 Submit initial format of schedules within 10 working days after award of Contract.

.2 Submit schedules in electronic format, by email as PDF files.

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

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

.5 During progress of Work revise and resubmit schedule as directed by Consultant.

.6 Submit revised progress schedule with each application for payment.

.7 Distribute copies of revised schedule to:
- .1 Job site office.
- .2 Subcontractors.
- .3 Other concerned parties.
- .4 Instruct recipients to report to Contractor within 10 days, any problems anticipated by timetable shown in schedule.

.8 Table current and up to date schedule at each regular site meeting.

1.6 Critical Path Scheduling

.1 Include complete sequence of construction activities.

.2 Schedules shall represent a practical plan to complete the work within the Contract period, and shall convey the plan to execute the work. Schedules as developed shall show the sequence and interdependencies of activities required for complete performance of the work.

.3 The submittal of schedules shall be understood to be the Contractor's representation that the schedule meets the requirements of the Contract Documents and that the work will be executed in the sequence and duration indicated in the schedule.

.4 Failure to include any element of work required for performance of the Contract or failure to properly sequence the work shall not excuse the Contractor from completing all work within the Contract Time.

.5 All schedules shall be developed utilizing industry standard 'best practices' including, but not limited to:
- .1 No open-ended activities.
- .2 No use of constraints other than those defined in the Contract Documents without the prior approval of the Consultant.
- .3 No negative leads or lags.
- .4 No excessive leads or lags without prior justification and approval from the Consultant.
- .5 For individual schedule construction activities, do not exceed 14 days in duration without prior approval of the Consultant. Subdivide activities exceeding 14 days in duration to an appropriate level.
- .6 Sufficiently describe schedule activities to include what is to be accomplished in each work area. Express activity durations in whole days. Clearly define work that is to be performed by subcontract.
- .7 Create the schedule in conformance with the work-hours and constraints set forth in these Contract Documents.

.6 Include dates for commencement and completion of each major element of construction.

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

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

.9 Show changes occurring since previous submission of schedule:
- .1 Major changes in scope.
- .2 Activities modified since previous submission.
- .3 Revised projections of progress and completion.
- .4 Other identifiable changes.

.10 Provide a narrative report to define:
- .1 Problem areas, anticipated delays, and impact on schedule.
- .2 Corrective action recommended and its effect.
- .3 Effect of changes on schedules of other prime contractors.

1.7 Submittals Schedule

.1 Include schedule for submitting shop drawings, product data, and samples. Indicate manufacture and delivery lead times into the shop drawing submittal schedule.

.2 Indicate dates for submitting, review time, resubmission time, and last date for meeting fabrication schedule.

PART 2 PRODUCTS

2.1 Not Used

.1 Not used

PART 3 EXECUTION

3.1 Not Used

.1 Not used

End of Section

PART 1 GENERAL

1.1 Section Includes

.1 Administrative
.2 Requests for Information (RFI's)
.3 Shop Drawings and Product Data
.4 Interference Drawings
.5 Progress Photographs
.6 Samples
.7 Mock-Ups
.8 Certificates and Transcripts

1.2 Administrative

.1 Submit to Consultant submittals listed for review. Submit promptly and in orderly sequence to not cause delay in Work. Failure to submit in ample time is not considered sufficient reason for extension of Contract Time and no claim for extension by reason of such default will be allowed.

.2 Work affected by submittal shall not proceed until review is complete.

.3 Present shop drawings, product data, samples and mock-ups in metric units.

.4 Where items or information is not produced in metric units converted values are acceptable.

.5 Review submittals prior to submission to Consultant. This review represents that necessary requirements have been determined and verified, or will be, and that each submittal has been checked and coordinated with requirements of Work and Contract Documents. Submittals not stamped, signed, dated and identified as to specific project will be returned without being examined and considered rejected.

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

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

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

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

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

1.3 Requests for Information (RFI's)

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

1.4 Shop Drawings and Product Data

.1 The term "shop drawings" means drawings, diagrams, illustrations, schedules, performance charts, brochures, product data and other data which the Contractor provides to illustrate details of a portion of Work.

.2 Coordinate each submission with requirements of work and Contract Documents. Individual submissions will not be reviewed until all related information is available.

.3 Submit shop drawings bearing stamp and signature of qualified professional Engineer registered or licensed in the Province of Ontario where required by the individual specification sections. Each submittal and each resubmittal must bear the stamp of the Engineer

.4 Indicate materials, methods of construction and attachment or anchorage, erection diagrams, connections, explanatory notes and other information necessary for completion of Work. Where articles or equipment attach or connect to other articles or equipment, indicate that such items have been coordinated, regardless of Section under which adjacent items will be supplied and installed. Indicate cross references to design drawings and specifications.

.5 Prior to submission to Consultant, review all submitted drawings. By this review, Contractor represents to have determined and verified field measurements, site conditions, materials, catalogue number and similar data and to have checked and coordinated each drawing with the requirements of Work and of Contract Documents. Contractor's review of each drawing shall be indicated by stamp, date and signature of a responsible person.

.6 At time of submission, notify Consultant in writing of any deviations in drawings from the requirements of the Contract Documents.

.7 Allow ten (10) days for Consultant's review of each submission.

.8 Adjustments made on shop drawings by Consultant are not intended to change Contract Price. If adjustments affect value of Work, state such in writing to Consultant prior to proceeding with Work.

.9 Make any changes in submitted drawings which Consultant may require, consistent with Contract Documents and resubmit unless otherwise directed by Consultant. When resubmitting, notify Consultant in writing of any revisions other than those requested by Consultant.

.10 Accompany submissions with transmittal letter containing:
- .1 Date.
- .2 Project title and number.
- .3 Contractor's name and address.
- .4 Identification and quantity of each shop drawing, product data and sample.
- .5 Other pertinent data.

.11 Submissions shall include:
- .1 Date and revision dates.
- .2 Project title and number.
- .3 Name and address of:
  - .1 Subcontractor.
  - .2 Supplier.
  - .3 Manufacturer.
- .4 Contractor's stamp, signed by Contractor's authorized representative certifying approval of submissions, verification of field measurements and compliance with Contract Documents.
- .5 Details of appropriate portions of Work as applicable:
  - .1 Fabrication.
  - .2 Layout, showing dimensions, including identified field dimensions, and clearances.
  - .3 Setting or erection details.
  - .4 Capacities.
  - .5 Performance characteristics.

.6 Standards.
.7 Operating weight.
.8 Wiring diagrams.
.9 Single line and schematic diagrams.
.10 Relationship to adjacent work.

.12 After Consultant's review, distribute copies.

.13 Submit 3 prints plus one electronic copy in PDF format of shop drawings for each requirement requested in specification Sections and as Consultant may reasonably request.

.14 Submit electronic copy in PDF format of product data sheets or brochures for requirements requested in Specification Sections and as requested by Consultant where shop drawings will not be prepared due to standardized manufacture of product.

.15 Delete information not applicable to project.

.16 Supplement standard information to provide details applicable to project.

.17 If upon review by Consultant, no errors or omissions are discovered or if only minor corrections are made, copies will be returned, and fabrication and installation of Work may proceed. If shop drawings are rejected, noted copy will be returned and resubmission of corrected shop drawings, through same procedure indicated above, must be performed before fabrication and installation of Work may proceed.

.18 The review of shop drawings by the Consultant is for sole purpose of ascertaining conformance with general concept.
.1 This review shall not mean that the Consultant approves detail design inherent in shop drawings, responsibility for which shall remain with Contractor submitting same, and such review shall not relieve Contractor of responsibility for errors or omissions in shop drawings or of responsibility for meeting requirements of construction and Contract Documents.
.2 Without restricting generality of foregoing, Contractor is responsible for dimensions to be confirmed and correlated at job site, for information that pertains solely to fabrication processes or to techniques of construction and installation and for co-ordination of Work of sub-trades.

1.5 Interference Drawings

.1 Prepare interference drawings to coordinate the installation of the work of all sections, within available space. Conflicts between trades which could be determined beforehand, by the careful coordination and preparation of interference drawings, shall be corrected at no expense to the Owner.

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

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

1.6 Progress Photographs

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

1.7 Samples

.1 Submit for review samples as requested in respective specification Sections. Label samples with origin, manufacturer, product information, applicable specification section, and intended use.

.2 Notify Consultant in writing, at time of submission of deviations in samples from requirements of Contract Documents.

.3 Where colour, pattern or texture is criterion, submit full range of manufacturer's samples.

.4 Adjustments made on samples by Consultant are not intended to change Contract Price. If adjustments affect value of Work, state such in writing to Consultant prior to proceeding with Work.

.5 Make changes in samples which Consultant may require, consistent with Contract Documents.

.6 Reviewed and accepted samples will become standard of workmanship and material against which installed Work will be verified.

1.8 Mock-Ups

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

1.9 Certificates and Transcripts

.1 Immediately after award of Contract, Submit Workplace Safety and Insurance Board Experience Report.

PART 2 PRODUCTS

2.1 Not Used

.1 Not used

PART 3 EXECUTION

3.1 Not Used

.1 Not used

End of Section

PART 1 GENERAL

1.1 Section Includes

.1 Administrative
.2 Fires
.3 Disposal of Wastes
.4 Drainage
.5 Site Clearing and Plant Protection
.6 Pollution Control
.7 Unanticipated Soil Contamination

1.2 References

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

.2 OPSS 805 “Construction Specification for Temporary Erosion and Sediment Control Measures”.

1.3 Administrative

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

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

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

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

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

1.4 Fires

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

1.5 Disposal of Wastes

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

1.6 Drainage

.1 Provide temporary drainage and pumping as necessary to keep excavations and site free from water.

.2 Do not pump water containing deleterious substances into waterways, sewer or drainage systems.

.3 Protect storm drains against entry by sediment, debris, oil, or chemicals.

.4 Control disposal or runoff of water containing deleterious substances or other harmful substances in accordance with local authority requirements.

1.7 Site Clearing and Plant Protection

.1 Protect trees and plants on site and adjacent properties.

.2 Wrap in burlap, trees and shrubs adjacent to construction work, storage areas and trucking lanes, and encase with protective wood framework from grade level to height of 2 m.

.3 Protect roots of designated trees to dripline during excavation and site grading to prevent disturbance or damage.

.4 Restrict tree removal to areas indicated.

.5 Minimize stripping of topsoil and vegetation.

.6 Prevent unnecessary disturbance of top soil and underlying soil from vehicles and heavy equipment.

1.8 Pollution Control

.1 Maintain, inspect, and repair temporary erosion and pollution control features installed under this contract on a weekly basis. Submit inspection logs to the Owner when requested.

.2 Control emissions from equipment and plant to conform to federal, provincial, and municipal requirements.

.3 Cover or wet down dry materials and rubbish to prevent blowing dust and debris. Provide dust control for temporary roads.

.4 Take all measures necessary to prevent material and mud tracking on adjacent roads and streets.

.5 Use mechanical sweepers as often as necessary to keep adjacent roads and streets clean of material and mud that is deposited from this project.

.6 On site disposal or clean out of concrete trucks is not permitted. Any spillage of concrete onto asphalt or other surfaces must be cleaned up before spillage sets.

1.9 Unanticipated Soil Contamination

.1 Should unanticipated soil contamination be discovered:
  .1 Stop work and assess the situation for safety.
  .2 If situation does not appear to be safe, evacuate workers from area.
  .3 If safe to do so, take immediate steps to control any spread of contamination, in accordance with Contractor’s spill prevention and response plan.

  .4 Immediately contact the Consultant.

PART 2 PRODUCTS

2.1 Not Used

.1 Not used

PART 3 EXECUTION

3.1 Not Used

.1 Not used

End of Section

PART 1 GENERAL

1.1 Section Includes

.1 References.
.2 Owner's Regulations.
.3 Standards and Definitions.
.4 Designated Substances.
.5 Hazardous Materials.
.6 Spills Reporting.
.7 Protection of Water Quality.
.8 Potable Water Systems.
.9 Access for Inspection and Testing.
.10 Other Regulatory Requirements.

1.2 References

.1 Perform Work in accordance with Ontario Building Code (OBC), National Fire Code of Canada (NFC), the Canadian Electrical Code CSA C22.1-18, including all Supplements and other codes of provincial or local application provided that in case of conflict or discrepancy, more stringent requirements apply.

.2 Where a material is designated in the Contract Documents for a certain application, unless otherwise specified, that material shall conform to standards designated in the Code. Similarly, unless otherwise specified, installation methods and standards of workmanship shall also conform to standards invoked by the aforementioned Code.

.3 Meet or exceed requirements of:
.1 Contract documents.
.2 Specified standards, codes and referenced documents.
.3 Manufacturer's instructions.

.4 Where requirements of Contract Documents exceed Code requirements provide such additional requirements.

.5 Where the Building Code or the Contract Documents do not provide all information necessary for complete installation of an item, then the manufacturer's instructions for first quality workmanship shall be strictly complied with.

1.3 Owner's Regulations

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

1.4 Standards and Definitions

.1 Where a reference is made to specification standards produced by various organizations, conform to latest edition of standards, as amended and revised to date of Contract.

.2 Have a copy of each specified standard which relates to your work available on the site to be produced immediately on Consultant's request.

1.5 Designated Substances

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

.2 Stop work immediately when material resembling asbestos, mould or any other designated substance which is not identified in the Designated Substance Report is encountered during the course of the work. Notify Owner and Consultant immediately.

.3 The Owner will arrange for independent testing of suspected designated substances and removal of such substances encountered on the site during the course of the work which are not identified in the Designated Substance Report.

1.6 Hazardous Materials

.1 Definition: "Hazardous Material" is material, in any form, which by its nature, may be flammable, explosive, irritating, corrosive, poisonous, or may react violently with other materials, if used, handled or stored improperly. Included are substances prohibited, restricted, designated or otherwise controlled by law.

.2 Provide SDS for all materials brought to the Place of Work.

.3 Hazardous Materials will not be introduced for experimental or any other use prior to being evaluated for hazards.

.4 Make known to the Consultant those hazardous materials or designated substances intended to be used in the workplace and receive permission to use before introducing to the Owner’s property.

.5 Many common construction materials such as asbestos pipe and various insulations are designated substances and shall not be used under any circumstances. Such materials are banned from the Owner’s facilities.

1.7 Spills Reporting

.1 Spills or discharges of pollutants or contaminants under the control of the Contractor, and spills or discharges of pollutants or contaminants that are a result of the Contractor's operations that cause or are likely to cause adverse effects shall forthwith be reported to the Consultant. Such spills or discharges and their adverse effects shall be as defined in the Environmental Protection Act R.S.O. 1999.

.2 All spills or discharges of liquid, other than accumulated rain water, from luminaries, internally illuminated signs, lamps, and liquid type transformers under the control of the Contractor, and all spills or discharges from this equipment that are a result of the Contractor's operations shall, unless otherwise indicated in the Contract, be assumed to contain PCB's and shall forthwith be reported to the Consultant.

.3 This reporting will not relieve the Contractor of his legislated responsibilities regarding such spills or discharges.

1.8 Protection of Water Quality

.1 No waste or surplus organic material including topsoil is to be stored or disposed of within 30 metres of any watercourses. Run-off from excavation piles will not be permitted to drain directly into watercourses. Where this measure is not sufficient or feasible to control sediment entering the watercourses, sedimentation traps or geo-textile coverage will be required.

.2 If de-watering is required, the water shall be pumped into a sedimentation pond or diffused onto vegetated areas a minimum of 30 metres from any watercourses and not pumped directly into the watercourses.

.3 Provide all de-watering and sedimentation control required to properly complete the work of this contract.

.4 Supply, install and maintain silt/sediment control fencing along the edge of the site to intercept construction runoff silt, to the satisfaction of the Owner.

1.9 Potable Water Systems

.1 Potable water systems in completed buildings must meet criteria and guidelines established by Provincial and Municipal authorities, prior to occupancy by the Owner.

.2 Upon completion, submit testing certificates verifying water quality and water systems meets all applicable Provincial and Legislated Standards

1.10 Access for Inspection and Testing

.1 Cooperate fully with and provide assistance to, all outside authorities including Building Inspectors, utilities, testing agencies and consultants, with the inspection of the Work.

1.11 Other Regulatory Requirements

.1 Conform to the requirements of the Ontario Ministry of Transportation, Regional and Local authorities regarding transportation of materials.

.2 Obtain required road occupancy permits.

.3 Pay any required roadway damage deposits required by the local municipality.

.4 Conform to the requirements of the Ontario Ministry of the Environment.

.5 Conform to the requirements of the Ontario Ministry of Labour.

.6 Conform to the requirements of the local Conservation Authority.

.7 Conform to all applicable local by-laws, regulations and ordinances.

PART 2 PRODUCTS

2.1 Not Used

.1 Not used

PART 3 EXECUTION

3.1 Not Used

.1 Not used

End of Section

PART 1 GENERAL

1.1 Section Includes

.1 Inspection
.2 Independent Inspection Agencies.
.3 Access to Work
.4 Procedures
.5 Rejected Work
.6 Reports
.7 Contractors Responsibilities
.8 Tests and Mix Designs
.9 Mock-Ups
.10 Equipment and Systems.

1.2 Inspection

.1 Contractor is responsible for Quality Control (QC).

.2 Allow Owner and Consultant access to Work. If part of Work is in preparation at locations other than Place of Work, allow access to such Work whenever it is in progress.

.3 Give timely notice requesting inspection if Work is designated for special tests, inspections or approvals by Consultant instructions, or law of Place of Work.

.4 If Contractor covers or permits to be covered Work that has been designated for special tests, inspections or approvals before such is made, uncover such Work, have inspections or tests satisfactorily completed and make good such Work.

.5 Consultant will order part of Work to be examined if Work is suspected to be not in accordance with Contract Documents. If, upon examination such work is found not in accordance with Contract Documents, correct such Work and pay cost of examination and correction. If such Work is found in accordance with Contract Documents, Owner shall pay cost of examination and replacement.

1.3 Independent Inspection Agencies

.1 Independent Inspection/Testing Agencies will be engaged by Contractor for purpose of inspecting and/or testing portions of Work. Cost of such services will be borne by the Contractor and paid from the cash allowances specified in Section 01 21 13. Refer to Section 01 29 83.

.2 Provide equipment required for executing inspection and testing by appointed agencies.

.3 Employment of inspection/testing agencies does not relax responsibility to perform Work in accordance with Contract Documents.

.4 If defects are revealed during inspection and/or testing, appointed agency will request additional inspection and/or testing to ascertain full degree of defect. Correct defect and irregularities as advised by Consultant at no cost to Owner. Pay costs for retesting and re-inspection.

1.4 Access to Work

.1 Allow inspection/testing agencies access to Work, off site manufacturing and fabrication plants.

.2 Co-operate to provide reasonable facilities for such access.

1.5 Procedures

.1 Notify Owner and Consultant 48 hours in advance of requirement for tests, in order that attendance arrangements can be made.

.2 Submit samples and/or materials required for testing, as specifically requested in specifications. Submit with reasonable promptness and in orderly sequence to not cause delays in Work.

.3 Provide labour and facilities to obtain and handle samples and materials on site. Provide sufficient space to store and cure test samples

1.6 Rejected Work

.1 Remove defective Work, whether result of poor workmanship, use of defective products or damage and whether incorporated in Work or not, which has been rejected by Consultant as failing to conform to Contract Documents. Replace or re-execute in accordance with Contract Documents.

.2 Make good other work damaged by such removals or replacements promptly.

.3 If in opinion of Consultant it is not expedient to correct defective Work or Work not performed in accordance with Contract Documents, Consultant will deduct from Contract Price difference in value between Work performed and that called for by Contract Documents, amount of which will be determined by Consultant.

1.7 Reports

.1 Submit electronic pdf format inspection and test reports to Consultant.

.2 Provide copies to Subcontractor of work being inspected or tested or manufacturer or fabricator of material being inspected or tested.

1.8 Contractors Responsibilities

.1 Be responsible for the execution of the Construction Quality Plan and is to pay all costs for the execution of the Construction Quality Plan. Designate an experienced site representative for carrying out the Construction Quality Plan.

.2 Provide the Owner with a completed quality product for the Work. Contractor shall be responsible for any costs associated with re-testing and reperforming the Work as a result of the Contractor's poor performance or workmanship or other failure to comply with the Contract Documents.

.3 All Work shall be done by persons qualified in their respective trades, and the workmanship shall be first-class in every respect. Contractor is responsible for ensuring employees are appropriately trained. All materials and equipment furnished shall be the best of their respective kinds for the intended use and unless otherwise specified, same shall be new and of the latest design.

.4 The Consultant will have the authority to reject Work that does not conform to the Contract Documents or may require special inspection or testing, whether or not such Work is to be then fabricated, installed or completed.

.5 Failure by a Contractor to conduct its operations, means and methods and coordinate proper sequencing of the Work may cause the Owner to withhold payment or any other means deemed necessary to correct non-conforming Work.

.6 The Owner shall engage a testing firm to perform such engineering laboratory services and on-site inspection as deemed necessary by the Owner. The testing firm will determine compliance with the requirements of the Contract Documents. This Work will not be a service to the Contractors for the performing of tests and checking of materials required of the Contractors.

.7 Copies of test and inspection reports will be furnished to the Contractor. The laboratory and its representatives will be instructed to promptly call to the attention of the Contractor, any instance of non-compliance with the requirements of the Contract Documents. Failure to so notify the Contractor shall not relieve the Contractor of any of its responsibilities for compliance or making good workmanship or materials which are not in compliance with the requirements of the Contract Documents. The agency shall notify the Consultant and the Contractor promptly of irregularities or deficiencies observed in the Work during performance of its services

.8 Contractor's construction materials, procedures and work shall be subject to specified testing procedures and shall be in conformance with the Contract Documents as verified by Testing Agency.

.9 Cooperate with the testing firm and provide labor to assist with sample preparations where applicable.

.10 Except where specifically indicated to be provided by another entity as identified, inspections, tests, and similar quality control services including those specified to be performed by independent agency are the Contractor’s responsibility, and costs thereof are not to be included in contract sum.

.11 Cooperate with independent agencies performing required inspections, tests, and similar services. Provide auxiliary services as reasonably requested, including access to Work, the taking of samples or assistance with the taking of samples, delivery of samples to test laboratories, and security and protection for samples and test equipment at Project site.

.12 Coordination: Contractor and each engaged independent agency performing inspections, tests, and similar services for project are required to coordinate and sequence activities so as to accommodate required services with minimum delay of Work and without the need of removal/replacement of work to accommodate inspections and tests. Scheduling of times for inspections, tests, taking of samples, and similar activities is Contractor’s responsibility.

.13 Where sampling and testing is required for Sections of Work listed in the Contract Documents, the tests shall be performed by an independent testing lab and paid for by the Contractor.

.14 Test procedures to be used shall be submitted for approval of the Consultant where other than those specified are recommended by the testing agency.

.15 Testing Agency Duties: The independent Testing Agency engaged to perform inspections, sampling and testing of materials and construction specified in individual Specification Sections shall cooperate with the Owner, the Consultant and Contractors in performance of its duties, and shall provide qualified personnel to perform required inspections and tests.

.16 Contractor is responsible for scheduling times for inspections, tests, taking samples and similar activities.

1.9 Tests and Mix Designs

.1 Furnish test results and mix designs as requested.

1.10 Mock Ups

.1 Prepare mock-ups for Work specifically requested in specifications.

.2 Construct in locations acceptable to Consultant.

.3 Prepare mock-ups for Consultant's review with reasonable promptness and in orderly sequence, to not cause delays in Work.

.4 Failure to prepare mock-ups in ample time is not considered sufficient reason for extension of Contract Time and no claim for extension by reason of such default will be allowed.

.5 Mock-ups may remain as part of Work unless indicated otherwise.

1.11 Equipment and Systems

.1 Submit adjustment and balancing reports for mechanical, electrical and building equipment systems.

PART 2 PRODUCTS

2.1 Not Used

.1 Not used

PART 3 EXECUTION

3.1 Not Used

.1 Not used

End of Section

PART 1 GENERAL

1.1 General

.1 Scope and Purpose
- .1 This Section establishes the requirements for test specimens, apparatus, sampling, test procedures and test reports to be used in evaluating the performance of newly installed windows, storefronts, curtain walls and sloped glazing systems and their installation during construction; ("Test Area" hereafter referred to as "specimen").
- .2 The purpose of this specification is to provide a method which can be used to evaluate the installed performance of windows, storefronts, curtain walls and sloped glazing systems for air leakage and resistance to water penetration under controllable and reproducible test conditions intended to simulate wind driven rain events. Field air leakage testing is not recommended for a portion of continuous framing systems due to the complexity of compartmentalizing air chambers and cavities within these systems.

1.2 References

.1 ASTM International (ASTM)
- .1 ASTM E547-00(2016) Standard Test Method for Water Penetration of Exterior Windows, Skylights, Doors, and Curtain Walls by Cyclic Static Air Pressure Differential.
- .2 ASTM E783-02(2018) Standard Test Method for Field Measurement of Air Leakage Through Installed Exterior Windows and Doors
- .3 ASTM E1105-15 Standard Test Method for Field Determination of Water Penetration of Installed Exterior Windows, Skylights, Doors, and Curtain Walls, by Uniform or Cyclic Static Air Pressure Difference

.2 American Architectural Manufacturers Association (AAMA)
- .1 AAMA 501-15 Methods of Test for Exterior Walls
- .2 AAMA 502-12 Voluntary Specification for Field Testing of Newly Installed Fenestration Products
- .3 AAMA 503-14 Voluntary Specification for Field Testing of Newly Installed Storefronts, Curtain Walls, and Sloped Glazing Systems
- .4 AAMA 511-08 Voluntary Guideline for Forensic Water Penetration Testing of Fenestration Products

.3 CSA Group (CSA)
- .1 CSA A440-17 North American Fenestration Standard/Specification for Windows, Doors, and Skylights

1.3 Test Methods

.1 General
- .1 Field testing procedure and test apparatus shall meet the requirements of the following referenced ASTM test method. The most current revision of the ASTM method shall be identified in the specifications. If a revision number is not referenced, then the version current during the bidding stage of the project shall be used.
- .2 Resistance to air infiltration using static air pressure difference: ASTM E783.
- .3 Resistance to water penetration using static air pressure difference: ASTM E1105.

.2 Test Chamber Arrangement
- .1 Joints (transition seals) between the specimen and the adjacent wall, curb or roof shall be permitted to be included in the test specimen. The test chamber shall be applied to the interior or exterior of the wall, curb or roof construction in such a manner as to create a pressure differential across the specimen assembly, including perimeter frame intersections and perimeter seals, subframes, receptors and flashing.

.2 It is not practical to install a chamber on a segment of a continuous horizontal or vertical member; therefore air leakage testing of these systems is not recommended.
.3 Testing shall be performed immediately after the first units have been installed and regularly thereafter. All testing is to be performed prior to the installation of drywall or interior finish wall/roof materials if the transition seal from the glazing system to the adjacent wall system is to be tested. If interior finish wall/roof materials have been installed, they shall be removed at the test area to allow visual access to these areas to check for water penetration, or other means of visual access shall be provided. The test chamber shall be applied to the wall/roof system in such a manner as to apply a pressure differential to all joinery conditions and minimize extraneous air leakage.

1.4 Sampling

.1 As soon as practical after installation has begun, and after the test specimen has been completely installed, adjusted, cleaned and perimeter sealed (including adequate time for the sealant to cure), the specimen shall be tested for air leakage and water penetration resistance as specified in Article 1.5.
.1 All trades and contractors involved and responsible for the test specimen performance (i.e. manufacturer, erector, glazier, perimeter caulking contractor, etc.) shall be made aware of the test date and invited to witness the testing.

.2 If any of the specimen(s) do not conform to the prescribed air leakage and water penetration resistance requirements, the manufacturer and/or the installer shall be afforded the opportunity to perform a site inspection and determine the reason for non-compliance. Non-compliant specimen(s) shall be repaired as required and retested as soon as practical. The remedial work shall be recorded and approved by the specifying authority, Consultant and/or Owner. Upon satisfactorily passing a retest, the remedial work performed shall become punch list items to randomly check for similar conditions on the remainder of the project. If water leakage is observed and the source of the leakage cannot be determined, a forensic evaluation using the procedures outlined in AAMA 511 shall be performed while maintaining the test pressures defined in the field testing specifications and employing the test methods defined in AAMA 503.

.3 Testing shall be performed by a qualified independent testing agency.

.4 The following testing schedule shall be followed:
.1 Test #1: Mock-up Sample, which is considered to be the first assembly installed on the project; installation of the project glazing assemblies is not to progress until the mock-up assembly testing is deemed a pass by the Owner's representative or the Owner provides instruction to continue with the glazing assembly installation irrespective of the mock-up results.
.2 Test one glazing assembly of each window frame type randomly selected by the Owner's representative;
.3 For every failure other than the mock-up assembly, test an additional 1 assembly.

.5 The test area specimen(s) shall conform to the following:
.1 The test specimen's size and location shall be selected by the Owner's representative. If the specimen location has not been pre-determined, the location shall be selected by the Owner's representative unless delegated to the independent testing agency or building envelope consultant.
.2 If no specimen size and/or location is identified in the construction documents, select an appropriate size specimen that will provide representative performance data, usually a minimum of 9.3 m2. The specimen shall include, perimeter (transition) seals, typical splices, frame intersections, and, if applicable, at least two entire vision lites and two entire spandrel lites containing an intermediate vertical and an intermediate horizontal.

.3 The test specimen shall be representative of typical installations and construction for the project. The specimen(s) shall have no outstanding punch list items or visible damage or irregularities, nor be singled out because of obvious performance problems.
.4 After the specimen(s) locations have been selected, the Owner's representative shall direct the responsible contractor and/or manufacturer representative to remove interior finishes (if necessary), to clean the specimen(s) and remove adjoining sheetrock, trim, insulation or other materials, which could adversely affect the chamber attachment and visual inspection. Care shall be taken not to disturb the interior air seal, if present. Interior or exterior components that are required for product performance shall not be removed as some product installations require an interior air seal to perform as designed.

1.5 Test Procedures

.1 Air leakage resistance and water penetration resistance tests shall be performed at pressures specified in Paragraphs 1.5.2.1 and 1.5.2.2.
.1 Where both tests are to be conducted in sequence, the test for air leakage resistance shall be conducted before the test for water penetration resistance. If there is reason to believe that residual water from rain or other sources may be located in the specimen, a two-minute negative (outward) pressure test followed by a two-minute positive (inward) pressure test shall be conducted at the same pressure differential used for the performance test to purge the specimen of any residual water. The specimen gaskets or weatherstrips shall be examined and shall be dry before proceeding with the air leakage resistance test.

.2 All fenestration shall meet the following criteria and referred to the latest CSA A440 standard:
.1 Air leakage: A3 Fixed (maximum air leakage:0.55(m^3/h)m^(-1)).
.2 Water Penetration: B5

.3 Water penetration
.1 Attributable to the surrounding condition shall be defined as the presence of uncontrolled water which did not originate from the product specimen or the joint between the product specimen and the wall/roof.
.2 Water penetration attributable to the product specimen shall be defined as the penetration of water beyond the primary seal/plane of water resistance.
.3 Water penetration attributable to the perimeter joint shall be defined as uncontrolled water that indisputably originates at the joint.

1.6 Test Reports

.1 The report shall include enough information to reproduce the test. At a minimum, the following information shall be included:
.1 The testing agency, name of the individual(s) performing the tests, test witnesses, date and time of test, date of report, identification and location of the building shall be identified. The date of the last equipment calibration and the location of calibration records shall also be included in the report.
.2 Glazing Product Description
.1 The manufacturer, model, operation type (if applicable), dimensions, materials, etc.; identification and location of specimen(s) within the building; physical condition of specimen; description of any modifications made to the specimen; number of retests, etc. The test agency shall report the plumb, level and square condition of the tested specimen.
.3 Sampling Procedures
.1 If applicable, describe or list the procedures established from Article 1.4.

.4 Test Parameters
.1 List or describe the specified static pressure differential(s) used in the test, whether the chamber was affixed to the interior or exterior of the wall/roof and provide a detailed description (include sketches showing location, if appropriate) of the chamber attachment to the specimen. Provide a written description of any measures that were taken to control ambient conditions. Clearly identify any elements of the specimen that were not tested. Verify in a statement that the sample was inspected immediately prior to the test or installation of the chamber if it conceals portions of the specimen, that the original conditions were observed and documented, and that all surfaces were dry, such that water observed during or after testing was produced by the test itself and no other possible source.

.5 Test Results
.1 Record the following:
.1 Actual and allowable air leakage for the product specimen.
.2 Actual and allowable water penetration for the product specimen.
.3 Actual and allowable water penetration for the perimeter condition.
.4 Environmental conditions as measured at the time of the test: wind speed, wind direction, precipitation, barometric pressure and ambient temperature.

.6 Additional Observations
.1 If problems with a specimen installation are observed, they shall be brought to the responsible contractor's and/or manufacturer representative's attention.
.1 The observations to be recorded shall include but not be limited to the following:
.2 Deterioration of building elements due to water penetration
.3 Deviations of the installation from the drawings of record
.4 Staining or discolouration of building components
.5 Evidence of damage to either the installed product or the surrounding building elements
.6 Unusual or unexpected evidence of water penetration or air leakage which would require remediation
.7 Any observed performance or installation details which might be deemed of importance to a subsequent forensic investigation.

.7 Compliance Statement
.1 Make a statement that the tests were conducted in accordance with this specification or completely describe any deviation. Also, state whether or not the results indicate compliance with the field testing specification requirements.

1.7 Cost

.1 The cost of the testing company associated with the mock-up testing and specified initial quality assurance testing shall be paid for through the project inspection and testing allowance. The Contractor costs associated with executing the testing such as access, preparation, providing water, electricity, labour to support testing, etc. is not be paid from the project allowance and is to be included as part of the construction project bid price.

.2 The Contractor will be responsible for all costs associated with any retesting or additional testing that is the result of failures of mock-up and initial QA testing. These costs are to include all construction, testing agency, and Owner representative consulting fees associated with the retesting.

.3 Re-testing of same window on the same day, if requested due to failure to meet performance requirements, would be charged separately at an hourly rate of $150.

1.8 Contractor Responsibilities

.1 The following shall be provided by the Contractor:
- .1 All access (interior and exterior) required to perform the testing on the units selected;
- .2 Adequate water and power supply per the requirements of the testing agency; including hoses and power cords, and
- .3 One labourer to assist with the execution of the testing and clean-up following the testing.
- .4 Adequate water supply (standard garden-hose bib with minimum 1.5 m^3/h water flow at 310 kPa pressure) within 15 m of test area. A booster pump may be required if water flow and pressure cannot be maintained for the entire duration of test.
- .5 Contractor shall conduct a bucket-and-stopwatch check prior to test date to ensure adequate water supply.

Test Requirement	Maximum time allowed to fill a 22.7 gallon pail
2.4 x 2.4 m Spray Rack, A440 Water Test	50 Seconds
3.05 x 3.05 m Spray Rack, A440 Water Test	30 Seconds
AAMA 502 Field Check	40 Seconds

- .6 Electrical outlet, standard 115V, 15A within 15 m of test area.
- .7 Free and un-encumbered access to both the interior and exterior side of test area, such as removal of curtains and blinds, furniture, etc.
- .8 Free access to the wall cavity immediately beneath the window/door sill in order to inspect for any water penetration (as required by CSA A440). If such access was not provided, and if the window passes the water penetration test, the window would receive a "qualified Pass" with a note indicating that the area under the sill was not inspected.
- .9 Chamber installation requires installation of attachments and sealing to interior and exterior framing members and wall surfaces. This may result in unavoidable damage or staining of finished surfaces. Contractor shall allow for cleaning/repairing such damage or staining.
- .10 The onsite Contractor shall be responsible to ensure that all areas of the jobsite affected by window testing are protected from unsafe conditions.
- .11 If testing of installation joints/interfaces with surrounding wall construction is required, then the Onsite Contractor shall provide access to the interior air barrier and the primary installation seal so that the testing company may include such features in the test chamber.

PART 2 PRODUCTS

2.1 Not Used

.1 Not used

PART 3 EXECUTION

3.1 Not Used

.1 Not Used.

End of Section

PART 1 GENERAL

1.1 Section Includes

.1 Temporary utilities

1.2 Installation and Removal

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

.2 Remove from site all such work after use.

1.3 Dewatering

.1 Provide temporary drainage and pumping facilities to keep excavations and site free from standing water.

1.4 Water Supply

.1 Existing sources of water can be made available to the Contractor at no charge, subject to operational requirements. Arrange for connection and pay all costs for installation, maintenance and removal. Conversions or alterations to existing sources of water to meet construction requirements are the responsibility of the Contractor.

.2 The points of delivery and limits on amount available will be determined on site by the Owner whose written permission must be obtained before any connection is made.

1.5 Temporary Heating and Ventilation

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

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

.3 Provide temporary heat and ventilation in enclosed areas as required to:
- .1 Facilitate progress of Work.
- .2 Protect Work and products against dampness and cold.
- .3 Prevent moisture condensation on surfaces.
- .4 Provide ambient temperatures and humidity levels for storage, installation and curing of materials.
- .5 Provide adequate ventilation to meet health regulations for safe working environment.

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

.5 Ventilating:
- .1 Prevent accumulations of dust, fumes, mists, vapours or gases in areas occupied during construction.
- .2 Provide local exhaust ventilation to prevent harmful accumulation of hazardous substances into atmosphere of occupied areas.
- .3 Dispose of exhaust materials in manner that will not result in harmful exposure to persons.
- .4 Ventilate storage spaces containing hazardous or volatile materials.
- .5 Ventilate temporary sanitary facilities.

.6 Continue operation of ventilation and exhaust system for time after cessation of work process to assure removal of harmful contaminants.

.6 Permanent heating system of building may not be used when available, unless there are savings to the contract price and Consultant's written permission is obtained stating conditions of use, provisions relating to guarantees on equipment and operation and maintenance of system. Be responsible for damage to heating system if use is permitted.

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

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

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

.10 Maintain strict supervision of operation of temporary heating and ventilating equipment to:
.1 Conform to applicable codes and standards.
.2 Enforce safe practices.
.3 Prevent abuse of services.
.4 Prevent damage to finishes.
.5 Vent direct fired combustion units to outside.

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

1.6 Temporary Power and Light

.1 Existing sources of electric power can be made available to the Contractor. Conversions or alterations to existing sources of electric power to meet construction requirements are the responsibility of the Contractor.

.2 The points of delivery and limits on amount available will be determined on site by the Owner whose written permission must be obtained before any connection is made.

.3 Electrical power and lighting systems installed under this Contract may be used for construction requirements only with prior approval of Consultant provided that guarantees are not affected.

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

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

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

.7 All equipment used shall be CSA approved.

.8 Wiring and method of installation shall conform to local power requirements and shall be reviewed by a licensed inspector prior to use.

1.7 Temporary Communication Facilities

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

PART 2 PRODUCTS

2.1 Not Used

.1 Not used

PART 3 EXECUTION

3.1 Not Used

.1 Not used

End of Section

PART 1 GENERAL

1.1 Section Includes

.1 Construction aids.
.2 Site storage.
.3 Parking
.4 Offices
.5 Equipment and Material Storage.
.6 Sanitary facilities.
.7 Signage.
.8 Shoring

1.2 References

.1 CSA Group (CSA)
  .1 CAN/CSA Z321-96 (R2006) Signs and Symbols for the Workplace

1.3 Installation and Removal

.1 Provide construction facilities in order to execute work expeditiously.

.2 Remove from site all such work after use.

1.4 Scaffolding

.1 Provide and maintain scaffolding, ramps, ladders, swing staging, platforms and temporary stairs.

1.5 Hoisting

.1 Provide, operate and maintain hoists and cranes required for moving of workers, materials and equipment.

.2 Hoists and cranes shall be operated by qualified operator.

1.6 Site Storage/Loading

.1 Do not unreasonably encumber premises with products.

.2 Do not load or permit to load any part of Work with a weight or force that will endanger the Work.

1.7 Construction Parking

.1 Parking will be permitted on site at areas designated by the Owner provided it does not disrupt performance of Work or ongoing Owners operations.

.2 Provide and maintain adequate access to project site.

.3 If authorized to use existing roads for access to project site, maintain such roads for duration of Contract and make good damage resulting from Contractors' use of roads.

1.8 Offices

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

1.9 Equipment, Tool and Material Storage

.1 Provide and maintain, in a clean and orderly condition, lockable weatherproof sheds for storage of tools, equipment and materials.

.2 Locate materials not required to be stored in weatherproof sheds on site in a manner to cause least interference with work activities.

1.10 Sanitary Facilities

.1 Provide sanitary facilities for work force in accordance with governing regulations and ordinances.

.2 Post notices and take such precautions as required by local health authorities. Keep area and premises in sanitary condition.

1.11 Construction Signage

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

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

.3 Post "Construction Zone" signage outside barrier and entrance to all work areas.

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

.5 Install signage to direct site traffic and deliveries to the Construction work areas.

1.12 Shoring

.1 Examine the site to determine the conditions under which work will be performed.

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

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

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

.5 All shoring and frame braces must be supplied with a safe load rating which must not be exceeded. Install in accordance with manufacturer's recommended procedures and safety guidelines. Ensure that the safe load conditions of the shoring are not exceeded by dead, live or construction loads.

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

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

.8 Submit shoring drawings and a proposed installation procedure stamped by a professional engineer registered in the Province of Ontario. Procedures shall follow the information provided on these drawings. The shoring design engineer shall be retained and paid for by the Contractor. The shoring engineer shall review all existing conditions on site prior to completing shoring design.

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

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

.11 The failure or refusal of the Consultant to suggest the use of shoring, shall not in any way or to any extent relieve the Contractor of any responsibility concerning the condition of the work or of any of their obligations under the Contract, nor impose any liability on the Owner or their agents; nor shall any delay, whether caused by any action or want of action on the part of the Contractor, or by any act of the Owner, or their agents, or employees, relieve the Contractor from necessity of properly and adequately protecting the existing structure from collapse or damage, nor from and of his obligations under the Contract relating to injury to persons or property, nor entitle him to any claims for extra compensation or an extension in schedule.

PART 2 PRODUCTS

2.1 Not Used

.1 Not used

PART 3 EXECUTION

3.1 Not Used

.1 Not used

End of Section

PART 1 GENERAL

1.1 Section Includes

.1 Barriers.
.2 Environmental Controls.
.3 Traffic Controls.
.4 Fire Routes.
.5 Relics and Antiquities

1.2 Installation and Removal

.1 Provide temporary controls in order to execute Work expeditiously.

.2 Remove from site all such work after use.

1.3 Site Fencing

.1 Contractor's lay-down area indicated on the drawings must be secure and there must be no access by unauthorized persons. Provide temporary fencing around whole work site. Use modular free-standing fencing: galvanized, minimum 1.8m high, chain link or welded steel mesh, pipe rail. Provide one lockable truck entrance gate and at least one pedestrian door as directed. Equip all gates with locks and keys. Maintain fence in good repair.

1.4 Hoarding

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

1.5 Guard Rails and Barricades

.1 Provide secure, rigid guard rails and barricades around deep excavations, open shafts, open stair wells, open edges of floors and roofs.

.2 Provide as required by governing authorities.

1.6 Traffic Barriers

.1 Where indicated, provide precast concrete barriers conforming to ASTM C825 - 06(2011) Standard Specification for Precast Concrete Barriers.

.2 Provide sufficient barriers as necessary to protect the public and Owner from construction traffic.

.3 Remove barriers on completion.

1.7 Weather Enclosures

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

.2 Close off floor areas where walls are not finished; seal off other openings; enclose building interior work for temporary heat.

.3 Design enclosures to withstand wind pressure and snow loading.

1.8 Dust Tight Screens

.1 Provide dust tight screens or partitions to localize dust generating activities, and for protection of workers, finished areas of Work and public.

.2 Maintain and relocate protection until such work is complete.

1.9 Protection for Off Site and Public Property

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

.2 Be responsible for damage incurred.

1.10 Protection of Building Finishes

.1 Provide protection for finished and partially finished building finishes and equipment during performance of Work.

.2 Provide necessary screens, covers, and hoardings.

.3 Confirm with Consultant locations and installation schedule 3 days prior to installation.

.4 Be responsible for damage incurred due to lack of or improper protection.

1.11 Protection of Surrounding Work

.1 Provide protection for finished and partially finished Work from damage.

.2 Provide necessary cover and protection.

.3 Be responsible for damage incurred due to lack of or improper or inappropriate protection.

1.12 Public Traffic Flow

.1 Provide and maintain competent signal flag operators, traffic signals, barricades and flares, lights, or lanterns as required to perform Work and protect the public.

1.13 Fire Routes

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

1.14 Relics and Antiquities

.1 Protect relics, antiquities, items of historical or scientific interest such as cornerstones and contents, commemorative plaques, inscribed tablets, and similar objects found during course of Work.

.2 Give immediate notice to Owner and await Owner’s written instructions before proceeding with Work in this area.

.3 Relics, antiquities, and items of historical or scientific interest remain the Owner’s property.

PART 2 PRODUCTS

2.1 Not Used

.1 Not used

PART 3 EXECUTION

3.1 Not Used

.1 Not used

End of Section

PART 1 GENERAL

1.1 Section Includes

.1 Product quality, availability, storage, handling, protection, and transportation.
.2 Manufacturer's instructions.
.3 Quality of Work, coordination and fastenings.
.4 Existing Utilities

1.2 Quality

.1 Products, materials, equipment and articles incorporated in Work shall be new, not damaged or defective, and of best quality (compatible with specifications) for purpose intended. If requested, furnish evidence as to type, source and quality of products provided.

.2 Defective products, whenever identified prior to completion of Work, will be rejected, regardless of previous inspections. Inspection does not relieve responsibility but is precaution against oversight or error. Remove and replace defective products at own expense and be responsible for delays and expenses caused by rejection.

.3 Should any dispute arise as to quality or fitness of products, decision rests strictly with Consultant based upon requirements of Contract Documents.

.4 Unless otherwise indicated in specifications, maintain uniformity of manufacture for any particular or like item throughout building.

.5 Permanent labels, trademarks and nameplates on products are not acceptable in prominent locations, except where required for operating instructions, or when located in mechanical or electrical rooms.

1.3 Availability

.1 Review product delivery requirements and anticipate foreseeable supply delays for any items. If delays in supply of products are foreseeable, notify Consultant of such, in order that substitutions or other remedial action may be authorized in ample time to prevent delay in performance of Work.

.2 In event of failure to notify Consultant at commencement of Work and should it subsequently appear that Work may be delayed for such reason, Consultant reserves right to substitute more readily available products of similar character, at no increase in Contract Price or Contract Time.

1.4 Storage, Handling and Protection

.1 Handle and store products in manner to prevent damage, adulteration, deterioration and soiling and in accordance with manufacturer's instructions when applicable.

.2 Store packaged or bundled products in original and undamaged condition with manufacturer's seal and labels intact. Do not remove from packaging or bundling until required in Work.

.3 Store products subject to damage from weather in weatherproof enclosures.

.4 Store cementitious products clear of earth or concrete floors, and away from walls.

.5 Keep sand, when used for grout or mortar materials, clean and dry. Store sand on wooden platforms and cover with waterproof tarpaulins during inclement weather.

.6 Store sheet materials and lumber on flat, solid supports and keep clear of ground. Slope to shed moisture.

.7 Store and mix paints in heated and ventilated room. Remove oily rags and other combustible debris from site daily. Take every precaution necessary to prevent spontaneous combustion.

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

.9 Touch up damaged factory finished surfaces to Consultant's satisfaction. Use touch up materials to match original. Do not paint over name plates.

1.5 Transportation

.1 Pay costs of transportation of products required in performance of Work.

.2 Transportation cost of products supplied by Owner will be paid for by Owner. Contractor shall be responsible for the unloading, handling and storage of such products.

1.6 Manufacturer’s Instructions

.1 Unless otherwise indicated in specifications, install or erect products in accordance with manufacturer's instructions. Do not rely on labels or enclosures provided with products. Obtain written instructions directly from manufacturers.

.2 Notify Consultant in writing, of conflicts between specifications and manufacturer's instructions, so that Consultant may establish course of action.

.3 Improper installation or erection of products, due to failure in complying with these requirements, authorizes Consultant to require removal and re installation at no increase in Contract Price or Contract Time.

1.7 Quality of Work

.1 Ensure Quality of Work is of highest standard, executed by workers experienced and skilled in respective duties for which they are employed.

.2 Immediately notify Consultant if required Work is such as to make it impractical to produce required results.

.3 Do not employ anyone unskilled in their required duties. Consultant reserves right to require dismissal from site, workers deemed incompetent or careless.

.4 Decisions as to standard or fitness of Quality of Work in cases of dispute rest solely with Consultant, whose decision is final.

1.8 Coordination

.1 Ensure cooperation of workers in laying out Work. Maintain efficient and continuous supervision.

.2 Be responsible for coordination and placement of openings, sleeves and accessories.

1.9 Concealment

.1 In finished areas, conceal pipes, ducts and wiring in floors, walls and ceilings, except where indicated otherwise.

.2 Before installation, inform Consultant if there is interference. Install as directed by Consultant.

1.10 Remedial Work

.1 Perform remedial work required to repair or replace parts or portions of Work identified as defective or unacceptable. Coordinate adjacent affected Work as required.

.2 Perform remedial work by specialists familiar with materials affected. Perform in a manner to neither damage nor put at risk any portion of Work.

1.11 Location of Fixtures

.1 Consider location of fixtures, outlets, and mechanical and electrical items indicated as approximate.

.2 Inform Consultant of conflicting installation. Install as directed.

1.12 Fastenings

.1 Provide metal fastenings and accessories in same texture, colour and finish as adjacent materials, unless indicated otherwise.

.2 Prevent electrolytic action between dissimilar metals and materials.

.3 Use non corrosive hot dip galvanized steel fasteners and anchors for securing exterior work, unless stainless steel or other material is specifically requested in affected specification Section.

.4 Space anchors within individual load limit or shear capacity and ensure they provide positive permanent anchorage. Wood, or any other organic material plugs are not acceptable.

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

.6 Fastenings which cause spalling or cracking of material to which anchorage is made are not acceptable.

1.13 Fastenings – Equipment

.1 Use fastenings of standard commercial sizes and patterns with material and finish suitable for service.

.2 Use heavy hexagon heads, semi-finished unless otherwise specified. Use No. 304 stainless steel for exterior areas.

.3 Bolts may not project more than one diameter beyond nuts.

.4 Use plain type washers on equipment, sheet metal and soft gasket lock type washers where vibrations occur. Use resilient washers with stainless steel.

1.14 Protection of Work in Progress

.1 Adequately protect Work completed or in progress. Work damaged or defaced due to failure in providing such protection is to be removed and replaced, or repaired, as directed by Consultant, at no increase in Contract Price or Contract Time.

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

1.15 Existing Utilities

.1 When breaking into or connecting to existing services or utilities, execute Work at times directed by local governing authorities, with minimum of disturbance to Work, and/or building occupants and pedestrian and vehicular traffic.

.2 Protect, relocate or maintain existing active services. When services are encountered, cap off in manner approved by authority having jurisdiction. Stake and record location of capped service.

1.16 Hazardous Materials

.1 Report any found or suspected hazardous materials to the Owner.

PART 2 PRODUCTS

2.1 Not Used

.1 Not used

PART 3 EXECUTION

3.1 Not Used

.1 Not used

End of Section

PART 1 GENERAL

1.1 Section Includes

.1 Safety Requirements
.2 Fire Protection
.3 Accident Reporting
.4 Records on Site

1.2 References

.1 Fire Commissioners of Canada, FC 301, Standard for Construction Operations.
.2 Canada Labour Code, Part 2, Canada Occupational Safety and Health Regulations.
.3 Ontario Building Code.
.4 Occupational Health and Safety Act.
.5 R.R.O. 1990, Reg. 860: Workplace Hazardous Materials Information System (WHMIS)
.6 National Fire Protection Agency (NFPA)
  .1 NFPA 241 Standard for Safeguarding Construction, Alteration, and Demolition Operations

1.3 Submittals

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

.2 Submit to Owner and Consultant copies of the following documents, including updates issued:
  .1 Notice of Project filed with Provincial Ministry of Labour or equivalent for Place of Work
  .2 Site-specific Health and Safety Plan prior to commencement of work on the work site. Plan shall include but not be limited to the following:
    .1 Name and contact info of Contractor's Health and Safety Representative for Work Site; including twenty-four (24) hour emergency contact phone numbers.
    .2 Phone numbers of local fire, police, and ambulance outside of 911 services.
    .3 Location of nearest medical facility and level of injury that each can service.
  .3 Submit to the Owner, Consultant and Municipal Fire Department, for review, a “Fire Safety Plan” conforming to Section 2.14 of the National Fire Code of Canada. Maintain a copy of the “Fire Safety Plan” on site.
  .4 Copies of certification for all employees on site of applicable safety training including, but not limited to:
    .1 WHIMIS.
    .2 Fall arrest and protection.
    .3 Suspended Access Equipment.
    .4 Erection of Scaffolding.
    .5 License for powder actuated devices.
  .5 On-site Contingency and Emergency Response Plan addressing:
    .1 Standard procedures to be implemented during emergency situations.
    .2 Preventative planning and protocols to address possible emergency situations.

.3 Guidelines for handling, storing, and disposing of hazardous materials that maybe encountered on site, including measures to prevent damage or injury in case of an accidental spill.

.4 Incident and accident reports, promptly if and upon occurrence
  .1 Reports or directions issued by authorities having jurisdiction, immediately upon issuance from that authority.
  .2 Accident or Incident Reports, within 24 hours of occurrence.

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

1.4 Compliance Requirements

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

1.5 Constructor

.1 Notify all regulatory bodies required for construction activities, (i.e., Notice of Project, employer notification, etc.). Notifications shall include, but not be limited to, the notification requirements laid out in OHSA Sec 51-53 and the requirements of Ontario Regulation 213/91 for Construction Projects, Sections 5, 6 and 7. For the purpose of this contract the Contractor shall be the "Constructor".

.2 The “Constructor” will be solely responsible for the safety of all persons on the Site.

1.6 Safety Requirements

.1 Observe and enforce all construction safety measures and comply with the latest edition and amending regulations of the following documents and in the event of any differences among those provisions, the most stringent shall apply:
.1 Occupational Health and Safety Act and Regulations for Construction Projects, August 1997, Ontario Regulation 213/91 including amendments.
.2 Hazardous Products Act and Canada Labour Code.
.3 The Workplace Safety and Insurance Board, O-Reg 454.
.4 Ontario Building Code Act, Ontario Regulation 332/12 including amendments.
.5 National Building Code of Canada, Part 8: Safety Measures on Construction and Demolition Sites.
.6 National Fire Code of Canada.
.7 NFPA 241 Standard for Safeguarding Construction, Alteration, and Demolition Operations, 2013 Edition
.8 Environmental Protection Act.
.9 The Power Commission Act.
.10 The Boiler and Pressure Vessels Act.
.11 The Elevators and Lifts Act.
.12 The Operating Engineer's Act.
.13 Municipal statutes.

.2 Obey all Federal, Provincial and Municipal Laws, Acts, Statutes, Regulations, Ordinances and By-laws which could in any way, pertain to the work outlined in the Contract, or to any employees of the Contractor. Satisfy all statutory requirements imposed by the Occupational Health and Safety Act and Regulations made thereunder, on a Contractor, and Constructor and/or Employer with respect to or arising out of the performance of the Contractors obligations under this Contract.

.3 Working at Heights: The supervisor of the project, will be responsible to ensure that his employees and subcontractors/suppliers have current Working at Heights and Fall Protection certification.

.4 The supervisor of the project will be responsible for his employees and subcontractors/suppliers maintaining standard safety practices, as well as the specific safety rules listed below, while working on the Owner’s property.

.5 The Owner reserves the right to order individuals to leave the site if the individual is in violation of any safety requirement or any Act. Any expense incurred will be the responsibility of the Contractor.

.6 Notify the Owner should any hazardous condition become apparent.

.7 Enforce the use of CSA approved hard hats, reflective vests and safety boots for all persons entering or working at the construction site. Refuse admission to those refusing to conform to this requirement.

.8 Provide safeguard and protection against accident, injury or damage to any person on the site, adjacent work areas and adjacent property.

1.7 Confined Space

.1 Confined Space: Where applicable, provide the Consultant and all Regulatory Authorities with a copy of the Contractors' Confined Space Entry Procedure. In the event that defined procedures are not available, abide by the applicable requirements of the Occupational Health and Safety Act and all regulations made thereunder.

.2 Persons intended to work in confined spaces, as defined by the Owner, must have formal training in performing work in confined spaces.

.3 Provide proof of valid certificates of such training for all workers prior to entry of such workers into confined spaces.

.4 Provide all necessary safety equipment for entry into confined spaces.

.5 Where workers are required to enter a confined space, as defined by the OHSA, O. Reg. 632/05 Section 221.2, ensure that workers of the Contractor and all Subcontractors follow the requirements of the above legislation, including but not limited to:
.1 Having a method for recognizing each confined space to which the program applies
.2 Having a method for assessing the hazards to which workers may be exposed
.3 Having a method for the development of confined space entry plans (which include on-site rescue procedures)
.4 Having a method for training workers
.5 Having an entry-permit system.
.6 Supply the necessary tools and equipment to perform the confined space entry. These items include, but are not limited to, required documentation, gas detectors, breathing equipment, fall protection and rescue equipment.

1.8 Safety Meetings

.1 Site toolbox safety meetings will be held weekly for all Contractor employees and all sub trade contractors.

.2 Where a Joint Health and Safety Committee is required on a project, workers and supervisors, selected, as members of the committee must attend.

1.9 Workplace Hazardous Materials Information System (WHMIS)

.1 Be familiar with WHIMIS regulations and be responsible for compliance.

.2 Provide to the Consultant a list of Designated Substances that will be brought to the site prior to commencing work. Safety Data Sheets (SDS) and the hazardous material inventory for each substance listed must be kept on the Project.

.3 Be responsible for all other requirements of regulations as applicable to Employers.

.4 All controlled products to be properly labelled and stored.

.5 Immediately inform Owner and Consultant if any unforeseen or peculiar safety-related factor, hazard, or condition becomes evident during performance of Work.

1.10 Fire Protection

.1 Provide and maintain safeguard and protection against fire in accordance with current fire codes and regulations.

.2 Provide temporary fire protection throughout the course of construction. Particular attention shall be paid to the elimination of fire hazards.

.3 Comply with the requirements of FCC No. 301 Standards for Construction Operations issued by the Fire Commissioner of Canada and the National Building Code.

.4 Provide and maintain portable fire extinguishers during construction, in accordance with Part 6 of the National Fire Code of Canada 2015 and NFPA 241.

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

1.11 Accident Reporting

.1 Investigate and report incidents and accidents as required by Occupational Safety and Health Act, and the Regulations made pursuant to the Act.

1.12 Records on Site

.1 Maintain on site a copy of the safety documentation as specified in this section and any other safety related reports and documents issued to or received from the authorities having jurisdiction.

.2 Upon request, make copies available to the Consultant.

PART 2 PRODUCTS

2.1 Not Used

.1 Not used

PART 3 EXECUTION

3.1 Not Used

.1 Not used

End of Section

PART 1 GENERAL

1.1 Section Includes

.1 Field Engineering survey services to measure and stake site.
.2 Survey services to establish and confirm inverts for Work.
.3 Recording of subsurface conditions found.

1.2 Submittals

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

.2 Submit name and address of Surveyor to Consultant.

.3 On request of Consultant, submit documentation to verify accuracy of field engineering work.

.4 Submit certificate signed by surveyor certifying and noting those elevations and locations of completed Work that conform and do not conform to Contract Documents.

1.3 Examination of Work and Site

.1 Examine the site and existing building to be fully informed of their particulars as related to the Work.

.2 Verify dimensions of completed Work in place before fabrication of Work to be incorporated with it. Ensure that all necessary job dimensions are taken for the proper execution of the work. Assume complete responsibility for the accuracy and completeness of such dimensions.

.3 No claims for extra payment will be paid for extra work made necessary or for difficulties encountered due to conditions of the site which were visible or reasonably inferable from an examination of the site at the time prior to tender closing date and furthermore, failure of the Contractor to visit and examine the site shall be deemed a waiver of all claims for extra payment due to any condition of the site existing prior to tender closing date.

.4 As-found damage: Record by photography and submit evidence to Owner's representative before commencing work, any found damaged surfaces or materials adjacent to new work, and not included under scope of this new work. Remedial work to any damage, not so recorded, shall be the responsibility of the Contractor.

1.4 Qualifications of Surveyor

.1 Qualified registered land surveyor, licensed to practice in Place of Work, acceptable to Consultant.

1.5 Survey Reference Points

.1 Existing control points are designated on drawings.

.2 Locate, confirm and protect control points prior to starting site work. Preserve permanent reference points during construction.

.3 Make no changes or relocations without prior written notice to Consultant.

.4 Report to Consultant when reference point is lost or destroyed or requires relocation because of necessary changes in grades or locations.

.5 Require surveyor to replace control points in accordance with original survey control.

1.6 Survey Requirements

.1 Establish two permanent bench marks on site, referenced to established bench marks by survey control points. Record locations, with horizontal and vertical data in Project Record Documents.

.2 Establish lines and levels, locate and lay out, by instrumentation.

.3 Stake for grading, fill and topsoil placement and landscaping features.

.4 Stake slopes and berms.

.5 Establish pipe invert elevations.

.6 Stake batter boards for foundations.

.7 Establish foundation and floor elevations.

.8 Establish lines and levels for mechanical and electrical work.

1.7 Existing Services

.1 Before commencing work, establish location and extent of service lines in area of Work and notify Consultant of findings. The Contractor is responsible for coordination of all utility locates.

.2 Remove abandoned service lines within 2 m of structures. Cap or otherwise seal lines at cut off points as directed by Consultant.

.3 Where Work involves breaking into or connecting to existing services, carry out work at times directed by authorities having jurisdiction, with minimum of disturbance to building occupants, pedestrian and vehicular traffic.

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

.5 Install temporary drain plugs to prevent construction debris from blocking pipes downstream of the work.

.6 All existing concrete floor slabs shall be scanned prior to any cutting or breaking of concrete. Employ a qualified concrete scanning company or inspection and testing agency to scan and map floor slabs for reinforcing, plastic and metal conduit, piping, grounding cables, embedments and the like. Map all slabs and provide copies to the Owner and Consultant.

1.8 Location of Services, Equipment and Fixtures

.1 Location of services, equipment, fixtures and outlets indicated on drawings or specified are to be considered as approximate.

.2 Locate equipment, fixtures and distribution systems to provide minimum interference and maximum usable space and in accordance with manufacturer's recommendations for safety, access and maintenance. Include existing equipment which affects or will be affected by the work.

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

.4 Location of site services where required, is approximate and is based on information provided by the Owner. Undertake all locates to determine exact locations of existing services and lay out new services to avoid any conflicts with new building elements, including site improvements, building foundations and other new or existing services.

.5 Submit field drawings and interference drawings to indicate relative position of various services and equipment. Refer to requirements for interference drawings specified elsewhere.

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

.7 Prepare drawings to indicate coordination and methods of installation of a system with other systems where their relationship is critical. Ensure that all details of equipment apparatus and connections are coordinated.

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

.9 Submit interference drawings to Owner and Consultant in accordance with Section 01 33 00.

1.9 Records

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

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

1.10 Subsurface Conditions

.1 Promptly notify Consultant in writing if subsurface conditions at Place of Work differ materially from those indicated in Contract Documents, or a reasonable assumption of probable conditions based thereon.

.2 After prompt investigation, should Consultant determine that conditions do differ materially, instructions will be issued for changes in Work.

PART 2 PRODUCTS

2.1 Not Used

.1 Not used

PART 3 EXECUTION

3.1 Not Used

.1 Not used

End of Section

PART 1 GENERAL

1.1 Section Includes

.1 Requirements and limitations for cutting and patching the Work.

1.2 Submittals

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

.2 Submit written request and obtain Consultant's approval in advance of cutting or alteration which affects:
.1 Structural integrity of any element of Project.
.2 Integrity of weather exposed or moisture resistant elements.
.3 Efficiency, maintenance, or safety of any operational element.
.4 Visual qualities of sight exposed elements

1.3 Materials

.1 As specified and required for original installation.

.2 Change in Materials: Submit request for substitution in accordance with Section 01 25 00 - Substitution Procedures.

.3 Requests for change in materials shall include documentation indicating conformance to project requirements and intent.

1.4 Definitions

.1 Cutting: Removal of in-place construction necessary to permit installation or performance of other work.

.2 Patching: Fitting and repair work required to restore construction to original conditions after installation of other work.

PART 2 PRODUCTS

2.1 Materials

.1 General: Comply with requirements specified in other Sections.

.2 In-Place Materials: Use materials for patching identical to in-place materials. For exposed surfaces, use materials that visually match in-place adjacent surfaces to the fullest extent possible.

.3 If identical materials are unavailable or cannot be used, use materials that, when installed, will provide a match acceptable to Consultant for the visual and functional performance of in-place materials.

PART 3 EXECUTION

3.1 Preparation

.1 Inspect existing conditions, including elements subject to damage or movement during cutting and patching.

.2 After uncovering, inspect conditions affecting performance of Work.

.3 Beginning of cutting or patching means acceptance of existing conditions.

.4 Provide supports to assure structural integrity of surroundings; provide devices and methods to protect other portions of project from damage.

.5 Provide protection from elements for areas which may be exposed by uncovering work; maintain excavations free of water.

3.2 General

.1 Carry out all cutting and patching required for the work of the Contract.

.2 Repair all wall and floor surfaces where items have been removed.

.3 Make good all finishes as required.

.4 Repaint damaged wall surfaces.

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

.6 Uncover Work to install ill-timed Work.

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

.8 Provide cutting and patching of all openings in non-structural elements of Work as necessary to complete installation of mechanical and electrical Work. Include complete removal and replacement of such elements as necessary to provide construction access.

.9 Execute Work by methods to avoid damage to other Work, and which will provide proper surfaces to receive patching and finishing.

.10 Employ original installer to perform cutting and patching for weather-exposed and moisture-resistant elements, and sight-exposed surfaces.

.11 Cut rigid materials using masonry saw or core drill. Pneumatic or impact tools are not allowed on masonry work without prior approval.

.12 Restore work with new products in accordance with requirements of Contract Documents.

.13 Fit work airtight to pipes, sleeves, ducts, conduit, and other penetrations through surfaces.

.14 At penetration of fire rated wall, ceiling, or floor construction, completely seal voids with “ULC approved firestopping material, full thickness of the construction element. Include any openings in existing building elements created by removal of existing services or equipment.

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

3.3 Cutting and Patching

.1 General: Employ skilled workers to perform cutting and patching. Proceed with cutting and patching at the earliest feasible time, and complete without delay.

.2 Cut in-place construction to provide for installation of other components or performance of other construction, and subsequently patch as required to restore surfaces to their original condition.

.3 Existing Warranties: Remove, replace, patch, and repair materials and surfaces cut or damaged during installation or cutting and patching operations, by methods and with materials so as not to void existing warranties.

.4 Temporary Support: Provide temporary support of work to be cut.

.5 Protection: Protect in-place construction during cutting and patching to prevent damage. Provide protection from adverse weather conditions for portions of Project that might be exposed during cutting and patching operations.

.6 Adjacent Occupied Areas: Where interference with use of adjoining areas or interruption of free passage to adjoining areas is unavoidable, coordinate cutting and patching according to requirements in Section 01 10 00 - Summary of Work.

.7 Existing Utility Services and Mechanical/Electrical Systems: Where existing services/systems are required to be removed, relocated, or abandoned, bypass such services/systems before cutting to minimize interruption to occupied areas.

.8 Cutting: Cut in-place construction by sawing, drilling, breaking, chipping, grinding, and similar operations, including excavation, using methods least likely to damage elements retained or adjoining construction. If possible, review proposed procedures with original Installer; comply with original Installer's written recommendations.
   .1 In general, use hand or small power tools designed for sawing and grinding, not hammering and chopping. Cut holes and slots neatly to minimum size required, and with minimum disturbance of adjacent surfaces. Temporarily cover openings when not in use.
   .2 Finished Surfaces: Cut or drill from the exposed or finished side into concealed surfaces.
   .3 Concrete and Masonry: Cut using a cutting machine, such as an abrasive saw or a diamond-core drill.
   .4 Excavating and Backfilling: Comply with requirements in applicable Sections where required by cutting and patching operations.
   .5 Mechanical and Electrical Services: Cut off pipe or conduit in walls or partitions to be removed. Cap, valve, or plug and seal remaining portion of pipe or conduit to prevent entrance of moisture or other foreign matter after cutting.
   .6 Proceed with patching after construction operations requiring cutting are complete.

.9 Patching: Patch construction by filling, repairing, refinishing, closing up, and similar operations following performance of other work. Patch with durable seams that are as invisible as practicable. Provide materials and comply with installation requirements specified in other Sections, where applicable.
   .1 Inspection: Where feasible, test and inspect patched areas after completion to demonstrate physical integrity of installation.
   .2 Exposed Finishes: Restore exposed finishes of patched areas and extend finish restoration into retained adjoining construction in a manner that will minimize evidence of patching and refinishing.
      .1 Clean piping, conduit, and similar features before applying paint or other finishing materials.
      .2 Restore damaged pipe covering to its original condition.

.3 Floors and Walls: Where walls or partitions that are removed extend one finished area into another, patch and repair floor and wall surfaces in the new space. Provide an even surface of uniform finish, colour, texture, and appearance. Remove in-place floor and wall coverings and replace with new materials, if necessary, to achieve uniform colour and appearance.

.1 Where patching occurs in a painted surface, prepare substrate and apply primer and intermediate paint coats appropriate for substrate over the patch, and apply final paint coat over entire unbroken surface containing the patch. Provide additional coats until patch blends with adjacent surfaces.

.4 Ceilings: Patch, repair, or rehang in-place ceilings as necessary to provide an even-plane surface of uniform appearance.

.5 Exterior Building Enclosure: Patch components in a manner that restores enclosure to a weathertight condition and ensures thermal and moisture integrity of building enclosure.

.10 Cleaning: Clean areas and spaces where cutting and patching are performed. Remove paint, mortar, oils, putty, and similar materials from adjacent finished surfaces.

End of Section

PART 1 GENERAL

1.1 Section Includes

.1 Progressive Cleaning
.2 Final Cleaning

1.2 Project Cleanliness

.1 Maintain Work in tidy condition, free from accumulation of waste products and debris.

.2 Remove waste materials from site at daily regularly scheduled times or dispose of as directed by the Owner. Do not burn waste materials on site.

.3 Clear snow and ice from access to building, bank/pile snow in designated areas only.

.4 Make arrangements with and obtain permits from authorities having jurisdiction for disposal of waste and debris.

.5 Provide on-site containers for collection of waste materials and debris.

.6 Provide and use clearly marked separate bins for recycling.

.7 Clean interior areas prior to start of finishing work and maintain areas free of dust and other contaminants during finishing operations.

.8 Store volatile waste in covered metal containers and remove from premises at end of each working day.

.9 Provide adequate ventilation during use of volatile or noxious substances. Use of building ventilation systems is not permitted for this purpose.

.10 Schedule cleaning operations so that resulting dust, debris and other contaminants will not fall on wet, newly painted surfaces nor contaminate building systems.

PART 2 PRODUCTS

2.1 Products

.1 All cleaning materials and products shall be low VOC type. Submit list of cleaning products including SDS for approval prior to commencement of cleaning operations.

.2 Use only cleaning materials recommended by manufacturer of surface to be cleaned and recommended by cleaning material manufacturer.

PART 3 EXECUTION

3.1 Final Cleaning

.1 When Work is Substantially Performed remove surplus products, tools, construction machinery and equipment not required for performance of remaining Work.

.2 Remove waste products and debris other than that caused by others and leave Work clean and suitable for occupancy.

.3 Clean and polish glass, mirrors, hardware, wall tile, stainless steel, chrome, porcelain enamel, baked enamel, plastic laminate, and mechanical and electrical fixtures. Replace broken, scratched or disfigured glass.

.4 Remove stains, spots, marks and dirt from decorative work, electrical and mechanical fixtures, furniture fitments, walls, floors and ceilings.

.5 Clean lighting reflectors, lenses, and other lighting surfaces.

.6 Vacuum clean and dust building interiors, behind grilles, louvres and screens.

.7 Wax, seal, shampoo or prepare floor finishes, as recommended by manufacturer.

.8 Inspect finishes, fitments and equipment and ensure specified workmanship and operation.

.9 Clean equipment and fixtures to a sanitary condition; clean or replace filters of mechanical equipment.

.10 Broom clean and wash exterior paved areas, walks, steps and surfaces; rake clean other surfaces of grounds.

.11 Remove dirt and other disfiguration from exterior surfaces.

.12 Clean and sweep roofs. Clear all drains.

.13 Remove debris and surplus materials from crawl areas and other accessible concealed spaces.

.14 Remove snow and ice from access to building.

End of Section

PART 1 GENERAL

1.1 Section Includes

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

1.2 References

.1 O. Reg. 102/94, Waste Audits and Waste Reduction Work Plans.
.2 O. Reg. 278/05, Occupational Health and Safety Act

1.3 Submittals

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

.2 Submit a completed Waste Management Plan (WMP) including Waste Reduction Workplan (WRW) and Materials Source Separation Program description prior to project start-up.

1.4 Definitions

.1 Waste Management Plan (WMP): Contractor's approved overall strategy for waste management including waste audit, waste reduction workplan and materials source separation program.

.2 Waste Audit (WA): Relates to projected waste generation. Involves measuring and estimating quantity and composition of waste, reasons for waste generation, and operational factors which contribute to waste.

.3 Waste Reduction Work Plan (WRW): Written report which addresses opportunities for reduction, reuse, or recycling of materials. WRW is based on information acquired from WA.

.4 Materials Source Separation Program (MSSP): Consists of a series of ongoing activities to separate reusable and recyclable waste material into material categories from other types of waste at point of generation.

.5 Waste Management Coordinator (WMC): Designate individual who is in attendance on-site, full-time. Designate, or have designated, individuals from each Subcontractor to be responsible for waste management related to their trade and for coordinating activities with WMC.

.6 Separate Condition: Refers to waste sorted into individual types.

1.5 Waste Management Goals for the Project

.1 The Owner has established that this Project shall generate the least amount of waste possible and that processes shall be employed that ensure the generation of as little waste as possible including prevention of damage due to mishandling, improper storage, contamination, inadequate protection or other factors as well as minimizing over packaging and poor quantity estimating.

.2 Of the waste that is generated, the waste materials designated in this specification shall be salvaged for reuse and or recycling. Waste disposal in landfills or incinerators shall be minimized.

1.6 Documents

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

1.7 Waste Management Plan

.1 Waste Management Plan: Within 10 calendar days after receipt of Notice of Award of Contract, or prior to any waste removal, whichever occurs sooner, submit a Waste Management Plan. The Plan shall contain the following:
.1 Analysis of the proposed job site waste to be generated, including the types of recyclable and waste materials generated (by volume or weight). In the case of demolition, a list of each item proposed to be salvaged during the course of the project should also be prepared
.2 Alternatives to Land Filling: Contractor shall designate responsibility for preparing a list of each material proposed to be salvaged, reused, or recycled during the course of the Project.

.2 Post WMP or summary where workers at site are able to review its content.

1.8 Waste Audit

.1 Prepare Waste Audit prior to project start-up.

.2 Record, on Waste Audit , extent to which materials or products used consist of recycled or reused materials or products

1.9 Waste Reduction Work Plan

.1 Prepare WRW prior to project start-up.

.2 Reduce construction and demolition waste in compliance with O. Reg. 102/94.

.3 Reduction will involve action to minimize quantity of waste at source. Reuse products which would become waste where practical. Recycling will involve collection and source separation at the site, of materials for use as feedstock in manufacturing of new products.

.4 Conform to local Municipal and Regional Landfill Solid waste management requirements. Consider reduction, reuse and recycling of waste generated during construction such as dimensional lumber, clean drywall, concrete, brick, scrap metal and corrugated cardboard.

1.10 Materials Source Separation Program

.1 The Waste Management Plan shall include a Source Separation Program for recyclable waste, and shall be in accordance with the established policies currently in place at the local Municipality, and the requirements of O. Reg. 102/94.

.2 Prepare MSSP and have ready for use prior to project start-up.

.3 Implement MSSP for waste generated on project in compliance with approved methods and as approved by Consultant.

.4 Provide on-site facilities for collection, handling, and storage of anticipated quantities of reusable and/or recyclable materials.

.5 Provide containers to deposit reusable and/or recyclable materials.

.6 Locate containers to facilitate deposit of materials without hindering daily operations.

.7 Locate separated materials in areas which minimize material damage.

.8 Collect, handle, store on-site, and transport off-site, salvaged materials in separate condition.

1.11 Disposal of Wastes

.1 Make arrangements with and obtain permits from authorities having jurisdiction for disposal of waste and debris.

.2 Provide appropriate on-site containers for collection of waste materials and debris.

.3 Provide and use clearly marked separate bins for recycling.

.4 Remove waste materials from site at regularly scheduled times or dispose of as directed by Consultant. Do not burn waste materials on site.

.5 Remove waste material and debris from site and deposit in waste container at end of each working day.

.6 Do not permit waste to accumulate onsite.

.7 Burying of rubbish and waste materials is prohibited.

.8 Disposal of waste into waterways, storm, or sanitary sewers is prohibited.

1.12 Scheduling

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

1.13 Storage, Handling and Protection

.1 Store, materials to be reused, recycled and salvaged in locations as directed by Owner.

.2 Materials from building demolition to be salvaged or re-used are to be removed and salvaged.

.3 Unless specified otherwise, materials for removal become Contractor's property.

PART 2 PRODUCTS

2.1 Not Used

.1 Not used

PART 3 EXECUTION

3.1 Application

.1 Do work in compliance with Waste Management Plan.

.2 Handle waste materials not reused, salvaged, or recycled in accordance with appropriate regulations and codes.

.3 Source separate materials to be reused/recycled into specified sort areas.

3.2 Designated Substances

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

3.3 Diversion of Materials

.1 Separate materials from general waste stream and stockpile in separate piles or containers, to approval of Owner, and consistent with applicable fire regulations. Mark containers or stockpile areas. Provide instruction on disposal practices.

.2 On-site sale of materials is not permitted.

End of Section

.

PART 1 GENERAL

1.1 Section Includes

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

1.2 References

.1 Canadian Construction Documents Committee CCDC 2-2008, Stipulated Price Contract including Supplementary Conditions.

.2 OAA/OGCA Document 100 - Recommended procedures regarding Substantial Performance of Construction Contracts and Completion Takeover of Projects.

.3 The Construction Act.

1.3 Inspection and Declaration

.1 Contractor's Inspection: The Contractor shall conduct an inspection of Work, identify deficiencies and defects, and repair as required to conform to Contract Documents. Submit duplicate copies of the deficiency list to the Owner and Consultant.
  .1 Notify Consultant in writing of satisfactory completion of Contractor's Inspection and that corrections have been made.
  .2 Request Consultant's review.

.2 Consultant's Review: Consultant and Contractor will perform review of Work to identify obvious defects or deficiencies. Contractor shall correct Work accordingly.

.3 Completion: submit written certificate that following have been performed:
  .1 Work has been completed and inspected for compliance with Contract Documents.
  .2 Defects have been corrected and deficiencies have been completed.
  .3 Equipment and systems have been tested, adjusted and balanced and are fully operational.
  .4 Certificates required by Boiler Inspection Branch, Fire Commissioner, Utility companies, TSSA and other regulatory agencies have been submitted.
  .5 Operation of systems have been demonstrated to Owner's personnel.
  .6 Work is complete and ready for Final Review by the Consultant.

.4 Final Inspection: when items noted above are completed, request final review of Work by Consultant, and Contractor. If Work is deemed incomplete by the Consultant, complete outstanding items and request re-review.

.5 Declaration of Substantial Performance: when Consultant consider deficiencies and defects have been corrected and it appears requirements of Contract have been substantially performed, make application for certificate of Substantial Performance. Refer to CCDC 2, General Conditions Article GC 5.4 - Substantial Performance of Work and the Construction Act for specifics to application.

.6 Commencement of Lien and Warranty Periods: date of Owner's acceptance of submitted declaration of Substantial Performance shall be date for commencement for warranty period and commencement of lien period unless required otherwise by lien statute of Place of Work.

.7 Final Payment: When Consultant considers final deficiencies and defects have been corrected and it appears requirements of Contract have been totally performed, make application for final payment. Refer to CCDC 2, General Conditions Article GC 5.7 for specifics to application.

.8 Payment of Holdback: After issuance of certificate of Substantial Performance of Work, submit an application for payment of holdback amount in accordance with CCDC 2, General Conditions Article 5.5

PART 2 PRODUCTS

2.1 Not Used

.1 Not used

PART 3 EXECUTION

3.1 Not Used

.1 Not used

End of Section

.

PART 1 GENERAL

1.1 Section Includes

.1 As built, samples, and specifications.
.2 Equipment and systems.
.3 Product data, materials and finishes, and related information.
.4 Operation and maintenance data.
.5 Spare parts, special tools and maintenance materials.
.6 Warranties and bonds.
.7 Final site survey.

1.2 Submittals

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

1.3 Submission

.1 Prepare instructions and data using personnel experienced in maintenance and operation of described products.

.2 At least 2 weeks prior to commencement of scheduled commissioning activities, submit 2 copies of the draft Operating and Maintenance Manuals, for Consultants review and use during the commissioning activities. After the completion of the commissioning activities, the Consultant will return to the Contractor 1 draft copy, with review comments, for revision. Submit 1 copy of the revised Operating and Maintenance for approval prior to the production of final copies. Prior to the Issuance of the Final Certificate of Completion, and within 10 working days after Substantial Performance, submit 2 copies of the final Operating and Maintenance Manuals.

.3 Building will not be deemed ready for use unless the draft copies of the Operating and Maintenance Manuals and the "As-built" Record Documents have been submitted and reviewed by the Consultant.

.4 Building will not be deemed ready for use unless the completed and submitted Operating and Maintenance Manuals and "As-built" Record Documents have been accepted by the Consultant.

.5 Ensure spare parts, maintenance materials and special tools provided are new, undamaged or defective, and of same quality and manufacture as products provided in Work.

.6 If requested, furnish evidence as to type, source and quality of products provided.

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

1.4 Format

.1 Organize data in the form as instructional manual.

.2 Binders: vinyl, hard covered, 3 'D' ring, loose leaf 219 x 279 mm with spine and face pockets.

.3 When multiple binders are used correlate data into related consistent groupings. Identify contents of each binder on spine.

.4 Cover: identify each binder with type or printed title 'Project Record Documents'; list title of project and identify subject matter of contents.

.5 Arrange content by Section numbers and sequence of Table of Contents.

.6 Provide tabbed fly leaf for each separate product and system, with typed description of product and major component parts of equipment.

.7 Text: manufacturer's printed data, or typewritten data.

.8 Drawings: provide with reinforced punched binder tab. Bind in with text; fold larger drawings to size of text pages.

.9 Provide 1:1 scaled CAD files in .dwg format on CD.

1.5 Contents Each Volume

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

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

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

.4 Drawings: supplement product data to illustrate relations of component parts of equipment and systems, to show control and flow diagrams.

.5 Typewritten Text: as required to supplement product data. Provide logical sequence of instructions for each procedure, incorporating manufacturer's instructions specified in Section 01 45 00 - Quality Control

1.6 Occupant Manual

.1 Submit Occupant Manual to Consultant’s requirements.

.2 Occupant Manual to include:
  .1 General building information.
  .2 Building management.
  .3 Building operations.
  .4 Safety.
  .5 Security.
  .6 Environmental considerations.
  .7 Communications.
  .8 Contact List.
  .9 Other/Miscellaneous.

1.7 As Builts and Samples

.1 In addition to requirements in General Conditions, maintain at the site for Consultant one record copy of:
- .1 Contract Drawings.
- .2 Specifications.
- .3 Addenda.
- .4 Change Orders and other modifications to Contract.
- .5 Reviewed shop drawings, product data, and samples.
- .6 Field test records.
- .7 Inspection certificates.
- .8 Manufacturer's certificates.

.2 Store record documents and samples in field office apart from documents used for construction. Provide files, racks, and secure storage.

.3 Label record documents and file in accordance with Section number listings in List of Contents of this Project Manual. Label each document "PROJECT RECORD" in neat, large, printed letters.

.4 Maintain record documents in clean, dry and legible condition. Do not use record documents for construction purposes.

.5 Keep record documents and samples available for inspection by Consultant.

1.8 Recording Actual Site Conditions

.1 Record information on set of drawings, provided by Consultant.

.2 Record information concurrently with construction progress. Do not conceal Work until required information is recorded.

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

.4 Submit following drawings:
- .1 Record changes in red. Mark on one set of prints and at completion of project prior to final inspection, produce electronic “as-built” records on disk using latest version of AutoCad. Annotate “AS-BUILT RECORD” in each drawing title block.
- .2 All changes shall be shown on a separate drawing layer named "as-built".
- .3 At least 2 weeks prior to commencement of scheduled commissioning activities, submit one copy of the draft “As-built” Project Record Documents for Consultants review and use during the commissioning activities. After the completion of the commissioning activities, the Consultant will return to the Contractor the draft copy, with review comments, for revision.

Prior to the Issuance of the Final Certificate of Completion, and within 10 working days after Substantial Performance, submit 2 copies of the final “As-built” Project Record Documents and disk of “as-built” record drawings.

.5 Specifications: legibly mark each item to record actual construction, including:
.1 Manufacturer, trade name, and catalogue number of each product actually installed, particularly optional items and substitute items.
.2 Changes made by Addenda and change orders.

.6 Other Documents: maintain manufacturer's certifications, inspection certifications, field test records, required by individual specifications sections

1.9 Final Survey

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

1.10 Equipment and Systems

.1 Each Item of Equipment and Each System: include description of unit or system, and component parts. Give function, normal operation characteristics, and limiting conditions. Include performance curves, with Engineering data and tests, and complete nomenclature and commercial number of replaceable parts.

.2 Panel board circuit directories: provide electrical service characteristics, controls, and communications.

.3 Include installed colour coded wiring diagrams.

.4 Operating Procedures: include start-up, break-in, and routine normal operating instructions and sequences. Include regulation, control, stopping, shut-down, and emergency instructions. Include summer, winter, and any special operating instructions.

.5 Maintenance Requirements: include routine procedures and guide for trouble-shooting; disassembly, repair, and reassembly instructions; and alignment, adjusting, balancing, and checking instructions.

.6 Provide servicing and lubrication schedule, and list of lubricants required.

.7 Include manufacturer's printed operation and maintenance instructions.

.8 Include sequence of operation by controls manufacturer.

.9 Provide original manufacturer's parts list, illustrations, assembly drawings, and diagrams required for maintenance.

.10 Provide installed control diagrams by controls manufacturer.

.11 Provide Contractor’s co-ordination drawings, with installed colour coded piping diagrams.

.12 Provide charts of valve tag numbers, with location and function of each valve, keyed to flow and control diagrams.

.13 Provide list of original manufacturer's spare parts, current prices, and recommended quantities to be maintained in storage.

.14 Include test and balancing reports as specified in Section 01 45 00 - Quality Control

.15 Additional requirements: as specified in individual specification sections.

1.11 Materials and Finishes

.1 Building Products, Applied Materials, and Finishes: include product data, with catalogue number, size, composition, and colour and texture designations.

.2 Instructions for cleaning agents and methods, precautions against detrimental agents and methods, and recommended schedule for cleaning and maintenance.

.3 Moisture-Protection and Weather-Exposed Products: include manufacturer's recommendations for cleaning agents and methods, precautions against detrimental agents and methods, and recommended schedule for cleaning and maintenance.

.4 Additional Requirements: as specified in individual specifications sections.

1.12 Spare Parts

.1 Provide spare parts, in quantities specified in individual specification sections.

.2 Provide items of same manufacture and quality as items in Work.

.3 Spare parts as identified in individual sections are to be delivered to the Owner prior to the Contractor’s application for Substantial Performance.

.4 Receive and catalogue items. Submit inventory listing to Consultant. Include approved listings in Maintenance Manual.

.5 Obtain receipt for delivered products and submit prior to final payment.

1.13 Maintenance Materials

.1 Provide maintenance and extra materials, in quantities specified in individual specification sections.

.2 Provide items of same manufacture and quality as items in Work.

.3 Maintenance materials are to be delivered to the Owner prior to the Contractor’s application for Substantial Performance.

.4 Receive and catalogue items. Submit inventory listing to Consultant. Include approved listings in Maintenance Manual.

.5 Obtain receipt for delivered products and submit prior to final payment.

1.14 Special Tools

.1 Provide special tools, in quantities specified in individual specification section.

.2 Provide items with tags identifying their associated function and equipment.

.3 Special tools are to be delivered to the Owner prior to the application for Substantial Performance.

.4 Receive and catalogue items. Submit inventory listing to Consultant. Include approved listings in Maintenance Manual.

1.15 Storage, Handling and Protection

.1 Store spare parts, maintenance materials, and special tools in manner to prevent damage or deterioration.

.2 Store in original and undamaged condition with manufacturer's seal and labels intact.

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

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

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

1.16 Warranties and Guarantees

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

.2 List subcontractor, supplier, and manufacturer, with name, address, and telephone number of responsible principal.

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

.4 Except for items put into use with Owner's permission, leave date of beginning of time of warranty until the Date of Substantial Performance is determined.

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

.6 Co-execute submittals when required.

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

1.17 Independent Specialty Engineers Sign-Off

.1 Prior to Substantial Performance, provide copies of signed and stamped engineers review and sign-off letters stating that the work has been built in accordance with their drawings and designs. Conditional or vague letters of sign-off will not be accepted. All specialty design engineers for all sub-contractors and suppliers will be required to review the work in progress at appropriate intervals to ensure compliance with their designs and drawings and shall provide final sign-off letters. Provide copies of all field reports issued by specialty engineers. Carry all costs associated with full compliance with this requirement.

PART 2 PRODUCTS

2.1 Not Used

.1 Not used

PART 3 EXECUTION

3.1 Not Used

.1 Not used

End of Section

PART 1 GENERAL

1.1 Section Includes

.1 Procedures for demonstration and instruction of equipment and systems to Owner's personnel.

1.2 Description

.1 Demonstrate operation and maintenance of equipment and systems to Owner's personnel two (2) weeks prior to date of Substantial Performance.

.2 Owner will provide list of personnel to receive instructions and will co-ordinate their attendance at agreed-upon times.

1.3 Quality Control

.1 When specified in individual Sections require manufacturer to provide authorized representative to demonstrate operation of equipment and systems, instruct Owner's personnel, and provide written report that demonstration and instructions have been completed.

1.4 Submittals

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

.2 Submit schedule of time and date for demonstration of each item of equipment and each system two weeks prior to designated dates, for Owner's approval.

.3 Submit reports within one week after completion of demonstration, that demonstration and instructions have been satisfactorily completed.

.4 Give time and date of each demonstration, with list of persons present.

1.5 Conditions for Demonstrations

.1 Equipment has been inspected and put into operation.

.2 Testing, adjusting, and balancing have been performed and equipment and systems are fully operational.

.3 Provide copies of completed operation and maintenance manuals for use in demonstrations and instructions.

1.6 Preparation

.1 Verify that conditions for demonstration and instructions comply with requirements.

.2 Verify that designated personnel are present.

1.7 Demonstrations and Instructions

.1 Demonstrate start-up, operation, control, adjustment, troubleshooting, servicing, and maintenance of each item of equipment at scheduled times.

.2 Instruct personnel in phases of operation and maintenance using operation and maintenance manuals as basis of instruction.

.3 Review contents of manual in detail to explain aspects of operation and maintenance.

.4 Prepare and insert additional data in operations and maintenance manuals when need for additional data becomes apparent during instructions.

PART 2 PRODUCTS

2.1 Not Used

.1 Not used

PART 3 EXECUTION

3.1 Not Used

.1 Not used

End of Section

PART 1 GENERAL

1.1 General

.1 The Contractor must retain and pay the services of a competent and permanent commissioning coordinator. The commissioning coordinator must have a minimum of two years of experience in commissioning. Submit for approval the name, qualifications, and experience of the coordinator.

.2 This coordinator will not be removed from the work site without a valid reason and prior written approval.

.3 It is the responsibility of the Contractor to ensure that he and his Sub-Contractors have the skills, availability, capabilities, tools, and manpower needed to carry out the commissioning work as prescribed in the specification, while respecting the work schedule and the project deadlines.

1.2 Submittals

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

.2 Product Data:
  .1 Provide manufacturer's printed product literature and datasheets for insulation and adhesives, and include product characteristics, performance criteria, physical size, finish and limitations.

.3 Certificates: submit certificates signed by manufacturer certifying that materials comply with specified performance characteristics and physical properties.

.4 Provide operation, maintenance and engineering data for incorporation into manual specified in Section 01 78 00 – Closeout Submittals.

.5 Operation and Maintenance Data: submit operation and maintenance data for incorporation into manual.

1.3 Objectives

.1 The main objective of a commissioning process is to ensure that the delivered building is achieved according to the planned concept, in accordance with the contractual documents, and that the building Owner has the guarantee that all systems were checked systematically and function properly.

.2 The Contractor’s person responsible for the commissioning must collaborate for the commissioning process and its implementation and must ensure the operation of the equipment and the systems, their corrective maintenance, the execution of necessary adjustments, and completion of the documentation. Contractor collaboration applies, without being limited to, to the following items:
  .1 Respecting the customer’s requirements and the performance criteria established by the designer, as described in the specification. The responsible Contractor must report any problematic installation or situation that could affect the performance and operation of the system.
  .2 During these verifications and controls, make necessary adjustments to achieve a level of performance satisfying the environmental requirements and the needs of the user.

.3 Operate the systems to their full capacity and in all modes of operation to determine if they are working properly to meet optimum performance. The systems must function in interaction, according to the project plan and in accordance with the requirements of the contractual documents and design criteria.

.3 The commissioning of the systems is a coordinated program of tests, verifications and documentation applied systematically to project's equipment and integrated systems.

.4 This phase is carried out when all the equipment and systems have been installed and have started operating simultaneously, and not sequentially. The operation must be in "automatic" mode and in accordance with the operating sequences. The Contractor must complete the systems' performance control and this control must be approved by the designers. The main tasks of the systems' commissioning are:
.1 Ensuring that equipment and integrated systems are functioning as required by the contractual documents, design criteria and according to the design intent.
.2 Ensuring that all documentation required relating to the commissioning was attached in the building operation and maintenance manual.
.3 Ensuring that the training of operation and maintenance personnel is complete and meets their needs.

1.4 Roles and Responsibilities of the Stakeholders

.1 The commissioning process requires, on the part of all stakeholders in the project, a good understanding of the range of actions they need to do to ensure the quality of the work. Additionally, a rigorous follow-up of the tests and inspections must be performed at each stage of the commissioning.

.2 Roles and responsibilities of stakeholders in the commissioning process.
.1 The commissioning process involves the stakeholders identified below:
.1 The Owner's representative (PM):
.1 The representative has the overall responsibility for project management and is the client's only contact person. He participates in the documentation of the Owner's requirements regarding the project.
.2 The consultants (C):
.1 The consultants design and oversee the installation respecting the client's functional, technical, and operational requirements and the budget. They prepare work documents, including the commissioning documents in construction specifications and document the basic design principles at the beginning of the "concept" phase. During their routine examinations, the consultants will share their comments on the acceptability of installations as they are installed, and in particular, will validate the test results of completed systems.
.3 Commissioning authority (CxA):
.1 Fundamental and best practice commissioning:
.1 The commissioning authority revises the Owner's requirements document and the consultant's design intent, prepares the list of equipment involved in the commissioning and ensures the implementation of all activities relating to the fundamental and best practice commissioning, so as to deliver a project fully operational in all aspects. In fact, the commissioning authority validates that the documentation is complete, the system performance, reliability, durability, accessibility, maintenance, and operational effectiveness, under all operating conditions, are tested and approved, and that the protection of health, well-being, safety, and comfort of the occupants and operation and maintenance personnel (O & M) are respected.

.2 The commissioning authority conducts a design review before the phase of the preparation of the construction documents and the documents provided by the Contractor for the commissioned equipment. At the end of the construction, the commissioning authority conducts a verification of the performance of systems targeted by the commissioning, completes the commissioning report and a systems manual, and hands them to the Owner when he takes possession of the building. At the same time, a contract for the revisionary assessment of the systems' operation is established between the commissioning authority and the Owner.

.4 Construction team (CT):

.1 The team is comprised of the general Contractor, the specialized Contractors, the suppliers, and various trades. The team is responsible for the construction / installation in compliance with the contract documents, the execution of the tests, the provision of training, and providing all documents required for the project.

.1 Specialized Contractor's person responsible for the commissioning.

.1. Under the project, each Contractor identifies a person in charge of commissioning. Those responsible for commissioning participate in commissioning meetings and prepare each system for the start-up and commissioning operations, fill in the installation sheets of all equipment / systems requested in the specification, conduct, attest, certify and document tests, calibrations, and adjustments, provide the necessary instruments to operate tests, adjustments, and calibrations and remove them at the end of operations, participate in the demonstration of targeted system's operation according to the schedule planned during the system commissioning stage, prepare the building operation and maintenance manuals, and coordinate and ensure that training sessions are held, as indicated in the specification and according to the commissioning process requirements.

.2 Commissioning coordinator:

.1. The coordinator handles the coordination of the commissioning together with the commissioning authority and the each specialized Contractor's responsible person. The coordinator gathers and reviews the documents for tests, adjustments, and calibrations of mechanical and electrical systems of all entrepreneurs. In addition, the coordinator is responsible for producing and updating the commissioning schedule, and this way, coordinates the presence of Contractors required for each test.

.2. The coordinator ensures the realization of the commissioning plan and that the performance verification of all installed systems was carried out by those responsible for the commissioning representing each specialized Contractor. The coordinator is responsible for the implementation of training programs and must be available to provide an emergency service and corrective maintenance during the first year of occupation by the user to make adjustments and modifications, which are not part of responsibilities of the operation and maintenance personnel.

1.5 Commissioning Process

.1 The commissioning process is part of the implementation phases of the construction project which are: concept, design, invitation for tenders/awarding of contract, construction, commissioning systems, and building operation.

.2 Concept phase:
.1 The operational and technical program is developed by the Owner and must contain commissioning requirements. The consultant documents the design intent. The scope of work and the budget allocated for commissioning are then determined. A first draft of the commissioning plan is established.

.3 Design phase (plans and specifications):
.1 The commissioning authority conducts a review of the Owner's requirements and design intent. Commissioning requirements are incorporated into the design documents, including training and warranties. The requirements in relation to training and are introduced and defined in the design documents. Just before the invitation to tender, the commissioning authority (CxA) conducts a review of design documents relative to the requirements of the Owner and submits a report to the consultant and the Owner. Submissions are then received and the Contractors selected, including the commissioning coordinator retained by the general Contractor.

.4 Construction phase:
.1 The consultant (C) specifies the scope of the commissioning and details the list of the equipment / systems included in the commissioning. The commissioning authority organizes meetings with other members of the commissioning team to review everyone's' roles and responsibilities, define a communications protocol, and become acquainted with the commissioning plan. As the installation progresses, each specialized Contractors' persons responsible for commissioning fill in the installation verification sheets and transmit them to the consultant (C). These persons develop test procedures (start-up operation) for each piece of equipment and network system. The coordinator produces the commissioning schedule. After acceptance by the consultants and validation of the compliance of the installation and start-up sheets, the systems' commissioning can begin.

.5 Systems' commissioning phase:
.1 Each specialized Contractors' persons responsible for commissioning conduct the tests (trials, adjustments, and calibrations) necessary to demonstrate the achievement of performance levels required of each system. The commissioning coordinator gathers all test documents and provides them to the consultant (C). The tests will have to be checked and approved by the consultant (C) and the reports of these tests are transmitted to the commissioning authority for validation. The commissioning authority conducts a verification of the operational performance of the systems targeted by the commissioning during the integrated operation of all systems.
.2 The general Contractor's commissioning coordinator (manager) produces operation and maintenance manuals. Once the operation start-ups are completed, those responsible for commissioning ensure that the training provided to the operators and the building users meet the requirements of the specification and the commissioning. They complete the documents related to training (lists, reports) and give them to the commissioning authority (CxA).
.3 The final commissioning report, as well as the systems manual, are completed by the CxA and returned to the Owner.

.6 Operation phase:
.1 The CxA attends certain training sessions to ensure the compliance of the sessions' content with the specification requirements. Tests in the opposite season (with respect to the season of the construction completion) must be completed to confirm the operation of systems at full cooling or heating load, as appropriate. Mid-season tests may be required, depending on the commission's mandate.

.7 Commissioning scope:
.1 When the mandate is granted, the list of equipment, systems or elements that will be the subject of commissioning is established. This list does not restrict the required tests in the specialized sections of the specification, but defines what elements will be established in the commissioning process. The following list is not exhaustive and is shown as an example:
.1 Mechanical:
.1 Pumps, plumbing accessories, and water inlets.
.2 Sanitary fixtures.
.3 Heating and cooling systems.
.4 Piping.
.5 Boilers.
.6 HVAC systems and terminal units.
.7 Domestic water heaters.
.2 Electrical:
.1 Power distribution center.
.2 Circuit breaker.
.3 Lighting distribution panel.
.4 Fused / non-fused disconnect.
.5 Power cables.
.6 Engine starter
.7 Motor control center.
.8 Output lighting patterns.
.9 Programmable light control system.
.10 Automatic power inverter.
.11 Electric heating.
.3 Controls:
.1 Control devices and instrumentation.
.2 Systems to be tested compliant to the codes:
.1 When tests are required as part of a regulatory process, the commissioning authority must ensure that all these tests are performed. It is the responsibility of the design team to certify these tests as part of their quality assurance role.

1.6 Commissioning Plan – Details

.1 Commissioning plan:
.1 The following section represents in tabular form the detailed steps of the commissioning process to be performed during the project and the allocation of responsibilities to members of the commissioning team.
.2 This table is used as a commissioning plan, it contains all the tasks to perform, activities to complete, and deliverables to meet.
.3 To facilitate understanding, the contents of the table were separated according to the main phases of the project, namely: concept, design, invitation for tenders / awarding of contract, construction, commissioning, operation / maintenance.

.2 Plan updates:
.1 During the construction phase, the commissioning plan will be reviewed, amended and updated so that it states:
.1 Resulting modifications due to client program changes.
.2 Approved changes with respect to the design and construction characteristics.
.3 The progress of commissioning work and activities.

.2 Every time the plan is revised, the revision number and date must be updated. The revised commissioning plan must be submitted to the Owner. Subsequently, the revised commissioning plan is submitted to the various stakeholders by clearly identifying the items modified for review and verification.

PM	Project Manager/Client representative
C	Consultants
CxA	Commissioning authority (commissioning specialist)
CT	Construction team (entity of Contractors, Sub-Contractors, and Coordinator)
Op	Operating client, operation personnel

	ACTIVITIES AND DEFINITION OF TASK	STAKEHOLDERS				
		PM	C	CxA	CT	Op
	Concept Phase					
1.	Appointment of the commissioning specialist.	X				
2.	Grouping of the Owner's requirements.	X		X		
3.	Development of the design concept.		X			
4.	Revision of the design concept relating to the Owner's requirements.			X		
5.	Development of the commissioning plan.			X		
	Documents and Deliverables					
1.	Owner's requirements document.			X		
2.	Mechanical and electrical concept bases report		X			
3.	Report of the review of the concept bases relating to the Owner's requirements.			X		
4.	Commissioning plan.			X		
	Plan and Specification Phase					
1.	Writing the specification and preparing the plans.		X			
2.	Incorporation of the specific clauses related to the commissioning process and the required documentation to the specification.			X		
3.	Specification of the methods and acceptable ranges for all tests (pressure, leak, performance, etc.) to be done in the factory, laboratory, or on-site during the construction phase and during the commissioning phase		X			
4.	Enumeration of the performance tests during commissioning with acceptable tolerances relative to the specified performance test.		X			
	Verification of the compliance of tests and criteria in relation to the commissioning requirements.			X		
	Incorporation to the project specification.		X			
5.	Establishment of requirements relating to measurement instruments and adjustment and calibration devices for commissioning.		X			
	– Review and approval.			X		
6.	Review of plans and specifications to validate the following items:					
	– The design criteria and the intent of the design are respected.			X		
	– All the factory and worksite tests.		X			
	– The description of the entirety of the commissioning tests and activities and the acceptable commissioning tolerances.		X			
	– The description of the entirety of the commissioning documentation required.		X			
	– All documents required for maintenance contracts during the warranty period.		X			
	– The list of all special tools, spare parts, and maintenance		X			

	ACTIVITIES AND DEFINITION OF TASK	STAKEHOLDERS				
		PM	C	CxA	CT	Op
	equipment.					
	– The commissioning plan with the team's distribution of responsibilities			X		
7.	Establishment of O & M staffing requirements: identification of labour needs and the required qualifications.	X	X			
8.	Development of a comprehensive training program for the O & M personnel.		X			
9.	Review and inspection of documents prior to issuing them for construction: compliance of commissioned items in regard to the Owner's requirements, functionality, energy efficiency, water consumption, ease of maintenance, durability, cost of purchase, quality of the indoor environment, and local environmental impacts.			X		
Documents and Deliverables						
1.	Commissioning requirements to be included in the specification.			X		
2.	Report for the revision / inspection of the construction documents.			X		
	Invitation for Tender and Award of Contract Phase					
1.	(Before the invitation for tender): Review of tender documents to ensure:					
	– That they comply with the Owner's requirements (functional and technical program, if applicable.)	X	X			
	– That the errors and omission were reduced to a minimum.	X	X			
	– That the allocation of the requested prices is adequate.	X				
2.	(After the invitation for tender): Review of the addenda issued during the bidding period to determine the impact on the commissioning, maintenance and operation.		X			
3.	Replies to the bidders.		X			
4.	Evaluation of the Contractors' tenders for systems involved in commissioning, especially with respect to the Owner's requirements and the design intent. Transmission of the report to the consultants and the Owner.			X		
Documents and Deliverables						
1.	Review report of the Contractors' documents.			X		
	Construction Phase					
1.	Gather the commissioning team and hold one or more meetings in order to:					
	– Identify each Contractors' persons responsible for the commissioning.				X	
	– Produce the organization chart of the commissioning team.			X		
	– Review the commissioning plan with the stakeholders: roles / responsibilities, documentation, deliverables, schedule, training.			X		
	– Identify the management and communication modes for all aspects of the commissioning, the frequency of meetings, and the logistics.			X		
2.	Confirmation commissioning scope.					
	– Expand the list of systems and equipment that are targeted by the commissioning. If necessary, complete the preliminary list in the commissioning specification.			X		
3.	Establishment of a preliminary commissioning schedule.					
	– Preparation.				X	
	– Validation			X		

	ACTIVITIES AND DEFINITION OF TASK	STAKEHOLDERS				
		PM	C	CxA	CT	Op
4.	Examine the shop drawings and specifications to verify their compliance with the contractual documents and their compatibility with the Owner's requirements.					
	- Presentation.				X	
	- Review and verification.		X			
	- Validation			X		
5.	Preparation of installation (commissioning) verification sheets.					
	- Compilation based on the project needs.				X	
	- Entry of relevant data from the shop drawings verified with the commissioning sheets.				X	
	- Revision and validation.			X		
6.	Assembly of the documentation related to the measurement instruments used, the calibration certificates, and the tests performed.					
	- Assembly of the documentation				X	
	- Verification		X			
	- Validation			X		
7.	Preparation of the operation and maintenance manuals.					
	- Assembly				X	
	- Verification/ review		X			
	- Validation			X		
8.	Include the certification of the laboratory test results as part of the commissioning documentation.					
	- Evaluation of the test procedures.		X			
	- Attendance at the tests and certifications.		X			
	- Review.			X		
9.	Training of the operation and maintenance personnel.					
	- Confirmation of the training sessions requested by the operation personnel.					X
	- Preparation of the training plans for each scheduled session.				X	
	- Initiation training: Observation of the systems and equipment during their installation (nearing the end of construction).					X
	- Approval of the training sessions.			X		
10.	Beginning the equipment start-up processes.					
	- Inspection prior to the initial start-up.				X	
	- Documentation of the start-up sheets.				X	
	- Establish the list of deficiencies.		X			
	- Correction of deficiencies				X	
	- Validation.			X		
11.	Update the commissioning plan (if required).			X		
12.	Drafting the systems' performance testing procedures.			X		
	- Validation		X			
Documents and Deliverables						
1.	Commissioning plan update.			X		
2.	Drafting the operation manual (90% at the end of construction).				X	
3.	Assembling the maintenance manual (90% at the end of construction).				X	

	ACTIVITIES AND DEFINITION OF TASK	STAKEHOLDERS				
		PM	C	CxA	CT	Op
4.	Revision of the operations manual according to the changes on-site.				X	
5.	File of the commissioning meeting minutes during the construction period.			X		
	Commissioning Phase					
1.	Commissioning schedule update.				X	
	Review and validation.			X		
2.	Verification during the start-up of the proper operation of the system sequences and functions within the expected limits.					
	- Post start-up deficiencies list.				X	
	- Inspection and compilation of the deficiencies.		X			
	- Correction of the deficiencies.				X	
	- Verification of the corrective measures.		X			
	- Validation.			X		
3.	Equipment started by the equipment manufacturer (must be tested, started and, commissioned by the manufacturer).					
	- Commissioning.				X	
	- Attendance to the tests and certifications.			X		
	- Validation of reports approved by the consultant.			X		
4.	Commissioning of all systems at partial load and to the design conditions.					
	- Commissioning of systems and reporting.				X	
	- Perform functional performance tests of the selected systems.			XX		
	- Document the test results and keep record of questions raised during the functional performance tests.					
	- Verification of the conformity of the results documented in the reports and answers to the questions raised during the testing.		X			
	- Validation of the reports approved by the consultant.			X		
5.	Additional commissioning tests for various equipment that must be tested during different seasons.					
	- Identification of the systems and completion of the tests.				X	
	- Definition of the additional and iterative tests.		X			
	- Review and validation.			X		
6.	Operation manual.					
	- Review for format, content, and completion.			X		
7.	Maintenance manual					
	- Review for format, content, and completion.			X		
8.	Training of the operation and maintenance staff.					
	- Organization of the training sessions.				X	
	- Attendance at training sessions.			X	X	X
	- Provision of training plans with and attendance and signature list.				X	
	- Supervision.			X		
9.	Demonstration to the users that the system operates as intended by the contractual documents.					
	- Demonstration of the systems' performance.				X	
	- Certification		X			
	- Witnesses	X		X		X

ACTIVITIES AND DEFINITION OF TASK		STAKEHOLDERS				
		PM	C	CxA	CT	Op
10.	Development of the systems' manual.			X		
	- Final version of the Owner's requirements and design principles.		X	X		
	- Final sequences of operation for all the systems.				X	
	- Operation instructions for water and energy saving strategies.		X	X		
	- Results of operational performance tests.			X	X	
	- Operation guidelines according to the season.		X	X		
	- Recommendation of the frequency of the calibration for sensors, actuators, etc.				X	
	- Simplified diagrams of each system.		X			
	- Reference table for the Owner's requirements.	X		X		
	- Guidelines for the continuous and preventative maintenance to respect the warranty.		X	X		
Documents and Deliverables						
1.	Complete the operation manual to 100% according to the commissioning information.				X	
2.	Complete the maintenance manual to 100%.				X	
3.	Functional performance tests report.			X		
4.	Produce the final commissioning report (90%).			X		
5.	Complete the systems manual.			X		
	Operation Phase					
1.	Review of the systems and equipment not operating within design parameters.					
	- Find solutions.		X			
	- Review and recommendation.			X		
2.	Verification of the systems and the components ten months after the final acceptance.					
	- Query the appropriate personnel to identify any building operational or maintenance issues.			X		
	- Functional performance testing withe the operation personnel.			X		
	- Identification of deficiencies.			X		
	- Resolution of issues by virtue of the manufacturer's or the Contractor's warranty.				X	
3.	Complete the commissioning report.			X		
Documents and Deliverables						
1.	Updated operating manual, including the changes made during the operation of certain systems.			X		X
2.	Maintenance manual is updated, if necessary.			X		X
3.	Commissioning final report (100%).			X		

1.7 Component Installation Verification

.1 The verification of the installation of components is intended to certify the compliance of the installation of equipment, systems, and major networks. It is carried out by the construction team and covers all components identified by the consultants. It includes, for example, the following verifications.

.1 The verification of the emplacements and accessibility of the equipment, systems, and networks.

.2 The pressure testing of equipment, systems, and networks.
.3 The cleaning and flushing of equipment, systems, and networks.
.4 The lubrication of pieces of equipment, systems, and networks.
.5 The cleaning of ducts, installation of filters, etc. (ventilation systems).
.6 The verification of earthquake resistant elements, of acoustic and vibration elements, etc., for each piece of the equipment, system, and network.
.7 The motor shaft alignments
.8 The verification of the voltage and amperage of the electrical components in
.9 equipment, systems and networks
.10 The verification of each required control points in the regulation and instrumentation system.
.11 The validation of the in-factory tests by the manufacturers on the main equipment and mechanical and electrical components.
.12 Any other verification required to certify the installation of equipment, systems and networks.

.2 The construction team must document this verification during the installation, the startup, the adjustments and calibration of equipment, systems, and networks. The sheets used to document verification can be developed by the specialized Contractor, come from the manufacturer of the equipment (e.g. installation manual), or other sources subject to the approval of the commissioning authority.

1.8 Quality and Performance Control

.1 At the start of the work, the specialized Contractor must submit the names of the personnel designated to perform the tests and appoint a representative who will supervise all testing, adjustments, and / or calibration operations.

.2 Run the test procedures (functional tests) in collaboration with the professionals and the suppliers. The procedures must be clearly described, as well as the expected response of the system or the acceptance criteria of each procedure, the actual response, and all relevant comments.

.3 For each piece of equipment, system, and major network, each operating sequence must be tested. These sequences include start-up, shutdown, manual and out of occupancy hours operating modes, modulation in both directions over the range of operation, power outages, alarms, load shedding and emergency equipment start-up in case of breakdown (equipment and pumps), equipment interlocks, and calibration of sensors and actuators.

.4 Demonstrate the proper functioning of all systems to the commissioning authority and the Owner's representative. The demonstrations must show that the operating sequences required by the specification are functional and that the system meets the needs of the occupants.

.5 All the tests and the controls carried out will be documented. All start-up, trial, test, adjustment, commissioning, etc. reports, must be annexed in the operation manual. A copy of any documentation approved by the designers relating to equipment involved as part of the commissioning is given to the commissioning coordinator who assembles them and then transmits them to the commissioning authority.

1.9 Project Commissioning Documents

.1 The document of the Owner’s requirements.

.2 The basic principles of the design.

.3 The list of systems defining the commissioning scope.

.4 The commissioning plan.

.5 The tracking table of the shop drawings, the samples, and the updated data sheets.

.6 The list of equipment for warranty follow-ups.

.7 The verification sheets of the identified components to which are attached the performance data provided by the manufacturer, the test procedures, the performance test results, and the reports for start-up, trials, tests, settings, etc. These sheets are of type NEBB, BCA or from manufacturing and/or Contractors.

.8 The list of training sessions to provide to the operation personnel.

.9 The plan for each of the training sessions.

.10 The list of replacement equipment, spare parts, and special tools required, with the transfer voucher signed by the Owner.

.11 The systems manual.

.12 The commissioning report.

.13 The building's operation and maintenance manuals. Refer to the format and content requirements of these manuals in the general clauses of each specification section.

.14 All these documents must be properly bound and presented, with separating tabs and in a rigid binder, as prescribed in the general conditions. The different systems are to be presented according to the standardized sections.

1.10 Operation Personnel Training

.1 Training objectives:
  .1 Operation personnel training is to ensure that they have full knowledge of premises and full autonomy to operate all architectural and technical building components.
  .2 When specified, refer to the training requirements found in the different sections of the specification. Otherwise, the training should be sufficiently long and detailed to enable participants to acquire the knowledge and competencies necessary to perform the following:
    .1 Ensure safe, reliable, and cost effective operation, in terms of energy and financial aspects, of all equipment and systems installed in "normal" and "emergency" modes, and for all operating conditions.
    .2 Implement an effective program of continuous inspection and control ofthe equipment's and systems' performance.
    .3 Implement an appropriate program of preventative and corrective maintenance and diagnostics.
    .4 Keep the documentation up to date.
    .5 Ensure operation of equipment and systems in emergency conditions until the arrival of qualified personnel.

.3 Training the operation personnel is a prerequisite for the provisional acceptance of the works. The operation personnel must be able to ensure the management of the building as soon as it is occupied. All training sessions should be performed on fully functional equipment. The list of operation personnel training sessions is followed by the plans for each of the training sessions

.2 Instructional material:
- .1 The instructors are responsible for the content and the quality of the material used for training purposes.
- .2 The instructional material must include the following:
  - .1 Initial start-up documents.
  - .2 Operation and maintenance manuals.
- .3 The project manager, the Contractor's person in charge of the commissioning, and the building Owner will review the manuals and instructional materials
- .4 The manuals and the material used must be prepared in such a way as to allow the same level of detail in subsequent training sessions
- .5 The training documentation must be in English, as well as all brochures, overheads, slides, videos, training software, samples, etc. used.
- .6 The complete technical documentation required for the operation and maintenance of the building must be given to operation personnel before the training sessions to permit them to have some previous exposure to the building and systems, making the training more adapted. This avoids that the training sessions be limited to a presentation of the equipment.

.3 Training schedule:
- .1 Allow time for training in the commissioning schedule. The schedule must be accepted by the professionals at least two weeks in advance to ensure the availability of all participants. The Contractor ensures the coordination of the stakeholders for the training sessions.
- .2 The training sessions must be held during normal working hours and the sessions must be a maximum of three consecutive hours.
- .3 The training must be completed before acceptance of the building/installation.

.4 Participants:
- .1 Personnel responsible for the operation and maintenance of the facility, including the property manager, security personnel and specialized technicians, as applicable.
- .2 Participants must be able to attend sessions training during the last stages of construction in order to become familiar with the installed equipment and systems.

.5 Instructors:
- .1 The consultant will provide the following:
  - .1 A description of the equipment and systems.
  - .2 The information and instructions regarding the philosophy and design criteria, as well as the intent of the designer.
- .2 The Contractor and the factory trained and certified personnel at the service of the manufacturer provide the training for the participants with respect to the following:
  - .1 Commissioning/start-up, functioning/operation, and shutdown/decommissioning of the components, the equipment, and the systems involved.
  - .2 Characteristics of the control devices, including the reasons and the results of these characteristics, the impact of the intervention of these devices on servo systems, the adjustment of controls and safety device set points.
  - .3 Instructions relating to maintenance, servicing and adjustment of components, equipment, and concerned systems.
- .3 The construction team must assume responsibility for the following:
  - .1 Implementation of training activities.

.2 Coordination of the work and the participation of different instructors.
.3 Quality of the training program and of the material used for that purpose.

.4 The commissioning authority will assess the quality of the training and the material used for that purpose.

.5 Once the training is completed, submit a written report signed by instructors and certified by each Contractor's person responsible of the commissioning.

.6 Training program contents:
.1 The training must include demonstrations on the installed equipment and systems by the instructors.
.2 The training should target, or include the following:
.1 Review of the building / installation profile and occupancy type.
.2 Functional requirements of the building.
.3 Design intent of the equipment and systems, all potential settings, and emergency procedures.
.4 Review of the arrangement of the different equipment, systems, and components and the control, regulation, and controls devices associated with each.
.5 Commissioning / start-up, operation, monitoring, maintenance, and shutdown / decommissioning procedures for the equipment and systems.
.6 Elements of preventative maintenance and repair.
.7 Troubleshooting diagnostics.
.8 Interaction between operating integrated systems.
.9 Review of operation and maintenance documents.
.3 Provide specialized training specified in the relevant technical sections of the specification.

PART 2 PRODUCTS

2.1 Not Used

.1 Not used

PART 3 EXECUTION

3.1 Not Used

.1 Not used

End of Section

PART 1 GENERAL

1.1 General

.1 Conform to the requirements of Division 1.

1.2 Related Sections

.1 Section 31 23 10 Excavating, Trenching and Backfilling

1.3 References

.1 The National Building Code of Canada, Part 8, Safety Measures on Construction and Demolition Sites.
.2 CSA Group (CSA)
  .1 CSA S350-M1980 (R2003), Code of Practice for Safety in Demolition of Structures
.3 Province of Ontario
  .1 Ontario Regulation 102/94, Waste Audits and Waste Reduction Work Plans.
  .2 Ontario Regulation 103/94.Environmental Protection Act.
  .3 Ontario Regulation 213/07 The Fire Code.
  .4 Ontario Regulation 232/98 Landfilling Sites.
  .5 Ontario Regulation 278/05 Designated Substance - Asbestos on Construction Projects and in Buildings and Repair Operations.
  .6 Ontario Regulation 347 Environmental Protection Act, General - Waste Management.
  .7 Ontario Regulation 521/03 The Gasoline Handling Act.
  .8 The Workplace Health and Safety Act, and Regulations for Construction Projects.
  .9 The Environmental Protection Act.
.4 The Contractors Health and Safety Policy.
.5 Laws, rules and regulations of other authorities having jurisdiction.

1.4 Submittals

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

.2 Submit detailed written methodology with proposed demolition procedures and including a “Safe Work Plan” to Consultant and Owner for review prior to commencement of demolition.

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

.4 Submit the following plans:
  .1 Phasing plan.
  .2 Fire safety plan.
  .3 Hoarding plans.
  .4 Waste management plan.

.5 Submit proposed dust-control measures.

.6 Submit proposed noise-control measures.

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

.8 Provide a phasing plan indicating areas of work and methods of protection. Indicate hoarding, fencing and public way protection locations and details. Schedule and sequence work in accordance with the phasing plans.

.9 Drawings for structural elements of the demolition process including shoring and underpinning shall bear signature and stamp of qualified professional engineer registered in the Province of Ontario.

.10 Submit proof that all personnel involved in the removal and handling of hazardous material are trained and certified in the safe removal and handling of such materials.

.11 Submit waste reduction progress reports. Include the following in the reports:
- .1 Material Category/Type
- .2 Where waste was generated
- .3 Total quantity of waste in tons.
- .4 Total quantity salvaged, in tons
- .5 Total quantity recycled, in tons
- .6 Total quantity recovered (salvaged + recycled), in tons
- .7 Total quantity recovered as a percentage of total waste.

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

1.5 Permits

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

.2 The Consultant will complete General Review during demolition in accordance with the Ontario Building Code, Division C., Part 1, Article 1.2.2.3. All other engineering required for shoring design and for other structural elements of the demolition work will be completed by the Contractor’s own engineer and paid for by the Contractor.

1.6 Engineering Design

.1 Engage the services of a qualified professional engineer registered in the Province of Ontario to review existing structure and prepare drawings for structural elements of the demolition process including shoring and underpinning.

1.7 Services

.1 Arrange and pay for all utility locates.

.2 Ensure that all services to areas of the building to be demolished are disconnected. Purge and drain all lines.

.3 Arrange for disconnection of public utilities with the respective utility company or municipal department.

.4 Make service disconnects as identified on drawings and as required.

.5 Coordinate work in the vicinity of overhead power lines with the local Power Authority and in accordance with Ministry of Labour requirements.

1.8 Work Included

.1 Complete removal and disposal of existing building and structures, including but not limited to building structure, walls, floors, framing, metal decking, roofs, roof grillages, mezzanines, masonry walls, concrete walls, partitions, portable structures, all finishes, fittings, doors, windows, screens, frames, floor slabs, trenches, pits, stairs, ladders and miscellaneous metal items.

.2 Complete abatement, removal and disposal of all designated hazardous materials as identified in hazardous materials report.

.3 Removal of all concrete slabs on grade, sumps, pits, trenches, bases and foundations to the elevation noted on the drawings.

.4 Complete removal of buried structures including, foundations and subsurface materials, pits, slab thickenings, trenches, paved areas, and mechanical and electrical services and systems within the future road allowance limits as indicated on the drawings.

.5 Decommissioning and removal of all mechanical systems (HVAC, plumbing, fire protection) including drainage and purging of all equipment and piping including all buried or underground services.

.6 Disconnection, removal and disposal of all electrical, data and communication services, systems, equipment and devices.

.7 Removal of landscape and site civil components, asphalt and concrete pavement, sidewalks, retaining walls, curbs, exterior structures, concrete barriers, exterior fixtures and equipment and other exterior elements.

.8 Removal and disposal of all process equipment, cranes, tanks, furniture fittings, window coverings, cabinets, shelving units, laboratory furnishings, debris and the like remaining in the building at the time of commencement of the Work.

1.9 Definitions

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

.2 Demolition Waste: Building materials and solid waste resulting from construction, remodeling, repair, cleanup, or demolition operations that are not hazardous. The materials may include rock, soil, tree stumps, and other vegetative matter resulting from land clearing.

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

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

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

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

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

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

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

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

1.10 Quality Assurance

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

.2 Abatement Contractors: Only abatement contractors licensed in the province of Ontario and approved by the Owner are permitted to undertake designated substances abatement and removal.

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

.4 Pre-demolition Conference: Conduct a conference at Project site.
.1 Review the environmental goals of this Project with Contractors, subcontractors, and waste haulers and make a proactive effort to increase awareness of these goals among all labor forces on site.
.2 Review schedule and scheduling procedures.
.3 Review health and safety procedures.
.4 Review of Designated Substances and Hazardous Materials Survey
.5 Review of Project conditions including review of record photographs.

1.11 Temporary Ventilation

.1 Provide all required temporary ventilation for demolition work.

1.12 Shoring and Bracing

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

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

1.13 Project Site Conditions

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

.2 Buildings and areas of buildings to be demolished including site work will be vacated and discontinued in use prior to the start of the work.

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

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

1.14 Waste Management and Disposal

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

PART 2 PRODUCTS

2.1 Materials

.1 All building materials removed from the building shall become the property of the Contractor unless specified otherwise and shall be removed from the Site.

.2 Conform to requirements of the General Conditions and Division 1, General Requirements, in particular, articles on Design and Safety Requirements for Temporary Work. Provide materials necessary for temporary shoring. On completion, remove temporary materials from site.

.3 Recycling:
.1 All materials from demolition and land clearing which can be recycled through local municipal programs and which are not scheduled for salvage shall be sorted and separated in accordance with Regional, Provincial and Municipal standards and regulations.
.2 Documentation must be kept of all recycled material in order to fill out waste reduction progress reports.
.3 Recycle paper and beverage containers used by onsite workers. Provide recycling receptacles for the duration of construction activities at the building site.
.4 Items of salvageable value to the Contractor may be removed from the structure as the work progresses.
.5 All concrete, masonry, asphalt and similar materials shall be crushed prior to removals from site.

2.2 Designated Substances

.1 Refer to Hazardous Building Materials Assessment, File # 200584.049, dated November 13, 2019 prepared by Pinchin.

.2 Provide and maintain all required temporary construction facilities and enclosures as required during removal of designated substances.

PART 3 EXECUTION

3.1 Phasing

.1 Schedule and sequence work in accordance with the phasing plans.

3.2 Examination

.1 The Demolition Plan indicates the general extent of existing conditions based upon drawings provided by the Owner and existing site conditions. Review all areas of work to determine full extent of areas to be demolished, altered or renovated and become familiar with actual conditions and extent of work required.

.2 Before commencing demolition operations, examine Site and when requested, provide engineering survey to determine type of construction, condition of structure, and site conditions. Assess strength and stability of damaged or deteriorated structures.

.3 Assess potential effect of removal of any part or parts on the remainder of structure before such part(s) are removed.

.4 Assess effects of demolition at adjacent building(s), structure(s) and consider need for underpinning, shoring and/or bracing.

.5 Investigate for following conditions:
.1 load bearing walls and floors
.2 structure suspended from another
.3 cantilevered construction
.4 effects of soils, water, lateral pressures on retaining or foundations walls
.5 presence of tanks, wells, other piping systems
.6 presence of hazardous materials

.6 Contact authorities or utility companies for assistance in locating and marking services passing under, through, over or adjacent to structure to be demolished. Such services include:
- .1 electrical power lines
- .2 gas mains
- .3 oil pipelines
- .4 communication cables
- .5 water mains and fire mains
- .6 drainage piping (storm and sanitary)
- .7 steam distribution
- .8 fibre optics

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

3.3 Protection

.1 Refer to designated substances reports including recommendations for the control of dust. Submit to the Owner and Consultant, work plans including plans for the control of airborne dust containing possible mold spores, and hazardous substances. Ensure that all necessary controls are in place at the beginning of each work period which will prevent the spread of contaminated material beyond the work area limits. Stop work immediately if there exists any possibility of the spread of contaminated materials.

.2 Provide, erect and maintain required temporary sidewalk sheds, catch platforms, lights and other protection around site before commencing work. Maintain such areas free of snow, ice, mud, water and debris.

.3 Maintain fences, barricades, lights, and other similar items around exposed excavations until such excavations have been completely filled.

.4 Provide flagmen where necessary or appropriate, to provide effective and safe access to Site to vehicular traffic.

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

.6 Provide enclosed dust chutes in accordance with CSA S350.with control gates from each floor to carry debris to truck beds and govern flow of material into truck. Provide overhead bridges of tight board or prefabricated metal construction at dust chutes to protect persons and property from falling debris.

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

.8 Keep hydrants clear and accessible at all times. Prohibit debris from accumulating within a radius of 4500 mm of fire hydrants.

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

.10 At all times protect the structure from overloading.

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

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

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

3.4 Environmental Controls

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

.2 Protection of Natural Resources:
- .1 Preserve the natural resources within the project boundaries or restore to an equivalent condition.
- .2 Confine demolition activities to areas defined by public roads, easements, and work area limits indicated on the drawings.
- .3 Temporary Construction: Remove indications of temporary construction facilities, such as haul roads, work areas, structures, stockpiles or waste areas.
- .4 Water Resources: Comply with applicable regulations concerning the direct or indirect discharge of pollutants to underground and natural surface waters. Provide sedimentation control where necessary.
- .5 Oily Substances: Prevent oily or other hazardous substances from entering the ground, drainage areas, or local bodies of water in such quantities as to affect normal use, aesthetics, or produce a measurable ecological impact on the area.
- .6 Store and service construction equipment at areas designated for collection of oil wastes.

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

.4 Noise Control: Perform demolition operations to minimize noise.
- .1 Repetitive, high level impact noise will be permitted only between the hours of 8:00 a.m. and 6:00 p. m. Repetitive impact noise on the property shall not exceed the following dB limitations:

Sound Level in dB	Time Duration of Impact Noise
60 db	More than 12 minutes in any hour
70 dB	More than 3 minutes in any hour

- .2 Provide equipment, sound deadening devices, and take noise abatement measures that are necessary to comply with the requirements of this Contract and with municipal regulations.
- .3 Coordinate vibration creating operations with Owner such that nearby functioning facilities are disturbed minimally.

.5 Salvage, Re-Use, and Recycling Procedures:
.1 Identify re-use, salvage, and recycling facilities.
.2 Develop and implement procedures to re-use, salvage, and recycle demolition materials, based on the Contract Documents, the Contractor's Waste Management and Recycling Plan, estimated quantities of available materials, and availability of recycling facilities. Procedures may include on-site recycling, source-separated recycling, salvage, and/or mixed debris recycling efforts.
.3 Identify materials that are feasible for salvage, determine requirements for site storage, and transportation of materials to a salvage facility.
.4 Source-separate clean and uncontaminated demolition materials including, but not limited to the following types:
.1 Asphalt
.2 Concrete, Concrete Block, Concrete Masonry Units (CMU)
.3 Brick.
.4 Cement Fiber Products.
.5 Rigid Foam
.6 Glass
.7 Plastics
.8 Carpet and Carpet Padding
.9 Insulation
.10 Gypsum Board
.11 Porcelain Plumbing Fixtures
.12 Fluorescent Light Tubes
.13 Metal (ferrous and non-ferrous)
.14 Soil
.15 Wood, Clean Dimensional Wood, Pallet Wood
.16 Sheet Wood: Plywood, Oriented Strand Board (OSB), Particle Board
.17 Beverage Containers
.18 Paper: Bond, Newsprint, Cardboard, Paper, Packaging Materials
.19 Other materials as appropriate.
.5 Develop and implement a program to transport loads of mixed demolition materials that cannot be feasibly source separated to a mixed materials recycling facility.

3.5 Performance

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

.2 Demolition shall proceed safely in systematic manner from roof to grade, as specified herein, and as necessary to accommodate remedial work indicated. Work on each floor level shall be complete before commencing work on supporting structure and safety of its supports are impaired. Parts of building which would otherwise collapse prematurely shall be securely shored. Walls and piers shall not be undermined.

.3 At end of each day's work, leave work in safe condition ensuring that no parts of structure are in danger of collapsing.

.4 Maintain and preserve active utilities traversing premises.

.5 Keep work wetted down to minimize dust.

.6 Upon completion of demolition work, level and clear site or prevent access to excavations by means of fences or hoardings.

.7 Maintain safety of Site by shoring against collapse below-grade-structures and excavations resulting from demolition. Where required, provide structural supports for adjacent structures.

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

3.6 Demolition and Removals

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

.2 Maintain the work areas and storage areas clean and orderly at all times and free of rubbish and debris.

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

.4 Particular attention shall be paid to prevention of fire and elimination of fire hazards.

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

.6 Demolish building completely and remove from site.

.7 Execute all cutting and removal of existing building walls, floor slabs, structural steel, roof deck, roofing and other removals as required.

.8 Maintain the existing neighboring buildings or fencing. All damage caused to the building interior and/or equipment, etc. of the existing buildings by the neglect of the Contractor or any of his forces shall be made good at the expense of the Contractor including all costs and charges which may be claimed by the Owner for damages or loss of production suffered.

.9 The following methods of demolition will not be permitted:
  .1 Use of explosives.
  .2 Mechanical method of demolition whereby wrecking is accomplished by smashing the walls or floors with a heavy weight suspended by a cable from a boom or hoist or where masonry walls are collapsed using a power shovel, tractor or other mechanical means.

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

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

.12 Demolish masonry and concrete walls in small sections. Carefully remove and lower structural framing and other heavy or large objects.

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

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

.15 Prevent movement, settlement or damage of adjacent structures, services, adjacent grades. Make good damage caused by demolition work.

.16 Use methods required to complete the work within limitations of governing regulations.

.17 Locate demolition equipment throughout the building and remove debris and materials so as not to impose excessive loads on supporting walls, floors, or framing.

.18 Demolish concrete and masonry in sizes that will be suitable for acceptance at recycling or disposal facilities.

.19 Remove structural framing and lower to ground by method suitable to avoid free fall and to prevent ground impact or dust generation.

.20 Break up and remove concrete slabs on grade in small sections suitable for acceptance at recycling or disposal facilities.

.21 Remove all disconnected or abandoned utilities.

.22 Demolish foundation walls and other below grade construction as follows:
- .1 Completely remove below grade construction.
- .2 Remove all underground sub-drainage systems and weeping tiles.
- .3 Break up and remove completely, below grade concrete slabs, foundation walls, footings, piers, equipment bases, pits and trenches.
- .4 Remove all buried utilities.
- .5 Remove entirely, all catch basins and manholes.
- .6 Remove concrete duct banks.
- .7 Backfill and compact all excavations.

.23 Damages: Promptly repair damages to adjacent facilities caused by demolition operations

3.7 Hazardous Materials

.1 Safely remove and dispose of identified substances in accordance with all applicable legislation. Utilize licensed and qualified personnel and sub-trades to execute this work.

.2 Provide backup documentation as necessary to verify disposal sites for any designated substances removed from the site.

3.8 Handling of Demolished Materials

.1 Conform to the approved Waste Management Plan.

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

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

.4 Disposal: Transport demolished materials off Owner’s property and legally reuse, salvage, recycle, or dispose of materials.

.5 Legally transport and dispose of materials that cannot be delivered to a source separated or mixed recycling facility to a transfer station or disposal facility that can legally accept the materials for the purpose of disposal.

.6 Become familiar with the conditions for acceptance of new construction, excavation and demolition materials at recycling facilities prior to delivering materials.

.7 Use a permitted waste hauler or Contractor's trucking services and personnel.

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

.9 Remove and transport materials from demolition in a manner that will prevent spillage on adjacent surfaces, streets, and areas or dust being emitted into the atmosphere.

.10 Implement a re-use program to the greatest extent feasible.

3.9 Cleaning

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

.2 Upon completion of demolition work, level and clear site or prevent access to excavations by means of fences or hoardings.

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

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

.5 Remove equipment and debris and leave work site clean.

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

End of Section

PART 1 GENERAL

1.1 General

.1 Conform to the requirements of Division 1.

1.2 Related Sections

.1 Section 03 20 00 Concrete Reinforcing
.2 Section 03 30 00 Cast-in-Place Concrete
.3 Section 05 50 00 Metal Fabrications
.4 Section 31 23 10 Excavating, Trenching and Backfilling

1.3 References

.1 American Concrete Institute (ACI)
  .1 ACI 117-10 Specifications for Tolerances for Concrete Construction and Materials.
  .2 ACI 347R-14 Guide to Formwork for Concrete
  .3 ACI SP-4-14 Formwork for Concrete
.2 CSA Group (CSA)
  .1 CSA A23.1:19/A23.2:19 Concrete Materials and Methods of Concrete Construction/ Methods of Test Methods and Standard Practice for Concrete
  .2 CSA B111-1974 (R2003) Wire Nails, Spikes and Staples
  .3 CSA O86-14 Engineering Design in Wood
  .4 CSA O121-2017 Douglas Fir Plywood
  .5 CSA O141-05 (R2019) Softwood Lumber
  .6 CSA S269.1-16 Falsework and Formwork
.3 Ontario Provincial Standard Specifications (OPSS)
  .1 OPSS 1204 Material Specification for Polyvinyl Chloride Waterstops

1.4 Submittals

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

.2 Shop Drawings:
  .1 Submit shop drawings showing type, extent and locations of items to be built into concrete.
  .2 Sleeving Drawings: Submit drawings showing sleeves required through floors, roof and other structural members.
  .3 Submit drawings showing size and spacing of conduits and piping.
  .4 Coordinate with other Divisions prior to submittal.
  .5 Prior to submission to Consultant, review all submitted drawings. By this review, Contractor represents to have determined and verified field measurements, site conditions, materials, catalogue number and similar data and to have checked and coordinated each drawing with the requirements of Work and of Contract Documents. Contractor's review of each drawing shall be indicated by stamp, date and signature of a responsible person.
  .6 At time of submission, notify Consultant in writing of any deviations in drawings from the requirements of the Contract Documents.
  .7 Consultant will review and return submitted drawings in accordance with an agreed schedule. Consultant's review will be for conformity to design concept and for general arrangement and shall not relieve Contractor of responsibility for errors or omissions in submitted drawings or of responsibility for meeting requirements of Contract Documents.

.8 Make any changes in submitted drawings which Consultant may require, consistent with Contract Documents and resubmit unless otherwise directed by Consultant. When resubmitting, notify Consultant in writing of any revisions other than those requested by Consultant.
.9 Do not commence placing sleeves, conduits, or piping before drawings have been reviewed and Consultant's comments incorporated on drawings issued to site.
.10 Assume responsibility for accuracy of Work. Review of submitted shop drawings does not relieve Contractor from compliance with requirements of Contract Documents.

.3 Required by Regulatory Agencies: Submit shop drawings bearing signature and seal of Professional Engineer responsible for formwork design, as may be required by regulatory Agencies. Proceed with construction of formwork only with their approval.

1.5 Quality Assurance

.1 Obtain a copy of CSA A23.1/A23.2 and maintain on site

.2 Design of Formwork: Assume full responsibility for complete structural design and construction of formwork in accordance with CSA S269.1 and CSA O86, as applicable.
.1 The design and engineering of the formwork, as well as its' construction, shall be the responsibility of the Contractor.

.3 Formwork shall be designed for the loads and lateral pressures outlined in the ACI publication "SP-4 Formwork for Concrete" and wind pressures and allowable stresses as set down in the National Building Code and in accordance with CSA A23.1 and A23.2. Formwork shall be of sufficient strength and rigidity to support all concrete and construction loads, taking into account proposed rate and method of pouring concrete so that the resultant finished concrete shall conform to the shapes, lines and dimensions of the members shown on the drawings.

1.6 Shipping, Handling and Storage

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

.2 Protect formwork to prevent functional damage and damage to faces affecting appearance of concrete surfaces exposed to view.

1.7 Waste Management and Disposal

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

PART 2 PRODUCTS

2.1 Materials

.1 All materials shall be new, in accordance with referenced standards.

.2 Plywood: Douglas Fir, conforming to CSA O121. Sound undamaged sheets finished one side, fabricated especially for use as concrete form panels, with sealed edges. Minimum 17mm thickness.

.3 Lumber: Conforming to CSA O141, with grade stamp clearly visible.

.4 Chamfers: Cut from 19mm x 19mm wood, smooth with no open defects.

.5 Form Ties: snap ties, with spreader washer and 25mm break back.

.6 Joint Tape: non-staining, water impermeable, self-release.

.7 Nails, Spikes and Staples: Galvanized, conforming to CSA B111.

.8 Form Release Agent: Colourless mineral oil which will not stain concrete.

.9 For concrete surfaces exposed to view, provide panels smooth and free of defects which would be reproduced as concrete blemishes.

PART 3 EXECUTION

3.1 Examination

.1 Before starting this work, examine work done by others which affects this work.

.2 Notify the Consultant of any conditions which would prevent proper completion of this work.

.3 Commencement of work implies acceptance of existing conditions.

3.2 Erection

.1 Verify lines, levels and centres before proceeding with formwork. Ensure dimensions agree with drawings.

.2 Align joints and make watertight, to prevent leakage of cement paste and disfiguration of concrete.

.3 Construct formwork to produce concrete with dimensions, lines and levels within tolerances specified in ACI 347R-14.

.4 Provide formed openings where required for pipes, conduits, sleeves and other work to be embedded in and passing through concrete members.

.5 Install chamfers at all external corners exposed to view.

.6 Adequately brace and shore formwork to sustain loads (both concrete and working loads) applied during construction.

.7 Be responsible for safety of the structure both before and after the removal of forms, until the concrete has reached its specified 28 day strength.

3.3 Built-In Work

.1 Form openings and build in anchors, inserts, sub-frames, key-ways, sleeves, miscellaneous metal items, reglets and similar items furnished under Work of other Sections, which are indicated on Drawings and on shop drawings of other trades, and as required for proper completion of Work.

.2 Do not embed wood in concrete.

.3 Anchor Bolts: Tie anchor bolts securely in position to prevent movement during concrete placing. Use template to locate bolts. Verify that bolts have specified projection above concrete.

.4 Openings or Sleeves Not Shown on Structural Drawings:
.1 Obtain Consultant's written approval before forming openings of sleeves through columns and beams, or through slabs within 1800 mm of their supports.

.2 Obtain Consultant's written approval before forming openings or sleeves larger than 200 mm square in any location.

.5 Embedded Pipe or Conduit Not Shown or Detailed on Structural Drawings:
.1 Obtain Consultant's written approval before placing conduit or pipe which would be embedded in finished structure.

.6 Confirm that built-in items that penetrate surface waterproofing are installed to meet requirements of waterproofing trade.

3.4 Construction Joints

.1 Form construction and expansion joints with bulkheads to ensure straight lines. Immediately before subsequent pour at construction joint, remove bulkhead and tighten forms so that concrete surfaces will be on same plane with no overlapping of concrete.

.2 Review with Consultant proposed location and details of construction joints in walls, columns, beams and slabs.
.1 Construction joints shall present appearance of normal form panel joint.
.2 Install continuous shear key in construction joints in walls and framed floors which are 152mm or more thick.
.3 Provide vertical construction joints in walls at not more than 20 metres centre to centre.
.4 Provide waterstops in accordance with manufacturer’s instructions at construction joints in walls which retain earth. Waterstops shall be continuous.

3.5 Treatment of Formwork Surfaces

.1 Form Release Agent:
.1 Coat formwork with form release agent before reinforcement, anchors, accessories, and other built in items are installed.
.2 Do not coat plywood forms pre-treated with release agent.

.3 On surfaces to receive finish materials, adhesives, sealers, paint or other coatings or materials, use a compatible release agent.

3.6 Stripping of Formwork

.1 Strip formwork on vertical surfaces when concrete has hardened sufficiently that no damage will result from stripping operations.

.2 Do not remove plywood formwork by jerking loose or by metal pinch bars. Use wood wedges and gradually force panels loose. Leave plywood forms in place as long as possible to permit maximum shrinkage away from concrete.

.3 Take particular care not to damage external corners when stripping formwork.

.4 When forms are stripped during curing period, cure and protect exposed concrete in accordance with Section 03 30 00 - Cast-in-Place Concrete.

3.7 Defective Work

.1 Movement and displacement of formwork during construction, variations in excess of specified tolerances, marked and disfigured surfaces, and failure of materials or workmanship to meet requirements of this specification, and which cannot be repaired by approved methods, will be considered defective work.

.2 Replace defective work, as directed by Consultant.

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

.4 Reconstruct defective formwork and replace concrete and reinforcement placed in defective formwork at no additional cost.

3.8 Cleaning

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

End of Section

PART 1 GENERAL

1.1 General

.1 Conform to the requirements of Division 1.

1.2 Related Sections

.1 Section 03 10 00 Concrete Forming and Accessories
.2 Section 03 30 00 Cast-in-Place Concrete
.3 Section 04 05 19 Masonry Anchorage and Reinforcing
.4 Section 04 22 00 Concrete Unit Masonry
.5 Section 05 50 00 Metal Fabrications

1.3 References

.1 ASTM International (ASTM)
  .1 ASTM A143/A143M-07(2020) Standard Practice for Safeguarding Against Embrittlement of Hot-Dip Galvanized Structural Steel Products and Procedure for Detecting Embrittlement
  .2 ASTM A1064/A1064M-18a Standard Specification for Carbon-Steel Wire and Welded Wire Reinforcement, Plain and Deformed, for Concrete
.2 American Concrete Institute (ACI)
  .1 ACI SP-66 (04) ACI Detailing Manual
.3 CSA Group (CSA)
  .1 CSA A23.1:19/A23.2:19 Concrete Materials and Methods of Concrete Construction/ Methods of Test Methods and Standard Practice for Concrete
  .2 CSA A23.3-14 Design of Concrete Structures
  .3 CSA G30.18-09 (R2014) Carbon Steel Bars for Concrete Reinforcement
  .4 CSA G40.20-13/G40.21-13 General Requirements for Rolled or Welded Structural Quality Steel/Structural Quality Steel
  .5 CSA W186-M1990 (R2012) Welding of Reinforcing Bars in Reinforced Concrete Construction
.4 Reinforcing Steel Institute of Canada (RSIC)
  .1 RSIC Reinforcing Steel Manual of Standard Practice

1.4 Submittals

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

.2 Shop Drawings:
  .1 Submit shop drawings, including placing drawings and bar lists.
  .2 Prepare placing drawings and bar lists in accordance with the American Concrete Institute (ACI) Detailing Manual, and the Reinforcing Steel Institute of Canada (RSIC) Reinforcing Steel Manual of Standard Practice and the typical details included with Contract Documents.
  .3 Prepare placing drawings to minimum scale of 1:50.
  .4 Submit placing drawings and bar lists sufficiently detailed and dimensioned to permit correct placement of reinforcement and accessories without reference to architectural or structural Drawings.
  .5 Show reinforcement, including dowels, in elevation on placing drawings for wall reinforcement.
  .6 Show concrete cover to reinforcement.
  .7 Show location of construction joints.

.3 Inspection Reports: Inspection and Testing Company shall:
  .1 Submit written reports of inspection and tests.

.2 Distribute reports as follows:
.1 Consultant.
.2 Contractor.

.4 Quality Assurance Submittals:
.1 Mill Test Report: provide Consultant with certified copy of mill test report of reinforcing steel, showing physical and chemical analysis, minimum 4 weeks prior to beginning reinforcing work.
.2 Submit in writing proposed source of reinforcement material to be supplied.

1.5 Quality Assurance

.1 Obtain a copy of CSA A23.1/A23.2 and maintain on site.

.2 Qualifications: Welding: Undertake welding of reinforcement only by a fabricator or Subcontractor approved by Canadian Welding Bureau to requirements of CSA W186.

.3 Source Quality Control: Source Quality Control may be performed by an Inspection and Testing Company appointed by Consultant.

.4 Review provided by Inspection and Testing Company does not relieve Contractor of his sole responsibility for quality control over Work. Performance or non-performance of Inspection and Testing Company shall not limit, reduce, or relieve Contractor of his responsibilities in complying with the requirements of the Specification.

.5 Identify and correlate reinforcing steel from Canadian mills with test reports for compliance with requirements specified.

.6 Test unidentified reinforcing steel at expense of Contractor. Perform testing for each 1 tonne or part thereof supplied for incorporation in Work.

1.6 Shipping, Handling and Storage

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

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

1.7 Waste Management and Disposal

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

PART 2 PRODUCTS

2.1 Materials

.1 In accordance with reference standards.

.2 Substitute different size bars only if permitted in writing by Consultant.

.3 Bar Reinforcing Steel:
.1 Bars which are to be welded by arc-welding process: to CSA G30.18, Grade 400W.
.2 Other bars: to CSA G30.18, Grade 400R.

.4 Plain round bars: to CSA G40.20-04/G40.21.

.5 Welded Wire Fabric: to ASTM A1064/A1064M and in flat sheets, not rolls.

.6 Cold-drawn annealed steel wire ties: to ASTM A497.

.7 Chairs, bolsters, bar supports, spacers: to CSA A23.1.

.8 Mechanical splices: subject to approval of Consultant.

2.2 Fabrication

.1 Fabricate reinforcing steel only in permanent fabricating shop.

.2 Fabricate reinforcing steel in accordance with shop drawings.

.3 Tag reinforcing bars to indicate placement as designated on shop drawings.

.4 Splices:
- .1 Provide splices only where specifically indicated on Drawings.
- .2 Stagger alternate mechanical splices 750 mm apart.
- .3 Stagger alternate end bearing splices 750 mm apart.
- .4 Install on threaded splices, plastic internal coupler thread protector and plastic bar end thread protector.

PART 3 EXECUTION

3.1 Examination

.1 Before starting this work, examine work done by others which affects this work.

.2 Examine formwork to verify that it has been completed, and adequately braced in place.

.3 Notify the Consultant of any conditions which would prejudice proper completion of this work.

.4 Commencement of work implies acceptance of existing conditions.

3.2 Installation

.1 Place reinforcing steel in accordance with reviewed placing drawings, typical details, and CSA A23.3.

.2 Adequately support reinforcing and secure against displacement within tolerances permitted.

.3 Place reinforcing steel to provide minimum spacing and proper concrete cover as noted on drawings.

.4 Do not cut reinforcement to incorporate other Work.

.5 Relocate or rebend bars only on written instructions of Consultant.

.6 Tie reinforcement in place. Do not weld.

3.3 Adjusting

.1 Adjust and secure reinforcement in correct position immediately before concrete is placed.

.2 Remove contaminants which lessen bond between concrete and reinforcement.

3.4 Field Quality Control

.1 Provide competent supervisor, with at least three years of experience in reinforcement placement, to direct placement of reinforcement.

.2 Inspect placement of reinforcement for conformance with Drawings and Specifications, before each concrete placement, and correct as necessary.

.3 Consultant's periodic review of selected areas of reinforcement are for verification of conformity to design concept and general arrangement only and shall not relieve Contractor of responsibility for quality control, errors, or omissions, or conformance with requirements of Contract Documents.

3.5 Defective Work

.1 Incorrectly fabricated, misplaced or omitted reinforcement will be considered defective Work.

.2 Replace or adjust defective reinforcement before concrete is placed as directed by Consultant.

.3 Replace or strengthen concrete work which is deficient as a result of incorrectly fabricated, misplaced, or omitted reinforcement, which was not corrected before concrete was placed.

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

3.6 Cleaning

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

End of Section

)PART 1 GENERAL

1.1 General

.1 Conform to the requirements of Division 1.

1.2 Related Sections

.1 Section 03 10 00 Concrete Forming and Accessories
.2 Section 03 20 00 Concrete Reinforcing
.3 Section 04 05 19 Masonry Anchorage and Reinforcing
.4 Section 04 22 00 Concrete Unit Masonry
.5 Section 05 31 00 Steel Deck
.6 Section 05 50 00 Metal Fabrications
.7 Section 07 92 00 Joint Sealants

1.3 References

.1 ASTM International (ASTM)
  .1 ASTM C260/C260M-10a (2016) Standard Specification for Air Entraining Admixtures for Concrete
  .2 ASTM C295/C295M-19 Standard Guide for Petrographic Examination of Aggregates for Concrete
  .3 ASTM C309-19 Standard Specification for Liquid Membrane Forming Compounds for Curing Concrete
  .4 ASTM C330/C330M-17a Standard Specification for Lightweight Aggregates for Structural Concrete
  .5 ASTM C494/C494M-19 Standard Specification for Chemical Admixtures for Concrete
  .6 ASTM C881/C881M-20a Standard Specification for Epoxy-Resin-Base Bonding Systems for Concrete
  .7 ASTM C1017/C1017M-13e1 Standard Specification for Chemical Admixtures for Use in Producing Flowing Concrete.
  .8 ASTM C1107/C1107M-20 Standard Specification for Packaged Dry, Hydraulic-Cement Grout (Nonshrink)
  .9 ASTM D412-16 Standard Test Methods for Vulcanized Rubber and Thermoplastic Elastomers—Tension
  .10 ASTM D570-98(2018) Standard Test Method for Water Absorption of Plastics
  .11 ASTM D624-00(2020) Standard Test Method for Tear Strength of Conventional Vulcanized Rubber and Thermoplastic Elastomers.
  .12 ASTM D638-14 Standard Test Method for Tensile Properties of Plastics
  .13 ASTM D1259-06(2018) Standard Test Methods for Nonvolatile Content of Resin Solutions
  .14 ASTM D1751-18 Standard Specification for Preformed Expansion Joint Filler for Concrete Paving and Structural Construction (Nonextruding and Resilient Bituminous Types)
  .15 ASTM D2240-15e1 Standard Test Method for Rubber Property—Durometer Hardness
  .16 ASTM D5329-20 Standard Test Methods for Sealants and Fillers, Hot-Applied, for Joints and Cracks in Asphalt Pavements and Portland Cement Concrete Pavements
.2 American Concrete Institute (ACI)
  .1 ACI 117-10 Specifications for Tolerances for Concrete Construction and Materials.
  .2 ACI 232.1R-12 Report on the Use of Raw or Processed Natural Pozzolans in Concrete
.3 CSA Group (CSA)
  .1 CSA A23.1:19/A23.2:19 Concrete Materials and Methods of Concrete Construction/ Methods of Test Methods and Standard Practice for Concrete.
  .2 CSA A283:19 Qualification Code for Concrete Testing Laboratories.

.3 CSA A3000-18 Cementitious Materials Compendium

.4 Ontario Provincial Standard Specifications (OPSS)

.1 OPSS 1010 Material Specification for Aggregates - Granular A, B, M and Select Subgrade Material.

.2 OPSS 1212 Material Specification for Hot-Poured Rubberized Asphalt Joint Sealing Compound.

1.4 Submittals

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

.2 Samples: Submit for inspection, material samples of specified mix designs.

.3 Concrete Mix Designs:

.1 Submit concrete mix designs for review. Specify intended use for each mix design.

.2 Review of mix design does not relieve Contractor from responsibility for compliance with Contract Documents.

.3 Provide certification that mix proportions selected will produce concrete of specified quality and yield and that strength will comply with CSA A23.1. Mix design shall be adjusted to prevent alkali aggregate reactivity problems.

.4 Provide certification that plant, equipment, and all materials to be used in concrete comply with the requirements of CSA A23.1.

.5 Submit written requests for use of admixtures not specified, for site mixing of concrete, and for use of bonding agents.

.6 Submit in writing, proposed method of in-situ strength testing.

.4 Inspection Reports: Inspection and Testing Company shall:

.1 Submit written reports of inspection and tests.

.2 Distribute reports as follows:

.1 Consultant;

.2 Contractor.

.3 On concrete cylinder test reports, include:

.1 Specific location of concrete represented by sample

.2 Design strength.

.3 Unit weight of sample

.4 Class of exposure

.5 Aggregate size and mixtures incorporated

.6 Date, hour and temperature at time sample taken

.7 Percentage air content

.8 Test strength of cylinder

.9 Type of failure if test fails to meet specification.

1.5 Quality Assurance

.1 Obtain a copy of CSA A23.1/A23.2 and maintain on site.

.2 Pre-Construction Conference:

.1 At least 35 days prior to the start of concrete construction schedule, conduct a meeting to review proposed mix designs and to discuss detailed requirements of the proposed concrete operations. Review requirements for submittals, coordination, and availability of materials. Establish work progress and sequencing schedules and procedures for material testing, inspection and certifications.

.3 Source Quality Control:
- .1 Both source quality control, and field quality control specified in Article 1.5.4, may be performed by an Inspection and Testing Company appointed by Consultant.
- .2 Review provided by Inspection and Testing Company does not relieve the Contractor of his sole responsibility for quality control over Work. Performance or non- performance of Inspection and Testing Company shall not limit, reduce, or relieve Contractor of his responsibilities in complying with the requirements of the Specification.
- .3 Inspection and Testing Company shall be certified under CSA A283, Qualification Code for Concrete Testing Laboratories, for Category 1 Certification.
- .4 Payment for specified Work performed by Inspection and Testing Company will be made from Cash Allowance.
- .5 Payment for additional tests (including testing of structure and its performance and load testing) required by changes of materials or mix design requested by Contractor, and failure of completed Work to meet specified requirements, shall be made at Contractor's expense.
- .6 Perform Work of source quality control in accordance with CSA A23.2 and to include:
  - .1 Verification that ready-mix supplier is qualified to supply concrete in accordance with Specification.
  - .2 Review of proposed concrete mix designs.
  - .3 Sampling, inspection, and testing of materials as may be required.

.4 Field Quality Control:
- .1 Inspection and Testing Company, when appointed as specified for Source Quality Control, shall perform sampling, inspection and testing of concrete work at site.
- .2 Perform sampling, inspection and testing in accordance with CSA A23.2, and to include:
  - .1 Making of standard slump tests.
  - .2 Obtaining of three standard specimens for strength tests from each 100 m of concrete, or fraction thereof, of each mix design of concrete placed in any one day. In addition, for slabs-on-grade, obtain beam specimens for determination of modulus of rupture.
  - .3 Verification that test specimens are stored within an enclosure, maintained at specified temperatures.
  - .4 Making compression tests of each set of three specimens, one at 7 days and two at 28 days; modulus of rupture tests at 90 days.
  - .5 Verification of air content of air-entrained concrete.
    - .1 For Class of exposure F-1, and C-2, test at frequency in accordance with CSA A23.1.
    - .2 Make first test before placing any concrete.
    - .3 After stable air content has been established, frequency of tests will be determined by Consultant.
    - .4 For other Classes of exposure, test at time of obtaining strength test specimens.
- .3 Inspection for Tolerances:
  - .1 Confirm that concrete work meets specified tolerance requirements.
  - .2 Use the elevation survey records of elevations of finished concrete surfaces specified in Section 03 10 00 and this section as basis for judging compliance.
  - .3 Use approved aluminum straightedge to judge compliance with specified slab tolerances, except use dipstick equipment where F-number tolerance is specified.

- .4 Slabs-on-Grade:
  - .1 Observe application of curing compound to sample slab, recording rate of application.
  - .2 Monitor on a random basis acceptable to the Consultant, that slab is being saw cut before slab temperature starts to fall.
  - .3 Qualifications: Floor finishing shall be undertaken only by contractors with at least 10 years of experience.
  - .4 Sample of Finish Flooring:

.1 Finish an area of floor slab where directed by Consultant to provide sample of finish for approval.
.2 Protect new sample area until finish is approved.
.3 If liquid membrane curing compound is to be used on Project, determine and apply correct quantity required to meet rate of coverage recommended by manufacturer for measured test area.
.4 Approved sample will provide standard by which subsequent finishing will be judged and will be incorporated into Work.

1.6 Tolerances

.1 In accordance with ACI 117 and CSA A23.1.

.2 Difference between elevation of high point and low point in specified area not to exceed:
.1 In any bay up to 100 m^2: 12 mm.
.2 In any bay up to 400 m^2: 25 mm.

.3 Straightedge method: Finish floor slabs to meet following tolerances when measured at 72 +/- 12 hours after completion of floor finishing, before shores are removed from formed slabs, by placing a freestanding unleveled straight edge anywhere on slab and allowing it to rest on two high points. Gap between straightedge placed on two high points and slab not to exceed:
.1 3 metre straightedge: 8 mm (Class A).
.2 2 metre straightedge: 4 mm.

1.7 Shipping, Handling and Storage

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

1.8 Job Conditions

.1 Protect floor slabs, and concrete surfaces exposed to view or on which finishes are to be applied, from grease, oil, and other soil which will affect the appearance of the concrete, or impair the bond of finish material.

.2 Environmental Conditions: In addition to Cold Weather and Hot Weather Requirements of CSA A23.1, the following shall apply to Work of this Section:
.1 Provide protection or heat, or both, so that 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.
.2 Do not permit alternate freezing and thawing for fourteen days after placing.
.3 Vent exhaust gases from combustion type heaters to atmosphere outside protection enclosures.
.4 Provide protection to maintain concrete continuously moist during curing period.
.5 For field cured cylinders representing strength development of in-situ concrete, provide same specified hot and cold weather protection for storage of each concrete compression specimen as for concrete from which it was taken, until it is sent to testing laboratory.
.6 Do not place concrete during rain. Should rain commence during placing, cover freshly placed concrete.
.7 Do not place bonded toppings on rough slabs that are less than 15 °C.
.8 Do not grout at ambient air temperatures or concrete surface temperatures less than 5 ° C, or when temperature is forecast to fall to less than 5 ° C within 24 hours of grouting.

.9 Do not apply sealants at ambient air temperatures or concrete surface temperatures less than 5 ° C.

1.9 Project Records

.1 Maintain record of all concrete pour related to time, date, delivery slip serial number and location of each concrete pour and identify related test cylinders. Keep records on site until project is completed.

.2 Delivery Records: File duplicate copies of concrete delivery slips on which shall be recorded: supplier, serial number of slip, date, truck number, contractor, Project, Class of exposure, cementing materials content, air content, volume in load, and time of first mixing of aggregate, cementing materials and water.

.3 Record Drawings:
.1 Record on a set of Drawings:
.1 founding elevations of all footings
.2 variations of foundation Work from that indicated on Drawings.
.2 Make record drawings available for Consultant's inspection at all times.

1.10 Waste Management and Disposal

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

PART 2 PRODUCTS

2.1 Materials

.1 To meet specified requirements of referenced Standards.

.2 Cement:
.1 Portland Cement: to CSA A3000.
.2 Cementitious Hydraulic Slag: to ACI 232.1R

.3 Fine Aggregate: For slabs-on-grade, fineness modulus of fine aggregate to be between 2.7 and 3.1.

.4 Coarse Aggregates:
.1 20 mm to 5 mm (No. 4 sieve) except as specified below.
.2 For slabs-on-grade 125 mm and thicker: 40 mm to 5 mm (No. 4 sieve); combine at least two of the single sizes specified in Table 5 Group II of CSA A23.1, one of which is to be 40 mm, to obtain maximum bulk density (unit weight) and optimum grading, in accordance with an approved procedure.
.3 For slabs-on-grade: Abrasion loss not to exceed 35%. Petrographic number of aggregate not to exceed 125 when tested in accordance with ASTM C295.
.4 For toppings 50 mm thick and less and for slabs over open web steel joists: 12 mm to 5 mm (No. 4 sieve).

.5 Admixtures:
.1 Conform to Reference Standards for chemical and air-entraining admixtures.
.2 Provide only admixtures that are free of chlorides.

.3 When requested, provide evidence acceptable to Consultant that superplasticizer does no increase shrinkage of concrete.

.6 Curing-Sealing Compound: Membrane curing-sealing compound formulated from chlorinated rubber resins, or acrylic emulsion, solvent free for use in occupied buildings, to ASTM C309, type 1.
.1 Basis-of-Design Product: Euclid Chemical Company; Diamond Clear 350 or a comparable product by one of the following:
.1 BASF Corporation - Construction Systems.
.2 Sika Corporation
.3 W.R. Meadows

.7 Bonding Agent: To ASTM C881, 100% reactive, 2 component, low viscosity, high modulus bonding adhesive.

.8 Non-Metallic Hardener: Natural and synthetic materials with Mohs hardness 7 minimum, premixed with Portland cement.
.1 Basis-of-Design Product: Subject to compliance with requirements, provide Euclid Chemical Company; Surflex. or a comparable product by one of the following:
.1 BASF Corporation - Construction Systems.
.2 Sika Corporation

.9 Non-Oxidizing Metallic Dry-Shake Floor Hardener: Unpigmented, factory-packaged, dry combination of Portland cement, graded metallic aggregate, rust inhibitors, and plasticizing admixture; with metallic aggregate consisting of no less than 65 percent of total aggregate content.
.1 Basis-of-Design Product: Subject to compliance with requirements, provide Euclid Chemical Company; EUCO-PLATE H.D. or a comparable product by one of the following:
.1 BASF Corporation - Construction Systems.
.2 Sika Corporation

.10 Saw Cut Filler: Semi-rigid epoxy or polyurea in accordance with ACI 302.1R for joint fillers used in control and construction joints.
.1 Basis of Design Euco 700 or Euco QWIKjoint UVR by Euclid Chemical.

.11 Premoulded Joint Fillers: Bituminous impregnated fiber board: to ASTM D1751.

.12 Sealant: Refer to Section 07 92 00 – Joint Sealants

.13 Mechanical Anchors: 'Kwik' Bolts, 'Cinch' Anchors or Parabolts.

.14 Weep hole tubes: plastic.

2.2 Concrete Mixes

.1 Ready Mix, with 28 day compressive strength as indicated on Drawings.

.2 Design concrete mix in conformance with CSA A23.1, Tables 1, 2, 5 (Alternative 1) and 17, and as follows. Provide concrete meeting water/cementing materials ratio and air content of Table 14 in accordance with Class of exposure specified in following sub-paragraphs, and minimum strength specified on Drawings. Note that concrete designed in accordance with water/cementing materials ratio of Table 14 may yield strength exceeding minimum strength specified on Drawings.
.1 Class of exposure C-2 with 25 percent Portland cement replaced with cementitious hydraulic slag: for pavements, sidewalks, curbs and gutters.

.2 Class of exposure F-2 with 25 percent Portland cement replaced with cementitious hydraulic slag: for grade beams, and for exposed exterior beams, columns, walls and slabs.

.3 Slabs-on-Grade:

.1 Use type 20 Portland cement, or replace 35 percent Portland cement with cementitious hydraulic slag.

.2 When mean daily temperature exceeds 25 ° C at time of placement, replace 25 percent of type 20 cement, or 50 percent of type 10 cement, with cementitious hydraulic slag.

.3 Use water/cementing materials ratio 0.45 maximum.

.4 Use aggregates specified in paragraphs 2.1.3.

.5 Cementing materials content 325 kg/m.

.6 Modulus of rupture 3.5 MPa average, 3.0 MPa minimum.

.7 Slump at delivery, before addition of superplasticizer, 50 mm; add superplasticizer, not water, to bring slump to level acceptable to floor finisher for placement.

.4 Interior Concrete, other than specified above, and not exposed to freezing and thawing or the application of deicing chemicals: select water/cementing materials ratio and cementing materials content on basis of strength, workability, and finishing requirements.

.3 Submit evidence, and material samples, if requested, acceptable to the Inspection and Testing Company, to verify that the proposed concrete mix design will produce specified quality of concrete.

.4 List all proposed admixtures in mix design submission. Do not change or add admixtures to approved design mixes without Consultants approval.

.5 Concrete Weight: Air dry unit weight: minimum 2,300 kg/m; adjusted proportionally for maximum air content listed in CSA A23.1, Clause 15, Table 10.

2.3 Admixtures

.1 Chemical Admixture: To ASTM C494. Incorporate water-reducing admixture, type WN, in all concrete.

.2 Air Entraining Agent: To ASTM C260. Incorporate air-entraining agent in addition to chemical admixture in concrete of relevant Class of exposure, in accordance with CSA A23.1, Clause 15, Table 10.

.3 Chloride: Do not use calcium chloride or admixtures containing chloride in concrete.

2.4 Concrete Toppings

.1 Provide topping with minimum 28 day compressive strength of 32 MPa.

2.5 Premixed Grout

.1 Non-Shrink Metallic: Non-catalyzed metallic grout to ASTM C1107, Compressive strength at 28 days: 48 MPa.

.2 Non-Shrink, Non Stain, Non-Metallic: to ASTM C1107. Compressive strength at 28 days: 59 MPa.

.3 Flowable Grout: High-tolerance Non-shrink, Non-metallic shrinkage compensating grout to ASTM C1107. Compressive strength at 28 days: 59 MPa.

PART 3 EXECUTION

3.1 Examination

.1 Before starting this work, examine work done by others which effects this work.

.2 Notify Consultant of any condition which would prejudice proper completion of this work.

.3 Confirm that surfaces on which concrete is to be placed are free of frost and water before placing.

.4 Confirm that reinforcement, dowels, control joints, inserts and all other built in work are in place and secured.

.5 Commencement of work implies acceptance of existing conditions.

3.2 Treatment of Formed Surfaces

.1 Conform to the requirements of CSA A23.1, and as additionally specified herein.

.2 Treat concrete surfaces which will be exposed or painted in the completed building to provide a "Smooth Rubbed Finish" in accordance with CSA A23.1, uniform in colour and texture.

.3 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 which will not stain concrete, as recommended by manufacturer.

.4 Obtain Consultant's approval of finished exposed concrete and grind or otherwise correct to the satisfaction of the Consultant.

3.3 Placing Concrete

.1 Place concrete in accordance with requirements CSA A23.1/A23.2.

.2 Notify Consultant and inspection and testing firm at least 24 hours prior to commencement of concrete placing operation and 24 hours before wall forms are closed in.

.3 Obtain Geotechnical Engineer’s confirmation that thickness, elevation and compaction of sub-grade meets specifications before placing concrete.

.4 Do not place concrete in water or open frozen surfaces.

.5 Remove contaminants which lessen concrete bond to reinforcement before concrete is placed.

.6 Maintain accurate records of cast in place concrete items. Record date, location of pour, quantity, air temperature and test samples taken.

.7 Ensure that reinforcement, inserts, embedded items, formed expansion joints and the like, are not disturbed during concrete placement.

.8 Joint fillers:
- .1 Furnish filler for each joint in single piece for depth and width required for joint, unless otherwise authorized by Consultant.
- .2 When more than one piece is required for joint, fasten abutting ends and hold securely to shape by stapling or other positive fastening.
- .3 Locate and form isolation, construction and expansion joints as indicated.
- .4 Install joint filler.
- .5 Use 12 mm thick joint filler to separate slabs-on-grade from vertical surfaces and extend joint filler from bottom of slab to within 12 mm of finished slab surface unless indicated otherwise.

.9 Provide construction joint as indicated on the drawings. Ensure dowels are adequately anchored and placed at right angles to the joint before placing concrete.

.10 Place floor slabs to depth indicated on the drawings with 25 MPa minimum concrete unless otherwise noted on drawings but consistent with minimum cement content specified for exposed floors in this specification.

.11 Sloping Surfaces and Slabs: commence concrete placement at bottom of sloping surfaces.

3.4 Finishing Concrete

.1 Perform finishing operations on plastic concrete surfaces in accordance with CSA A23.1, and as specified herein.

.2 Refer to the drawings for floor finishes and coverings.

.3 Screed the top of rough floor slabs to an even level or sloping surface at the proper elevation to receive the finish or topping specified on the drawings and in finish schedule.

.4 Provide a smooth steel trowel finish on all areas scheduled to receive a covering, or painted finish.

.5 Exposed Floor Surfaces: Provide hard, smooth, dense, steel troweled surface, free from blemishes, and of uniform appearance.

.6 Non-slip Surfaces: Provide swirl trowel or broom finish of texture acceptable to Consultant.

.7 Curb Edging: Finish external corners of curbs rounded and smooth.

.8 Hardened Floor Finish:
- .1 Apply premixed material to total of 7.5 kg/m² of floor surface.
- .2 Apply in two shakes, of half total specified amount in each shake; the second shake at right angles to the first.
- .3 Follow manufacturer's special finishing instructions if concrete is air entrained.

3.5 Curing

.1 Cure concrete in accordance with CSA A23.1 and as specified herein.

.2 Curing Compound Method:
- .1 Use curing and sealing compound specified except:
  - .1 On surfaces to receive epoxy or similar paint finish.

.2 On surfaces to which architectural finishes will be adhered, the adhesives for which are incompatible with the curing compound.
.3 Air-entrained concrete for exterior slabs and sidewalks placed between October 1st and March 31st.

.3 Select acrylic water compound except that if ambient conditions extend drying time unduly and if area is well ventilated and unoccupied by other workers, solvent based compound may be used.

.4 Apply curing compound in accordance with manufacturer's instructions, increasing application rate as necessary to cover surface completely.

.5 Curing Blanket or Wet Burlap Method: For exterior sidewalks and other finished concrete surfaces that will be exposed to freezing and thawing or deicing chemicals:
.1 Cover with curing blanket or wet burlap overlaid with 0.102 mm thick polyethylene and maintain in place for the additional curing for durability period in accordance with CSA A23.1 but in no case for less than 7 days.
.2 Wet blanket or burlap regularly to maintain in moist condition. Do not allow to dry out.

.6 Cure finished concrete surface with an approved curing and sealing compound which will leave the surface with a uniform appearance and with a minimum of discolouration after drying. Ensure that the curing compound will be compatible with the architectural finishes or adhesives for finishes to be applied later. Apply the compound in strict accordance with the manufacturer's instructions.

.7 Protect surface which will be exposed to direct sunlight during the curing period, with a light coloured, laminated waterproof paper immediately after the curing and sealing compound has hardened sufficiently for the paper to be placed without damage to the sealed surface. Lap the paper a minimum of 100 mm and seal the laps. Leave the paper in place for at least seven days.

3.6 Grouting

.1 Mix prepackaged grout with water in accordance with manufacturer's printed instructions.

.2 Dampen concrete surfaces immediately before installing grout.

.3 Use non-shrink and shrinkage-compensating grouts only when grout will be contained against expansion and self-disintegration.

.4 Slope grout beyond edge of plate at 45 degrees.

.5 Provide same environmental protection and curing as specified for concrete.

3.7 Joint Sealant

.1 Apply sealant specified in Section 07 92 00 to thoroughly dry surfaces only, at ambient air temperatures above 5 ° C.

.2 Provide sealant on top of joint filler with a polyethylene bond breaker between joint filler and joint sealant applied in accordance with manufacturer's direction.

.3 Confirm that preformed joint filler and backer rod are compatible with sealant.

.4 Caulk joints in accordance with the following:
- .1 Do not commence joint preparation until concrete is at least 28 days old.
- .2 Thoroughly clean sides of joints with mason's router, or power saw, equipped with double blade where necessary to suit joint width.
- .3 Blow clean with compressed air with oil trap on line, or vacuum clean.
- .4 Install backer rod of diameter 25 percent greater than joint width, and type recommended by sealant manufacturer to be compatible with sealant. Locate backer rod to provide for sealant depth of one-half joint width, but not less than 12 mm.
- .5 Prime joint if required, as recommended by sealant manufacturer.

3.8 Defective Work

.1 Variations in excess of specified tolerances and marked and disfigured surfaces that cannot be repaired by approved methods will be considered defective work.

.2 Replace or modify concrete that is out of place or does not conform to lines, detail or grade as directed by the Consultant.

.3 Replace or repair defectively placed or finished concrete as directed by the Consultant.

.4 Testing and Replacement of Deficient Concrete in Place:
- .1 Pay for additional testing and related expenses if concrete has proven to be deficient.
- .2 Replace or strengthen deficient concrete work as directed by the Consultant, and pay for all testing and related expenses for replaced work until approved by the Consultant.

3.9 Cleaning

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

.2 Clear away from the building site excess and waste materials and debris resulting from Work of this Section.

End of Section

PART 1 GENERAL

1.1 General

.1 Conform to the requirements of Division 1.

1.2 Related Sections

.1 Section 04 22 00 Concrete Unit Masonry
.2 Section 04 27 00 Multiple Wythe Unit Masonry
.3 Section 05 12 23 Structural Steel
.4 Section 05 41 00 Structural Metal Stud Framing
.5 Section 05 50 00 Metal Fabrications

1.3 References

.1 ASTM International (ASTM)
  .1 ASTM A153/A153M-16a Standard Specification for Zinc Coating (Hot-Dip) on Iron and Steel Hardware
.2 CSA Group (CSA)
  .1 CSA A23.1-14/A23.2-14 Concrete Materials and Methods of Concrete Construction / Test Methods and Standard Practices for Concrete.
  .2 CSA S304-14 Design of Masonry Structures.
  .3 CSA A370-14 Connectors for Masonry.
  .4 CAN/CSA A371-14 Masonry Construction for Buildings.
  .5 CSA G30.3-M1983 (R1998) Cold-Drawn Steel Wire for Concrete Reinforcement.
  .6 CSA G30.18-09 (R2014) Carbon Steel Bars for Concrete Reinforcement
  .7 CSA W186-M1990 (R2016) Welding of Reinforcing Bars in Reinforced Concrete Construction
.3 American Concrete Institute (ACI)
  .1 Detailing Manual
.4 Reinforcing Steel Institute of Canada (RSIC)
  .1 Reinforcing Steel Manual of Standard Practice

1.4 Submittals

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

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

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

.4 Shop Drawings:
  .1 Submit shop drawings for all masonry reinforcing. Include placing drawings, bar lists and details. Indicate clearly reinforcing bar sizes, spacing, bending details, lap details, dowels to adjacent construction location and quantities of reinforcement and connectors.
  .2 Prepare placing drawings and bar lists in accordance with the American Concrete Institute (ACI) Detailing Manual, and the Reinforcing Steel Institute of Canada (RSIC) Reinforcing Steel Manual of Standard Practice, the typical details included with Contract Documents.
  .3 Prepare placing drawings to minimum scale of 1:50.

.4 Submit placing drawings and bar lists sufficiently detailed and dimensioned to permit correct placement of reinforcement and accessories without reference to architectural or structural Drawings.
.5 Show reinforcement, including dowels, in elevation on placing drawings for wall reinforcement.
.6 Show cover to reinforcement.
.7 Show location of construction joints.

1.5 Design Criteria

.1 Non-conventional Masonry Connectors
.1 Deflection: maximum 2.0 mm, including free play when acted upon by 0.45 kN lateral load, in all possible positions of adjustment.
.2 Positive restraint at position of maximum adjustment.

.2 Multi-component Ties - Free Play: Maximum 1.2 mm, when assembled in any possible configuration.

1.6 Shipping, Handling and Storage

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

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

1.7 Waste Management and Disposal

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

PART 2 PRODUCTS

2.1 Materials

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

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

.3 Column Ties: Fero CAT Tie (Column Adjustable Tie), spot weld to columns at 400 mm c/c.

.4 Connectors: to CSA A370 and CSA S304.
.1 Finish: Steel components, hot dip galvanized to CAN/CSA A370.
.2 For steel stud/masonry veneer application; length to suit combined total wall thickness; with polyethylene insulation support where required: Side Mounting Rap Ties by Fero Corporation
.3 Side Mounting Rap Ties:
.1 Flat-Plate: Length to suit steel stud width and thickness of gypsum sheathing, membrane and insulation.
.2 V-Tie: Length to provide placement of legs at centerline of solid unit veneer.
.3 Insulation support.
.4 Strip Ties: Prescriptive corrugated strip tie. 100 mm x 22 mm x 0.91 mm thick corrugated tie conforming to CSA A370.

.5 Wire Reinforcement: To CSA A371 and CSA G30.3.
.1 Masonry Veneer Walls: To CSA A370, hot dipped galvanized to ASTM A153, Class B2, Plex-0-Lok Seismic Tie, BL-407

.2 Interior walls: hot dipped galvanized to CSA S304
  .1 4.76 mm wire diameter hot dipped galvanized to CSA S304 for interior bearing walls.
  .2 3.66 mm wire diameter bright wire finish, standard duty for interior non-bearing walls and partitions
  .3 Truss Type: Blok-Trus BL-30 by Blok-Lok Ltd. for non-vertically reinforced walls
  .4 Ladder Type: Blok-Trus BL-10 by Blok-Lok Ltd. for vertically reinforced walls

.6 Equivalent products as manufactured by the following manufacturer's may be used subject to submission and acceptance by the Consultant of technical data:
  .1 Dayton Superior Dur-O-Wall
  .2 Hohmann and Barnard Inc.

2.2 Fabrication

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

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

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

.4 Ship reinforcement clearly identified in accordance with drawings.

PART 3 EXECUTION

3.1 Installation

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

3.2 Reinforcement

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

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

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

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

.5 All block cores containing vertical reinforcing and/or anchor bolts shall be solidly filled with non-shrink grout.

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

.7 Cleanouts: Provide cleanouts in the bottom course of masonry for each grout pour when the grout pour height exceeds 1.5 m.

.8 Construct cleanouts so that the space to be grouted can be cleaned and inspected. In solid grouted masonry, space cleanouts horizontally a maximum of 800 mm on center.

.9 Construct cleanouts with an opening of sufficient size to permit removal of debris. The minimum opening dimension shall be 76 mm.

.10 After cleaning, close cleanouts with closures braced to resist grout pressure.

3.3 Bonding and Tying

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

.2 Bond walls of two or more wythes using seismic connectors and ladder type reinforcement in accordance with NBC CSA S304, CSA A371 and as indicated.

.3 Tie masonry veneer to backing in accordance with CSA S304, CSA A371 and as indicated herein.

3.4 Reinforced Lintels and Bond Beams

.1 Reinforce masonry lintels and bond beams as indicated.

.2 Place and grout reinforcement in accordance with CSA S304.

3.5 Metal Anchors

.1 Do metal anchors as indicated.

3.6 Lateral Support and Anchorage

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

3.7 Control Joints

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

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

3.8 Field Bending

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

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

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

3.9 Field Touch Up

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

3.10 Cleaning

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

End of Section

PART 1 GENERAL

1.1 General

.1 Conform to the requirements of Division 1.

1.2 Related Sections

.1	Section 03 10 00	Concrete Forming and Accessories
.2	Section 03 20 00	Concrete Reinforcing
.3	Section 03 30 00	Cast-in-Place Concrete
.4	Section 04 05 19	Masonry Anchorage and Reinforcing
.5	Section 05 12 23	Structural Steel
.6	Section 05 50 00	Metal Fabrications
.7	Section 06 10 00	Rough Carpentry
.8	Section 07 84 00	Firestopping
.9	Section 07 92 00	Joint Sealants
.10	Section 08 11 00	Metal Doors and Frames
.11	Section 09 21 16	Gypsum Board
.12	Section 09 91 23	Interior Painting

1.3 References

.1 ASTM International (ASTM)
- .1 ASTM C90-16a Standard Specification for Loadbearing Concrete Masonry Units
- .2 ASTM C129-17 Standard Specification for Nonloadbearing Concrete Masonry Units
- .3 ASTM C150/C150M-18 Standard Specification for Portland Cement
- .4 ASTM C207-18 Standard Specification for Hydrated Lime for Masonry Purposes.
- .5 ASTM D2240-15e1 Standard Test Method for Rubber Property—Durometer Hardness.
- .6 ASTM D5249-10 (2016) Standard Specification for Backer Material for Use with Cold and Hot Applied Joint Sealants in Portland Cement Concrete and Asphalt Joints.

.2 CSA Group (CSA)
- .1 CSA A23.1-14/A23.2-14 Concrete Materials and Methods of Concrete Construction / Test Methods and Standard Practices for Concrete.
- .2 CAN/CSA A165 Series-14 CSA Standards on Concrete Masonry Units.
- .3 CAN/CSA A179-14 Mortar and Grout for Unit Masonry,
- .4 CAN3-A370-14 Connectors for Masonry.
- .5 CAN/CSA A371-14 Masonry Construction for Buildings.
- .6 CSA S304-14 Design of Masonry Structures.

.3 Canadian Concrete Masonry Producers Association (CCMPA) Quality Assurance Program.

1.4 Submittals

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

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

.3 Submit the following samples:
- .1 Two (2) of each type of concrete masonry units specified.
- .2 Two (2) of each type of masonry accessory specified.

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

.5 Submit engineered temporary bracing design drawings for temporary support of masonry walls. Drawings shall be prepared by, and bear the seal of a Professional Engineer, licensed in the Province of Ontario.

.6 Certificates: submit product certificates signed by manufacturer certifying materials comply with specified performance characteristics and criteria and physical requirements.

.7 Inspection Reports: Inspection and Testing Company shall submit reports of inspections and tests.
- .1 Distribute inspection reports as follows:
  - .1 Consultant.
  - .2 Structural Engineer
  - .3 Contractor.

1.5 Quality Assurance

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

.2 Pre-installation meeting: conduct pre-installation meeting to verify project requirements manufacturer's instructions and manufacturer's warranty requirements.

.3 Field Quality Control:
- .1 Inspection and testing will be carried out by Testing Laboratory designated by Owner.
- .2 Payment for specified Work performed by Inspection and Testing Company will be made from Cash Allowance.
- .3 Inspection and Testing Company shall perform sampling, inspection and testing of masonry work at site, in accordance with referenced standards, including but not limited to the following:
  - .1 Masonry Placement Inspection
  - .2 Reinforcing Steel Placement
  - .3 Grout and Mortar Testing
  - .4 CMU Testing
- .4 Review provided by Inspection and Testing Company does not relieve Contractor of his sole responsibility for quality control over Work. Performance or non-performance of Inspection and Testing Company shall not limit, reduce, or relieve Contractor of his responsibilities in complying with the requirements of the Specification.
- .5 Provide access to Work for inspectors.

1.6 Shipping, Handling and Storage

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

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

.3 Materials shall be kept clean and dry.

.4 Deliver cement, lime and mortar ingredients with manufacturer's seal and labels intact.

.5 Cementitious material and aggregates shall be stored in accordance with the requirements of CSA A23.1.

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

1.7 Project Conditions

.1 Provide heat enclosures and heat as required.

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

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

.4 Keep masonry dry using secure waterproof, non-staining coverings that extend over walls and down sides sufficient to protect walls from wind driven snow, rain and dirt, until masonry work is completed and protected by flashings or other permanent construction.

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

1.8 Waste Management and Disposal

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

PART 2 PRODUCTS

2.1 Materials

.1 Masonry Units: Concrete Block: Modular, conforming to CCMPA requirements and CAN/CSA A165.1.
  .1 H/20/A/M concrete masonry units to be used at all load bearing masonry walls.
  .2 H/15/A/M concrete, masonry units, at all other locations unless noted otherwise.
  .3 SS/15/A/M semi-solid concrete masonry units to be used at all 2 hour rated fire walls.
  .4 Refer to drawings for Fire Resistance Ratings. Type of concrete and block to conform to Table 5.0, Fire Resistance Rating of Concrete Block in Hours, of the Canadian Concrete Masonry Producers Association Handbook.
  .5 Special shapes: provide special shapes indicated or required including bullnose and corner blocks, base blocks, fillers, and the like as may be required. Provide purpose made shapes for lintels and bond beams.
  .6 Exposed block shall all be made by one manufacturer and shall be uniform in colour, shade and texture.

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

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

.4 Pre-manufactured Masonry Control Joint: Pre-manufactured polyvinylchloride control joints may be used in lieu of the specified built-up type of joint.

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

.6 Grout: to CAN/CSA A179, Table 3: Premixed, non-shrink non-metallic grout.

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

2.2 Mixes

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

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

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

2.3 Damp Course and Flashings

.1 Peel and stick modified SBS bitumen membrane reinforced with proprietary glass screen, minimum thickness of 1.0 mm.

.2 Lap Sealant: recommended by flashing manufacturer.

2.4 Accessories

.1 Mechanical Fasteners: As recommended by manufacturer of material to be fastened, and in accordance with the reference standards, corrosion resistant.

PART 3 EXECUTION

3.1 Examination

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

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

3.2 General

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

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

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

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

3.3 Installation

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

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

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

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

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

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

.7 Bond intersecting block walls in alternate courses.

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

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

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

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

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

.13 Provide reinforced bond beams where indicated on structural drawings.

.14 Provide vertical reinforcement as indicated on structural drawings.

3.4 Exposed Masonry

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

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

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

.4 Provide bullnose block at all exposed masonry corners.

3.5 Tolerances

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

3.6 Reinforcement and Connectors

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

3.7 Concrete Masonry Lintels

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

.2 Lintels in non-load-bearing walls shall be constructed with special bond or lintel block units unless shown otherwise on plans. Lintels shall bear 200 mm minimum and bearing shall be isolated with two layers of heavy asphalt coated paper.

.3 Reinforcing steel in lintels shall be 2 x 20 M bars minimum specified under Section 04 05 19 - Masonry Anchorage and Reinforcing, or as noted on drawings.

.4 Concrete fill for lintels shall be 25 MPa or as noted on the drawings. Concrete shall be as specified in Section 03 30 00.

3.8 Loose Steel Lintels

.1 Install loose steel lintels. Centre over opening width.

.2 Lintels supplied under Section 05 50 00 – Metal Fabrications.

3.9 Control Joints

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

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

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

3.10 Support of Loads

.1 Use 25 MPa concrete unless specified otherwise on the Drawings, where concrete fill is used in lieu of solid units.

.2 Use grout to CAN/CSA A179 where grout is used in lieu of solid units.

.3 Install building paper below voids to be filled with grout. Keep paper 25 mm back from face of units.

3.11 Lateral Support and Anchorage

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

3.12 Grouting

.1 Grout masonry in accordance with CSA S304.1 and as indicated.

3.13 Temporary Wall Bracing

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

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

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

3.14 Built-ins

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

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

.3 Brace door jambs to maintain plumb. Fill voids between masonry and metal frames with masonry mortar or insulation, as indicated on drawings or as required to provide a neat finished appearance.

.4 Set wall plates on masonry in non-shrink grout in accordance with manufacturer's instructions.

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

3.15 Protection

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

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

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

3.16 Cleaning

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

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

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

End of Section

PART 1 GENERAL

1.1 General

.1 Conform to the requirements of Division 1.

1.2 Related Sections

.1 Section 03 30 00 Cast-in-Place Concrete
.2 Section 04 22 00 Concrete Unit Masonry
.3 Section 05 21 00 Steel Joists
.4 Section 05 31 00 Steel Deck
.5 Section 05 50 00 Metal Fabrications
.6 Section 09 91 23 Interior Painting

1.3 References

.1 ASTM International, (ASTM)
  .1 ASTM A108-13 Standard Specification for Steel Bar, Carbon and Alloy, Cold-Finished
  .2 ASTM A123/A123M-17 Standard Specification for Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products
  .3 ASTM A153/A153M-16a Standard Specification for Zinc Coating (Hot-Dip) on Iron and Steel Hardware
  .4 ASTM A307-14e1 Standard Specification for Carbon Steel Bolts, Studs, and Threaded Rod 60 000 PSI Tensile Strength
  .5 ASTM A325-14 Standard Specification for Structural Bolts, Steel, Heat Treated, 120/105 ksi Minimum Tensile Strength
  .6 ASTM A1011/A1011M-17 Standard Specification for Steel, Sheet and Strip, Hot-Rolled, Carbon, Structural, High-Strength Low-Alloy, High-Strength Low-Alloy with Improved Formability, and Ultra-High Strength
  .7 ASTM A490-14a Standard Specification for Structural Bolts, Alloy Steel, Heat Treated, 150 ksi Minimum Tensile Strength
  .8 ASTM A653/A653M-17 Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process
.2 CSA Group (CSA)
  .1 CSA G40.21-13 General Requirements for Rolled or Welded Structural Quality Steel.
  .2 CSA G164-18 Hot Dip Galvanizing of Irregularly Shaped Articles.
  .3 CSA S16-14 Design of Steel Structures.
  .4 CSA S136-07 North American Specification for the Design of Cold Formed Steel Structural Members, Includes Update No. 1 (2009), Update No. 2 (2010).
  .5 CSA-W47.1-09 Certification of Companies for Fusion Welding of Steel Structures.
  .6 CSA W48-18 Filler Metals and Allied Materials for Metal Arc Welding.
  .7 CSA-W55.3-08 (R2013) Resistance Welding Qualification Code for Fabricators of Structural Members Used in Buildings.
  .8 CSA W59-13 Welded Steel Construction (Metal Arc Welding).
  .9 CSA W178.1-18 Certification of Welding Inspection Organizations.
  .10 CSA W178.2-18 Certification of Welding Inspectors.
.3 Structural Steel Painting Council
  .1 SSPC-SP 6-91 Commercial Blast Cleaning.
.4 Canadian Institute of Steel Construction (CISC)/Canadian Paint Manufacturer's Association (CPMA)
  .1 CISC/CPMA 2-75 Quick-Drying, Primer for Use on Structural Steel.

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

.5 American Institute of Steel Construction (AISC)

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

.6 The National Building Code of Canada.

1.4 Submittals

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

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

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

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

.5 Show splice locations and details.

.6 Welded connections shall be designated by welding symbols in compliance with American Welding Society, AWS 2.068, Welding Symbols, and indicate clearly net weld lengths.

.7 Submit design calculations if requested by the Consultant.

.8 Submit diagrams showing methods of erection.

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

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

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

1.5 Qualifications

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

1.6 Quality Assurance

.1 Connections:

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

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

.3 Consultant will review connection arrangement to verify general conformance with overall design concept of structure.
.4 Connection design engineer shall be insured for professional liability in accordance with section 74 subsection (1) of Regulation 941 of the Ontario Professional Engineers Act. The alternative of compliance with subsection (2) is not acceptable.
.5 Provide connections adequate to resist reaction of beam, when beam is loaded to maximum flexural capacity under uniformly distributed load, unless reaction or connection detail is shown on Drawings.
.1 Provide flexible beam connections for unrestrained members in accordance with CSA S16.1, unless shown otherwise on Drawings.
.2 Select connections, wherever possible, from standard designs tabulated in current edition of CISC Handbook of Steel Construction, except that length of beam web angles shall not be less than half the depth of beam, and single angles shall not be used.
.3 Provide direct connections to flanges of spandrel beams (exterior perimeter beams) to restrain twisting.

.2 Design:
.1 Connections:
.1 Provide bolted or welded connections, unless shown otherwise on Drawings.
.2 Use high strength bolts to ASTM A325 or ASTM A490 for all connections.
.3 Use slip resistant (friction-type) connections for bolted joints designed to resist reversible forces.
.4 Provide tension adjustment hardware at rod type bracing and at flat bar type bracing.
.5 Do not permit connections to encroach on clearance lines required for installation of Work of other Sections.

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

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

1.7 Tolerances

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

1.8 Inspection and Testing

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

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

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

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

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

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

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

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

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

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

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

1.9 Shipping, Handling and Storage

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

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

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

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

1.10 Waste Management and Disposal

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

PART 2 PRODUCTS

2.1 Materials

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

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

.3 High Strength Bolts: to meet specified requirements of ASTM A325.

.4 Machine Bolts: to meet specified requirements of ASTM A307.

.5 Anchor Bolts: to meet specified requirements of ASTM A307.

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

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

PART 3 EXECUTION

3.1 Fabrication

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

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

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

.4 Holes in Structural Members:
- .1 Punch holes 11 mm to 27 mm in diameter as required for attaching the work of other Sections to structural steel members. Locate holes so that no appreciable reduction of the strength of members is caused.
- .2 Provide holes for pipes and ducts, and reinforce openings as indicated on drawings. Cutting of holes in structural members in the field will not be permitted except with written approval of the Consultant.
- .3 Provide effective drainage holes to prevent the accumulation of water in tubular members.

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

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

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

.8 Structural Steel Painting: All prime painting shall be shop applied and the responsibility of the steel fabricator. Refer to specific priming requirements specified in Section 09 91 23 - Interior Painting.
- .1 Paint in accordance with manufacturer's published directions. Paint steel in the shop under cover. Keep painted members under cover until the paint has dried.
- .2 Clean and prepare surfaces, as appropriate for paint specified, in accordance with CISC/CPMA 2-75 or clean steel in compliance with SSPC SP6 where zinc rich paint is shop applied.
- .3 Where paint is applied adjacent to welded joints, remove it to bare metal for a distance of at least 50 mm beyond sides of joints.
- .4 Do not paint surfaces and edges to be field welded, contact surfaces of friction type connections assembled by high strength bolts, surfaces encased in or in contact with concrete.

.9 Galvanizing: Galvanize members as indicated and in accordance with reference standards, after shop welding is complete.
- .1 Steel members, fabrications, and assemblies shall be galvanized after fabrication by the hot dip process in accordance with CSA G164 or ASTM A123.
- .2 Bolts, nuts, washers, iron, and steel hardware components shall be galvanized in accordance with CSA G164 or ASTM A153.
- .3 Coating Requirements:
  - .1 Weight: the weight of the galvanized coating shall conform with Table 1 of CSA G164 or paragraph 6.1 of ASTM A123 and Table 1 of ASTM A153 (as appropriate).
  - .2 Surface Finish: The galvanized coating shall be continuous, adherent, as smooth and evenly distributed as possible and free from any defect that is detrimental to the stated end use of the coated article.
- .4 The integrity of the coating shall be determined by visual inspection and coating thickness measurements.
- .5 Adhesion: the galvanized coating shall be sufficiently adherent to withstand normal handling

3.2 Examination

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

3.3 Preparation

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

3.4 Erection

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

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

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

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

3.5 Coating Touch-Up

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

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

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

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

3.6 Field Quality Control

.1 Inspection and Testing Company, when appointed as specified in Source Quality Control elsewhere in this Section, shall perform:
.1 Inspection of erection and fit-up, including placing, plumbing, levelling and temporary bracing and conformance with specified tolerances.

.2 Inspection of bolted connections, including verification that ASTM A307, ASTM A325 snug tight only bolts, and ASTM A325 or ASTM A490 pre-tensioned bolts have been installed and used appropriately, and that threads are excluded from shear plane where required.
.3 Inspection of welded joints, including slag removal.
.4 General inspection of field cutting and alterations; report immediately to Consultant, any alterations or cutting not shown on reviewed shop drawings.
.5 General inspection of shop coating touch-up.
.6 Inspection of zinc primer and zinc-rich paint, including surface preparation and coating thickness.

3.7 Defective Work

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

.2 Replace defective Work, as directed by Consultant.

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

3.8 Cleaning

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

End of Section

PART 1 GENERAL

1.1 General

.1 Conform to the requirements of Division 1.

1.2 Related Sections

.1 Section 03 30 00 Cast-in-Place Concrete
.2 Section 05 12 23 Structural Steel
.3 Section 05 21 00 Steel Joists
.4 Section 05 50 00 Metal Fabrications
.5 Section 06 10 00 Rough Carpentry

1.3 References

.1 ASTM International, (ASTM)
  .1 ASTM A653/A653M-15E1 Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process
.2 CSA Group (CSA)
  .1 CSA S16-09 Design of Steel Structures
  .2 CSA S136-07 North American Specification for the Design of Cold Formed Steel Structural Members, Includes Update No. 1 (2009), Update No. 2 (2010)
  .3 CSA W47.1-09 Certification of Companies for Fusion Welding of Steel Structures.
  .4 CSA W48-06 (R2011) Filler Metals and Allied Materials for Metal Arc Welding
  .5 CSA W55.3-08 Resistance Welding Qualification Code for Fabricators of Structural Members Used in Buildings.
  .6 CSA W59-03 (R2008) Welded Steel Construction (Metal Arc Welding)
.3 Canadian General Standards Board (CGSB)
  .1 CAN/CGSB 1.181-99, Ready-Mixed Organic Zinc-Rich Coating
.4 Canadian Sheet Steel Building Institute (CSSBI)
  .1 CSSBI 10M Standard for Steel Roof Deck.
  .2 CSSBI 12M Standard for Composite Steel Deck.
  .3 CSSBI SSF 16-14 Acoustic Properties of Perforated Steel Deck

1.4 Submittals

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

.1 Submit drawings stamped and signed by qualified professional engineer registered or licensed in Province of Ontario, Canada. Each submission of the shop drawings shall bear the seal of the Engineer.
  .1 Indicate deck plan, profile, dimensions, base steel thickness, metallic coating designation, connections to supports and spacings, projections, openings, reinforcement details and accessories.
  .2 Indicate details of temporary shoring of steel deck.

.2 Submit design calculations if requested by Consultant.

1.5 Design Requirements

.1 Design steel deck using limit states design in accordance with CSA S136-07 and CSSBI 10M.

.2 Steel deck and connections to steel framing to carry dead, live and other loads including lateral loads, diaphragm action, and uplift as indicated.

.3 Deflection under specified live load not to exceed 1/240 of span, except that when gypsum board ceilings are hung directly from deck, live load deflection not to exceed 1/360 of span.

.4 Design composite deck sections in accordance with the National Building Code of Canada for concrete strength indicated on drawings.

.5 Where vibration effects are to be controlled as indicated, dynamic characteristics of decking system to be designed to be in accordance with CSA S16.

1.6 Shipping, Handling and Storage

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

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

1.7 Waste Management and Disposal

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

.2 Divert unused metal from landfill to metal recycling facility.

.3 Dispose of unused paint material at official hazardous material collections site.

.4 Do not dispose of unused paint material into sewer system, into streams, lakes, onto ground or in other location where it will pose health or environmental hazard.

PART 2 PRODUCTS

2.1 Materials

.1 Sheet Steel: ASTM A653 minimum Grade 230 with a base steel design thickness or 0.76 mm or greater and a minimum zinc-iron alloy coating designation of ZF75;

.2 Acoustic insulation: fibrous glass 17.5 kg/m3 density profiled to suit deck flutes.

.3 Closures: in accordance with manufacturer's recommendations.

.4 Cover plates, cell closures and flashings: steel sheet with minimum base steel thickness of 0.76 mm. Metallic coating same as deck material.

.5 Primer: zinc rich, ready mix to CAN/CGSB-1.181.

.6 Caulking: to Section 07 92 00- Joint Sealants.

.7 Shear studs: to CSA W59.

2.2 Types of Decking

.1 Deck shall conform to the depths noted on the drawings.

.2 Steel roof deck: to CSSBI 10M non-cellular, interlocking side laps.Base steel thickness, depth & profile as shown on the drawings.

PART 3 EXECUTION

3.1 General

.1 Structural steel work: in accordance with CSA S136 and CSSBI 10M.

.2 Welding: in accordance with CSA W59, except where specified otherwise.

.3 Companies to be certified under Division 1 or 2.1 of CSA W47.1 for fusion welding of steel and/or CSA W55.3 for resistance welding.

3.2 Erection

.1 Erect steel deck as indicated and in accordance with CSA S136, CSSBI 10M, CSSBI 12M and with reviewed erection drawings.

.2 Lap ends: to 50 mm minimum.

.3 Place and support reinforcing steel as indicated.

.4 Weld and test stud shear connectors through steel deck to steel joists/beams below in accordance with CSA W59.

.5 Immediately after deck is permanently secured in place, touch up metallic coated top surface with compatible primer where burned by welding.

.6 Prior to concrete placement, steel deck to be free of soil, debris, standing water, loose mil scale and other foreign matter.

.7 Temporary shoring, if required, to be designed to support construction loads, wet concrete and other construction equipment. Do not remove temporary shoring until concrete attains 75% of its specified 28 day compression strength.

3.3 Closures

.1 Install closures in accordance with approved details.

3.4 Openings and Areas of Concentrated Loads

.1 No reinforcement required for openings cut in deck which are smaller than 150 mm square.

.2 Frame deck openings with any one dimension between 150 to 300 mm as recommended by manufacturer, except as otherwise indicated.

.3 For deck openings with any one dimension greater than 300 mm and for areas of concentrated load, reinforce in accordance with structural framing details, except as otherwise indicated.

3.5 Connections

.1 Install connections in accordance with CSSBI recommendations as indicated.

3.6 Cleaning

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

End of Section

PART 1 GENERAL

1.1 General

.1 Conform to the requirements of Division 1.

1.2 Related Sections

.1 Section 04 05 19 Masonry Anchorage and Reinforcing
.2 Section 05 12 23 Structural Steel
.3 Section 07 21 13 Building Insulation
.4 Section 07 26 00 Vapour Retarders
.5 Section 07 92 00 Joint Sealants
.6 Section 08 50 00 Aluminum Doors, Windows and Screens
.7 Section 09 21 16 Gypsum Board

1.3 References

.1 The National Building Code of Canada.
.2 The Ontario Building Code.
.3 ASTM International (ASTM)
  .1 ASTM A879/A879M-12(2017) Standard Specification for Steel Sheet, Zinc Coated by the Electrolytic Process for Applications Requiring Designation of the Coating Mass on Each Surface
  .2 ASTM A653/A653M-18 Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process
  .3 ASTM A792/A792M-10 (2015) Standard Specification for Steel Sheet, 55 % Aluminum-Zinc Alloy-Coated by the Hot-Dip Process
  .4 ASTM A1003/A1003M-15 Standard Specification for Steel Sheet, Carbon, Metallic- and Nonmetallic-Coated for Cold-Formed Framing Members
  .5 ASTM C955-18e1 Standard Specification for Cold-Formed Steel Structural Framing Members
  .6 ASTM C1007-11a(2015) Standard Specification for Installation of Load Bearing (Transverse and Axial) Steel Studs and Related Accessories
.4 American National Standards Institute (ANSI)
  .1 ANSI/AWSD1.3, Structural Welding Code-Sheet Steel.
.5 CSA Group (CSA)
  .1 CSA G164-18 Hot Dip Galvanizing of Irregularly Shaped Articles.
  .2 CSA S16.1-M Limit States Design of Steel Structures.
  .3 CSA S136-12 Cold Formed Steel Structural Members.
  .4 CSA W47.1 Certification of Companies for Fusion Welding of Steel Structures.
  .5 CSA W59 Welded Steel Construction (Metal-Arc Welding).
  .6 CSA W178.1 Certification of Welding Inspection Organizations
  .7 CSA W178.2 Certification of Welding Inspectors
.6 Canadian General Services Board (CGSB)
  .1 CGSB 1-GP-181M Standard for Coating, Zinc Rich, Organic Ready Mix.
.7 Canadian Sheet Steel Building Institute (CSSBI)
  .1 CSSBI 51-06 Lightweight Steel Framing Design Manual.
  .2 CSSBI S6-90 Guide Specification for Lightweight Steel Framing.

1.4 Submittals

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

.2 Submit shop drawings indicating layout and details of fabrication and erection. Indicate member sizes and gauges of materials, framing, method of fastenings, spacing of all members, bridging and bracing. Indicate design loads.

.3 Indicate all framing systems including exterior and interior framing and soffits.

.4 Lightweight steel framing systems shall be designed by, and each shop drawing shall bear the stamp of a registered Professional Engineer licensed to practice in the Province of Ontario. Each submission of the shop drawings shall bear the seal of the Engineer.

.5 Submit engineering design calculations or data verifying the capacity of the members and the ability of the assemblies to meet the design requirements.

.6 Detail welded connections using standards symbols for welded joints as published in current CISC Handbook of Steel Construction.

.7 Submit field review reports specified in Section 3.7 within 3 working days of each inspection. Reports shall be submitted directly from the Design Engineer to the Consultant.

.8 Submit mill test reports covering chemical and mechanical properties of steel, and coating designation.

.9 Inspection Reports: Inspection and Testing company shall:
- .1 Submit reports at least weekly when the work of this Section is in progress.
- .2 Distribute inspection reports as follows:
  - .1 General Contractor.
  - .2 Consultant.
  - .3 Owner.
  - .4 Lightweight Steel Framing fabricator.
- .3 Sign report by inspector who performs inspection, describing progress of work, deficiencies observed and corrective action taken.
- .4 Include deficiency list of outstanding items from previous reports, and comment on status.

1.5 Qualifications

.1 Contractor undertaking work of this Section shall have a minimum of 5 years of experience in lightweight steel framing.

.2 Design of lightweight steel framing shall be by a Professional Engineer licensed in the Province of Ontario, experienced in lightweight steel framing design.
- .1 Lightweight steel framing design engineer shall be insured against professional liability in accordance with section 74 subsection (1) of Regulation 941 of the Ontario Professional Engineers Act. The alternative of compliance with subsection (2) is not acceptable.

.3 Consultant will review lightweight steel framing to verify general conformance with overall design concept of the structure.

.4 Companies engaged in welding shall be certified by the Canadian Welding Bureau to CSA Standard W47.1. Companies shall have welding procedures approved and welders qualified for the base material types and thicknesses that are to be welded.

.5 Undertake welding only by fabricators certified by Canadian Welding Bureau under Division 1 or 2.1. Use welders qualified for the base material types and thicknesses that are to be welded.

1.6 Design

.1 Design shall be based on Limit States Design Principles using factored loads and resistances.

.2 Loads and load factors shall be in accordance with the National Building Code of Canada.

.3 Resistances and resistance factors shall be determined in accordance with the National Building Code and CSA S136.

.4 Maximum allowable deflection of metal studs under specified loads shall be L/600.

.5 Design bridging as necessary to align members during erection, and to provide necessary structural integrity during construction and in the completed structure. Design bridging to prevent member rotation and translation perpendicular to the minor axis.

.6 Design lintels over all openings in accordance with the National Building Code.

.7 Design components or assemblies to accommodate specified erection tolerances.

.8 Member spacing shall not exceed the spacing indicated on the drawings.

.9 Allow for movement of the structure. Design wind bearing stud end connections to accommodate floor/roof deflections such that the studs are not loaded axially.

.10 Connections between lightweight steel framing members shall be by bolts, welding or sheet metal screws.

.11 Resistances for sheet metal screws shall be based on the manufacturer’s lower bound test values multiplied by the appropriate resistance factor, ∅c, given in CSA S136.

.12 Provide bridging at spacing to satisfy structural requirements, but not at greater than the following: at the lesser of 1500 mm or 1/4 of span, for joists and rafters.

.13 Neglect contribution of sheathing to restrain member rotation and translation perpendicular to the minor access.

.14 Design bracing system to limit lateral deflections of building components under wind or seismic load to height/500.

.15 Use bolts, welding or sheet metal screws to make connections between lightweight framing members.

.16 Determine sheet metal screw capacities in accordance with CSA S136.

.17 Design top and bottom tracks to transfer joint and member loads, but not less than one gauge size thicker than the wall stud thickness.

.18 Design connections to masonry walls to stabilize the walls and resist lateral forces due to wind and seismic forces.

1.7 Protection

.1 Provide and maintain adequate temporary bracing for all work of this Section until permanent lateral support is in place.

1.8 Shipping, Handling and Storage

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

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

.3 Use all means necessary to protect all materials before, during and after installation and to protect the installed work and materials of other trades affected by this work.

.4 In the event of damage, immediately make all repairs and replacements necessary to the approval of the Consultant and at no additional cost to the Owner.

.5 Store lightweight steel framing members on site, flat. Protect from contact with ground.

1.9 Waste Management and Disposal

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

PART 2 PRODUCTS

2.1 Metal Stud Framing

.1 Steel to ASTM A1003 Minimum grade, Grade 'D', 50 ksi yield, galvanized Z180 coating.

.2 Thickness, exclusive of coating: not less than 1.22 mm. Use thicker material where required by Engineered design to satisfy structural requirements. Comply with thickness tolerance requirements of CSA S136. Material thicknesses shall be greater than or equal to the specified thicknesses with underruns not to exceed the tolerance requirements of CSA S136.
.1 Thicknesses of framing members specified or indicated on drawings is exclusive of galvanized coating.

.3 Stud sizes as indicated on the drawings.

.4 Provide all necessary tracks, bridging, fasteners, hardware and other accessories as required for a complete installation.

.5 Provide double or triple stud arrangements at locations where support of interior or exterior fixtures, fittings and accessories is required.

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

2.2 Fastenings

.1 Sheet Metal Screws: self-tapping with a minimum coating thickness of 0.008 microns of zinc or cadmium. Screws shall have low profile heads where covered by sheathing.

.2 Sheathing Screws: As specified in Section 09 21 16.

.3 Welding Electrodes: to CSA W59, 480 mPa minimum tensile strength series.

.4 Anchors: appropriate anchors sized to suit loads, substrate material, and edge distances, manufactured by Hilti Canada or Confast, installed as per manufacturer's recommendations.

2.3 Accessories

.1 Deflections Tracks and Slide Clips: Manufacturer's standard telescoping or slotted tracks to suit design and load conditions.

2.4 Sheathing

.1 As specified in Section 09 21 16 – Gypsum Board.

PART 3 EXECUTION

3.1 General

.1 Fabrication and erection shall conform to the reviewed shop drawings. Modifications required to accommodate as-built conditions (other than minor dimensional changes) shall be submitted for review.

.2 Provide Lightweight Steel Framing systems at exterior wall locations where indicated.

3.2 Welding

.1 Welds shall conform to CSA W59.

.2 For metal less than 3.0 mm thick, shop drawings may show nominal weld leg sizes. For such material, the effective throats of welds shall not be less than the thickness of the thinnest connected part.

.3 Touch-up welds with zinc rich paint.

3.3 Screws

.1 Steel screws shall equal or exceed the minimum diameter indicated on the shop drawings.

.2 Penetration beyond joined materials shall be not less than 3 exposed threads.

3.4 Fabrication

.1 Where specified, provide cut-outs centred in the webs of members to accommodate services. Unreinforced cut-outs shall be limited to the dimensions in CSSBI 51-06. The effect of cut-outs on the strength and stiffness of the member shall be considered.

.2 Fabrication tolerances for members shall conform CSSBI 51.

.3 The steel thickness exclusive of coating shall be marked on each member by embossing, stamping with indelible ink or by colour coding.

3.5 Erection

.1 Comply with requirements of ASTM C1007.

.2 Lightweight steel framing shall be erected true and plumb within the specified tolerances.

.3 Temporary bracing shall be employed wherever necessary to withstand all loads to which the structure may be subject during erection and subsequent construction. Temporary bracing shall be left in place as long as required for the safety and integrity of the structure. Ensure that during erection, a margin of safety consistent with the requirements of the National Building Code and CSA S136 exists in the uncompleted structure.

.4 Erection Tolerances:
- .1 For the purposes of this Section, camber is defined as the deviation from straightness of a member or any portion of a member with respect to its major axis, and sweep is defined as the deviation from straightness of a member or any portion of a member with respect to its minor axis.
- .2 For axial load bearing studs, out of plumbness and out of straightness (camber and sweep) shall not exceed 1/1000th of the member length.
- .3 For wind bearing studs, out of plumbness shall not exceed 1/500th of the member length.
- .4 For track, camber shall not exceed 1/1000th of the member length.
- .5 Studs shall seat into top and bottom tracks. The gap between the end of the stud and the web of the track shall not exceed 1.6mm for axial load bearing studs or 5 mm for wind bearing studs.
- .6 Spacing of studs shall not be more than 3.0mm from the design spacing. The cumulative error in spacing shall not exceed the requirements of the finishing materials.

.5 Make all field measurements necessary to insure the proper fit of all members.

.6 Cutting of members may be by saw or shear. Torch cutting is not permitted.

.7 All axially loaded members shall be aligned vertically to allow for full transfer of the loads down to the foundation. Vertical alignment shall be maintained at floor/wall intersections.

.8 Completed bearing shall be maintained under tracks to provide for load transfer in axially loaded assemblies. Any discrepancy shall be brought to the attention of the Consultant.

.9 Holes that are field cut into lightweight steel framing members shall conform to the requirements of CSSBI 51.

.10 Splicing of axial load bearing members is not permitted.

.11 Insulation shall be placed in all jamb and header assemblies that will be inaccessible after their installation into the wall. Ensure that insulation is kept dry and not compressed. Use fibrous fill insulation as specified under Section 07 21 13.

.12 Handling and lifting of prefabricated panels shall not cause permanent distortion to any member or collateral material.

.13 Thoroughly inspect installation prior to application of covering materials and touch up all scratched or otherwise damaged surfaces with a heavy coating of zinc rich paint.

3.6 Sheathing

.1 Water resistant gypsum sheathing shall be installed horizontally on all walls. Refer to Section 09 21 16.

3.7 Inspection

.1 The lightweight steel framing Design Engineer, responsible for the production of the shop drawings, shall provide periodic field review during construction and shall submit reports in accordance with Section 1.4.
  .1 The cost of this field review shall be paid for by the Contractor.

.2 Additional inspection and testing of materials and workmanship shall be carried out by a qualified Independent Inspection Agency appointed by the Consultant.
  .1 The cost of this additional inspection shall be paid for out of the Cash Allowances for Inspection and Testing.
  .2 Any testing or inspection required by the Consultant because of an error by the Contractor or due to departure from the contract documents by the Contractor, shall be paid for by the Contractor.
  .3 Inspection shall include:
    .1 Checking that mill test reports are properly correlated to materials.
    .2 Sampling fabrication and erection procedures for general conformity to the requirements of the specification.
    .3 Checking that the welding conforms to the requirements of this specification.
    .4 Checking fabricated members against specified member shapes.
    .5 Visual inspection of all welded connections including sample checking of joint preparation and fit-up.
    .6 Sample checking of screwed and bolted joints.
    .7 Sample checking that tolerances are not exceeded during fit-up or erection.
    .8 Additional inspection and testing of welded connections as required by CSA W59.
    .9 General inspection of field cutting and alterations required by other trades.
    .10 Submission of reports to the Consultant, the Contractor and the authorities having jurisdiction covering the work inspected with details of deficiencies discovered.
  .4 Provide the necessary cooperation to ensure that the inspection can proceed.
  .5 The inspection provided in this section does not relieve the Contractor of his responsibility for the performance of the contract. The Contractor is solely responsible for quality control and he shall implement his own supervisory and quality control procedures.
  .6 Materials or workmanship not conforming to the requirements of the contract documents may be rejected at any time during the progress or work.

3.8 Cleaning

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

End of Section

PART 1 GENERAL

1.1 General

.1 Conform to the requirements of Division 1.

1.2 Related Sections

.1 Section 03 30 00 Cast-in-Place Concrete
.2 Section 04 05 19 Masonry Anchorage and Reinforcing
.3 Section 04 22 00 Concrete Unit Masonry
.4 Section 05 12 23 Structural Steel
.5 Section 05 31 00 Steel Deck
.6 Section 05 41 00 Structural Metal Stud Framing
.7 Section 06 10 00 Rough Carpentry
.8 Section 06 20 00 Finish Carpentry
.9 Section 09 21 23 Interior Painting
.10 Section 10 21 13 Compartments and Cubicles

1.3 References

.1 The Ontario Building Code.
  .1 MMAH Supplementary Standard SB-8, September 14, 2012. Design, Construction and Installation of Anchorage Systems for Fixed Access Ladders.
.2 ASTM International, (ASTM)
  .1 ASTM A53/A53M-12 Standard Specification for Pipe, Steel, Black and Hot Dipped, Zinc Coated, Welded and Seamless.
  .2 ASTM A123/A123M-12 Standard Specification for Zinc (Hot Dip Galvanized) Coatings on Iron and Steel Products.
  .3 ASTM A153/A153M-16 Standard Specification for Zinc Coating (Hot-Dip) on Iron and Steel Hardware
  .4 ASTM A307-10 Standard Specification for Carbon Steel Bolts and Studs, 60 000 PSI Tensile Strength.
  .5 ASTM A325 - 04 Standard Specification for Structural Bolts, Steel, Heat Treated, 120/105 ksi Minimum Tensile Strength
  .6 ASTM A385/A385M-15 Standard Practice for Providing High-Quality Zinc Coatings (Hot-Dip)
  .7 ASTM A1008/A1008M-12 Standard Specification for Steel, Sheet, Cold Rolled, Carbon, Structural, High Strength Low Alloy, High Strength Low Alloy with Improved Formability, Solution Hardened, and Bake Hardenable
  .8 ASTM A1011/A1011M-12a Standard Specification for Steel, Sheet and Strip, Hot-Rolled, Carbon, Structural, High-Strength Low-Alloy, High-Strength Low-Alloy with Improved Formability, and Ultra-High Strength
  .9 ASTM C1107/C1107M-17 Standard Specification for Packaged Dry, Hydraulic-Cement Grout (Nonshrink)
  .10 ASTM D1187/D1187M-97(2011)e1 Standard Specification for Asphalt-Base Emulsions for Use as Protective Coatings for Metal
  .11 ASTM D6386-10 Standard Practice for Preparation of Zinc (Hot Dip Galvanized) Coated Iron and Steel Product and Hardware Surfaces for Painting
  .12 ASTM F3125/F3125M-15a Standard Specification for High Strength Structural Bolts, Steel and Alloy Steel, Heat Treated, 120 ksi (830 MPa) and 150 ksi (1040 MPa) Minimum Tensile Strength, Inch and Metric Dimensions

.3 CSA Group (CSA)
.1 CSA G40.20-13/G40.21-13 General Requirements for Rolled or Welded Structural Quality Steel/Structural Quality Steel
.2 CSA G164-18 Hot Dip Galvanizing of Irregularly Shaped Articles.
.3 CSA-S16.1-M Limit States Design of Steel Structures.
.4 CSA S136-12 Cold Formed Steel Structural Members.
.5 CSA W47.1-09 (R2014) Certification of Companies for Fusion Welding of Steel Structures.
.6 CSA W59-18 Welded Steel Construction
.7 CSA W178.1-18 Certification of Welding Inspection Organizations
.8 CSA W178.2-18 Certification of Welding Inspectors
.4 Canadian General Standards Board (CGSB)
.1 CAN/CGSB 1.40-97 Anticorrosive Structural Steel Alkyd Primer
.2 CAN/CGSB 1.181-99 Ready Mixed, Organic Zinc Rich Coating.
.5 Canadian Sheet Steel Building Institute (CSSBI)
.6 Steel Structures Painting Council, Systems and Specifications Manual.
.1 CISC/CPMA 1-73a-1975 A Quick drying One-coat Paint for Use on Structural Steel.
.2 CISC/CPMA 2-75-1975 A Quick Drying Primer for Use on Structural Steel.

1.4 Submittals

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

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

1.5 Qualifications

.1 Work of this Section shall be executed by a firm thoroughly conversant with laws and regulations which govern and capable of workmanship of best grade of modern shop and field practice known to recognized manufacturers specializing in this work and having a minimum ten (10) years proven experience in the fabrication of high quality metal fabrications. Use workmen skilled in work of this Section.

.2 Welding shall be performed by trades persons certified by The Canadian Welding Bureau under CSA Standard W47.1.

1.6 Design Requirements

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

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

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

.4 All access ladders shall be designed to the minimum requirements noted on the drawings and MMAH Supplementary Standard SB-8, whichever is more stringent. This shall include through-bolting anchors at masonry walls.

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

1.7 Examination

.1 All dimensions shall be taken from the drawings and checked against the building. Be responsible for the correctness of such measurements and report to the Consultant in writing all discrepancies between measurements at building and those shown on drawings prior to commencing work. Verify location of anchor bolts and embedded steel and ensure that work prepared by other trades is at a proper elevation, on line, level and true.

1.8 Shipping, Handling and Storage

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

.2 Label, tag or otherwise mark work supplied for installation by other Sections to indicate its function, location and shop drawing description.

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

.4 Protect architecturally exposed materials during fabrication, delivery, handling, storage and erection to prevent marring of surfaces exposed to view, by marking, bending, denting or coarse grinding.

1.9 Waste Management and Disposal

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

PART 2 PRODUCTS

2.1 Materials

.1 Structural Steel Sections and Steel Plate: CSA G40.20-13/G40.21-13, Grade 350W.

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

.3 High Strength Bolts and Nuts: ASTM A325. Dimensions, sizes, thread, strength, quality and type of items shall be designed for the work intended. Exposed fasteners and anchors shall be same material, colour and finish as the metal to which they are applied.

.4 Sheet Steel: (Commercial Quality) ASTM A1008 stretcher leveled or temper rolled.

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

.6 Welding Materials: CSA W59.

.7 Welding Electrodes: CSA W48 Series.

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

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

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

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

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

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

2.2 Finishes

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

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

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

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

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

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

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

PART 3 EXECUTION

3.1 General

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

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

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

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

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

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

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

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

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

.10 Make exposed metal fastenings and accessories of same material, texture, colour and finish as base metal on which they occur unless otherwise shown or specified. Keep exposed fastenings to an absolute minimum evenly spaced and neatly laid out. Make fastenings of permanent type unless otherwise indicated.

.11 Surfaces to be welded shall be free from loose scale, rust, paint, or other foreign matter. Where weld material is deposited in two or more layers, each layer shall be cleaned before the next layer is deposited. Care shall be taken to minimize stresses due to heat expansion, contraction and distortion by using proper sequence in welding and by approved methods.

.12 Appearance, quality of welds made, methods of correcting defective work shall be in accordance with CSA W59.

3.2 Shop Painting

.1 Cleaning Steel:
- .1 Clean steel, whether it is to be painted or not, to the degree required by CISC/CPMA 1-73a, except as specified below.
- .2 Prepare galvanized items scheduled to be painted in accordance with the requirements of Section 09 91 23, and ASTM D6386.
- .3 Steel to receive a shop or field paint finish shall be cleaned in accordance with Sections 09 91 23 or SSPC SP6, whichever produces a surface which has less rust and mill scale.
- .4 Clean steel which is specified to be painted to CISC/CPMA 2-75 in accordance with that Standard.
- .5 Clean steel which is specified to receive an organic zinc-filled epoxy primer, or zinc-rich paint, or inorganic zinc primer, in accordance with SSPC-SP 6, Commercial Blast Cleaning.
- .6 Clean welds by wire brushing and wash down with clean water, to remove the chemical residues left by the electrodes, prior to painting.

.2 The following surfaces shall not be painted:
- .1 Surfaces and edges to be field welded. If painted, remove paint for field welding for a distance of at least 50 mm on all sides of the joint, to ensure proper fusion of the metal.
- .2 The contact surfaces of friction type connections assembled by high strength bolts.
- .3 Portions of steel members which are to be encased in or in contact with concrete or masonry.
- .4 Galvanized items not specifically indicated to be painted.

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

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

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

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

3.3 Galvanizing

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

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

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

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

.5 Coating Requirements:
.1 Weight: the weight of the galvanized coating shall conform to Table 1 of CAN/CSA G164, ASTM A123 or ASTM A153 (as appropriate).
.2 Surface Finish: The galvanized coating shall be continuous, adherent, as smooth and evenly distributed as possible and free from any defect that is detrimental to the stated end use of the coated article. The integrity of the coating shall be determined by visual inspection and coating thickness measurements.
.3 Adhesion: the galvanized coating shall be sufficiently adherent to withstand normal handling.

3.4 Bollards

.1 Steel pipe bollards schedule 40 standard weight, steel pipe of size shown, complete with anchors and sleeves, install plumb and free of defects detrimental to appearance and performance. Bollards shall be one piece construction no welds allowed.

.2 Concrete supplied and installed under the works of Section 03 30 00.

.3 Finish: prime painted except where cast into concrete.

3.5 Miscellaneous Framing and Supports

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

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

.3 Galvanize miscellaneous framing and supports where indicated.

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

3.6 Angle Lintels

.1 Provide all loose steel angle lintels required to support openings and recesses in masonry walls, whether indicated on the drawings or not. Refer to Architectural, Structural and Mechanical drawings for locations of openings. Lintels shall be as scheduled on the Structural drawings.

.2 Steel angles: CSA G40.21, Grade 300W, sizes indicated for openings. Provide 150 mm minimum bearing at ends unless otherwise indicated.

.3 Weld or bolt back-to-back angles to profiles as indicated.

.4 Supply for installation by Sections 04 22 00 and 04 27 00.

.5 Lintels shall be prime painted unless otherwise indicated.

3.7 Ladders

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

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

.3 Provide elevator pit access ladder to meet requirements of Elevator supplier. Prime paint.

3.8 Vanity Support Brackets

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

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

3.9 Miscellaneous Steel Trim

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

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

.3 Galvanize exterior miscellaneous steel trim.

3.10 Steel Weld Plates and Angles

.1 Provide steel weld plates and angles not specified in other Sections, for items supported from concrete or masonry construction as needed to complete the Work. Provide each unit with no fewer than two integrally welded steel strap anchors for embedding in concrete or masonry.

3.11 Installation

.1 Supervise the setting of bases, anchor bolts, and other steel to concrete connections. Cutting of base plates to accommodate anchor bolts is cause for rejection of base plates.

.2 Provide all bracing and shoring required to support the work of this Section during installation.

.3 Work shall be fabricated and erected square, plumb and true, straight, level and accurately fitted to size detailed on reviewed Shop Drawings. All joints shall be welded unless otherwise indicated. Exposed welds shall be ground smooth and/or flush. Exposed work shall be finished smooth and even, close joints and neat connections. Exposed welds continuous for full length of joints.

.4 Where anchors or fastenings, sleeves, have to be built in by other trades, supply all necessary templates, instructions and supervision to ensure satisfactory installation.

.5 Do all drilling, cutting and fitting necessary to attach this work to adjoining work and make it complete.

.6 Provide all components required for anchoring. Make anchoring in concealed manner where possible. Exposed anchors shall be approved by the Consultant, shall be neat, and of the same material, colour, texture and finish of base metal on which they occur. Exposed fastenings shall be evenly spaced.

.7 Grind all field welds smooth.

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

.9 Touch up galvanized finishes with zinc rich paint.

3.12 Fasteners and Anchors

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

.2 Securely anchor components in place. Unless otherwise indicated, anchor components as follows:
.1 To concrete and solid masonry with expansion or epoxy adhesive type anchors.
.2 To hollow construction with toggle bolts.
.3 To thin metal with screws or bolts.
.4 To thick metal with bolts or by welding.
.5 Fill space between railing members and sleeves with non-shrink grout.

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

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

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

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

3.13 Schedule

.1 General:
- .1 Supply and install all metal fabrications indicated on Drawings, and not included in the work of other Sections.
- .2 Coordinate and sequence the work to ensure timely delivery to the site, of all items to be built in.
- .3 Where items are required to be built into masonry, concrete or other work supply such items to respective Sections with all anchors and accessories for building in.
- .4 All items shall be of sizes and as detailed on drawings.
- .5 Coordinate with Section 09 91 13 and 09 91 23 for preparation of exposed metal items required to have finish coatings applied in the field.
- .6 Review all coordination drawings prior to installation of materials, to ensure that no interferences with the work of other Sections will occur.

3.14 Cleaning

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

.2 Clean after installation exposed prefinished and plated items and items fabricated from stainless steel as recommended by the metal manufacture and protected from damage until completion of the project.

End of Section

PART 1 GENERAL

1.1 General

.1 Conform to the requirements of Division 1.

1.2 Related Sections

.1 Section 03 10 00 Concrete Forming and Accessories
.2 Section 03 30 00 Cast-In-Place Concrete
.3 Section 04 22 00 Concrete Unit Masonry
.4 Section 05 41 00 Structural Metal Stud Framing
.5 Section 05 50 00 Metal Fabrications
.6 Section 06 20 00 Finish Carpentry
.7 Section 07 21 13 Building Insulation
.8 Section 07 26 00 Vapour Retarders
.9 Section 07 52 00 Modified Bituminous Roofing
.10 Section 08 11 00 Metal Doors and Frames

1.3 References

.1 ASTM International (ASTM)
  .1 ASTM A123/A123M-13 Standard Specification for Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products.
  .2 ASTM A653/A653M-15 Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvanealled) by the Hot-Dip Process.
  .3 ASTM F1667 - 17 Standard Specification for Driven Fasteners: Nails, Spikes, and Staples
.2 CSA Group (CSA)
  .1 CAN/CSA A247- M86 (R1996) Insulating Fiberboard.
  .2 CSA B111-1974(R2003) Wire Nails, Spikes and Staples.
  .3 CSA G164-18 Hot Dip Galvanizing of Irregularly Shaped Articles.
  .4 CSA O80 SERIES-15 Wood Preservation
  .5 CSA O86-14 Engineering Design in Wood
  .6 CSA O121-17 Douglas Fir Plywood.
  .7 CSA O141-05 (R2014) Softwood Lumber
  .8 CSA O151-17 Canadian Softwood Plywood
  .9 CSA O437 Series-93 (R2011) Standards on OSB and Waferboard
  .10 CSA Z809-08 Sustainable Forest Management
.3 Canadian General Standards Board (CGSB)
  .1 CAN/CGSB 71.26-M88 Adhesive for Field Glueing Plywood to Lumber Framing for Floor Systems.
.4 Underwriters Laboratories Canada (ULC)
  .1 ULC 102-2018 Standard Method of Test for Surface Burning Characteristics of Building Materials and Assemblies.
.5 National Lumber Grading Authority (NGLA)
  .1 Standard Grading Rules for Canadian Lumber, Latest Edition.
.6 Forest Stewardship Council (FSC)
  .1 FSC-STD-01-001-2004 FSC Principle and Criteria for Forest Stewardship.
  .2 FSC-STD-20-002-2004 Structure and Content of Forest Stewardship Standards V2-1
  .3 FSC Accredited Certified Bodies.

1.4 Submittals

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

.2 When required by authorities having jurisdiction, submit sequential erection drawings indicating all necessary false work, temporary construction bracing and hoisting.

.3 Submit shop drawings for wood trusses stamped and signed by a Professional Engineer registered in the Province of Ontario. Include statement that manufactured wood trusses and beams are designed in accordance with the referenced standards.

1.5 Quality Assurance

.1 Sawn lumber shall be identified by the grade stamp of an association or independent grading agency certified by the Canadian Lumber Standards Accreditation Board.

.2 Design of wood roof structural system including wood trusses and stick framed roof members (rafters, joists, ties etc.) and design of wood stairs shall be in accordance with the Ontario Building Code and CSA 086. Design loads shall be as required by the Ontario Building Code, the National Building Code Supplement and as indicated on the drawings.

.3 Design roof framing connections to resist uplift loads required by the referenced standards

1.1 Shipping, Handling and Storage

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

.2 Store materials to prevent deterioration or the loss or impairment of their structural and other essential properties. Do not store materials in areas subject to high humidity and areas where masonry and concrete work are not completely dried out.

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

PART 2 PRODUCTS

2.1 Materials

.1 Timber Material shall be 'Grade Stamped'.

.2 Construction Lumber: To CAN/CSA O141 Softwood Lumber graded to NLGA Standard Grading Rules for Canadian Lumber, published by the National Lumber Grades Authority. All lumber shall bear grade stamps. Moisture content of softwood lumber not to exceed 19% at time of installation.
- .1 Framing lumber, plates, furring, blocking, No. 1 SPF.
- .2 Nailing strips, furring and strapping: No. 4 S-P-F.
- .3 Fitment framing: No. 1 S-P-F.

.3 Canadian Softwood Plywood: to CSA O151-M, standard construction, good one or both sides as required, thickness as shown or specified.
- .1 Douglas Fir Plywood: To CSA O121-M, standard construction, good one side, thickness as shown on the drawings.
- .2 Plywood used for exposed interior work shall have select grade veneer, one or both faces where exposed, with fire retardant finish. Fire retardant shall be in accordance with CAN/CSA-080.1, and all treated materials shall bear a ULC approval stamp.
- .3 Poplar Plywood: to CSA 0153, standard construction.
- .4 Mat formed structural panel board (oriented strand board): to CAN3-0437.0, square edge, 12.7 mm thickness.

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

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

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

.7 Nailing Discs: flat caps, minimum 25 mm diameter, minimum 0,627 mm thick, sheet metal, formed to prevent dishing.

.8 Sealant: 'Mono' as manufactured by Tremco Manufacturing Ltd. or equivalent by Dow-Corning.

.9 Adhesive: Contractors gun grade cartridge loaded wood adhesive, general purpose, to CSA 0112 Series and CAN/CGSB-71.26.

.10 Vapour Retardant: 0.152 mm polyethylene film to CAN/CGSB 51.34 Type 1.

.11 Fibreglass Insulation: to CSA A101, loose batt type, minimum density of 24 kg/m^3.

.12 Galvanizing: to CAN/CSA-G164. Use galvanized fasteners, and hardware for exterior work, preservative treated lumber, and materials in contact with concrete or masonry.

.13 Fire Retardant Treatment
- .1 Arch Wood Protection, Inc., "Dricon FRT" or equal by Chemical Specialties, Inc., D-Blaze", Hoover Treated Wood Products "Pyro-Guard" or Osmose Wood Preserving Co., Inc. "FirePRO" interior Type A fire-retardant wood treatment.
- .2 Pressure impregnate lumber and plywood with fire-retardant chemicals to comply with AWPA C20 (lumber) and C27 (Plywood), respectively, for treatment type indicated; identify "fire-retardant-treated wood" with appropriate classification marking of Underwriters Laboratories, Inc., or other testing and inspecting agency acceptable to authorities having jurisdiction.
  - .1 Treated materials shall meet FR-S ratings of not more than 25 for flame spread, smoke developed and fuel contributed when tested in accordance with UL 723 or ASTM E84, with no increase in flame spread and evidence of significant progressive combustion upon continuation of test for additional 30 minutes.
  - .2 No increase in above ratings when subjected to standard ASTM D2898 rain test.
  - .3 For interior locations use fire-retardant chemical formulation that produces "Interior Type A" treated lumber and plywood with the following properties under conditions present after installation:
    - .1 No reduction takes place in bending strength, stiffness and fastener holding capacities below values published by manufacturer of chemical formulation that are based on tests by a qualified independent testing laboratory of treated wood products identical to those indicated for this Project under elevated temperature and humidity conditions simulating installed conditions.
    - .2 No other form of degradation occurs due to acid hydrolysis or other causes related to manufacture and treatment.
    - .3 No corrosion of metal fasteners results from their contact with treated wood.
  - .4 Inspect each piece of treated lumber or plywood after drying and discard damaged or defective pieces.
  - .5 Kiln-dry all lumber and plywood materials after treatment to maximum 15% moisture content.

PART 3 EXECUTION

3.1 Installation

.1 Workmanship:
- .1 Execute work using skilled mechanics according to best practice, as specified here.
- .2 Lay out work carefully and to accommodate work of other trades. Accurately cut and fit; erect in proper position true to dimensions; align, level, square, plumb, adequately brace, and secure permanently in place. Join work only over solid backing.

.2 Rough Hardware: Include rough hardware such as nails, bolts, nuts, washers, screws, clips, hangers, connectors, strap iron, and operating hardware for temporary enclosures.

.3 Erection of Framing Members:
- .1 Install members true to line, levels and elevations. Space framing members and frame all openings as detailed on the drawings.
- .2 Construct continuous members from pieces of longest practical length.
- .3 Install spanning members with crown edge up.
- .4 Anchor wood framing to supporting walls with galvanized metal strap ties.

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

.5 Electrical Equipment Backboard: provide backboards for mounting electrical equipment as indicated. Use 19 mm thick fir face veneer fire retardant softwood plywood on 19 mm x 38 mm furring around perimeter and at maximum of 305 mm intermediate spacing.
- .1 Install plywood backboards with countersunk screws.

.6 Blocking: Provide solid wood backing to support equipment and fixtures as required.

.1 Roof Blocking, Curbs and Copings:
- .1 Provide and install framing, blocking, curbs and copings as indicated on the drawings. Anchor blocking securely in permanent manner.
- .2 Provide minimum 10 mm Douglas Fir plywood copings on all built-up wood copings and curbs as detailed.
- .3 All wood curbs shall be filled with fibrous insulation specified in Section 07 21 13.
- .4 Provide shims and blocking necessary for levelling of roof hatches and equipment curbs.

3.2 Cleaning

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

End of Section

PART 1 GENERAL

1.1 General

.1 Conform to the requirements of Division 1.

1.2 Related Sections

.1 Section 05 50 00 Metal Fabrications
.2 Section 06 10 00 Rough Carpentry
.3 Section 06 40 00 Architectural Woodwork
.4 Section 07 92 00 Joint Sealants
.5 Section 08 11 00 Metal Doors and Frames
.6 Section 08 14 16 Flush Wood Doors
.7 Section 08 71 10 Door Hardware
.8 Section 09 21 16 Gypsum Board
.9 Section 09 91 23 Interior Painting
.10 Section 10 28 10 Toilet and Bath Accessories.

1.3 References

.1 ASTM International (ASTM)
  .1 ASTM E1333-14 Standard Test Method for Determining Formaldehyde Concentrations in Air and Emissions Rates from Wood Products Using a Large Chamber.
  .2 ASTM F1667-18a Standard Specification for Driven Fasteners: Nails, Spikes, and Staples
.2 American National Standards Institute (ANSI)
  .1 ANSI A208.1-2009 Particleboard.
  .2 ANSI A208.2-2016 Medium Density Fibreboard (MDF) for Interior Applications.
  .3 ANSI/HPVA HP-1-2016, Standard for Hardwood and Decorative Plywood.
  .4 ANSI/NEMA LD 3-2005 High Pressure Decorative Laminates
.3 Architectural Woodwork Manufacturers Association of Canada (AWMAC) and Architectural Woodwork Institute (AWI)
  .1 Architectural Woodwork Quality Standards Illustrated.
.4 Canadian Plywood Association (CanPly)
  .1 The Plywood Handbook 2005.
.5 CSA Group (CSA)
  .1 CSA B111-1974 (R2003) Wire Nails, Spikes and Staples.
  .2 CSA G164-18 Hot Dip Galvanizing of Irregularly Shaped Articles.
  .3 CSA O112 SERIES-M1977 (R2006) Standards for Wood Adhesives
  .4 CSA O121-17 Douglas Fir Plywood.
  .5 CSA O141-05 (R2014) Softwood Lumber
  .6 CSA O151-17 Canadian Softwood Plywood
  .7 CSA O153-13 (R2017) Poplar Plywood.
  .8 CSA Z760-94 (R2001) Life Cycle Assessment
.6 Forest Stewardship Council (FSC)
  .1 FSC-STD-01-001-V4-0 FSC Principle and Criteria for Forest Stewardship.
  .2 FSC-STD-20-002-2004, Structure and Content of Forest Stewardship Standards V2-1
  .3 FSC Accredited Certified Bodies.
.7 National Hardwood Lumber Association (NHLA)
  .1 Rules for the Measurement and Inspection of Hardwood and Cypress 1998.
.8 National Lumber Grades Authority (NLGA)
  .1 Standard Grading Rules for Canadian Lumber 2005.

.9 South Coast Air Quality Management District (SCAQMD), California State (SCAQMD)
.1 SCAQMD Rule 1168-03, Adhesives and Sealants Applications

1.4 Submittals

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

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

.3 Submit duplicate 300 mm long samples of each type of solid wood or 300 x 300 mm square type of plywood to receive stain or natural finish.

.4 Submit samples of plastic laminate materials.

1.5 Quality Assurance

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

.2 Plywood, particleboard, OSB and wood based composite panels in accordance with CSA and ANSI standards.

.3 Wood materials certified by Forestry Stewardship Council.

1.6 Shipping, Handling and Storage

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

.2 Protect materials against dampness during and after delivery.

.3 Store materials in ventilated areas, protected from extreme changes of temperature or humidity.

1.7 Waste Management and Disposal

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

PART 2 PRODUCTS

2.1 Lumber Materials

.1 Softwood lumber: unless specified otherwise, S4S, moisture content 19% or less in accordance with following standards:
.1 CSA O141.
.2 NLGA Standard Grading Rules for Canadian Lumber.
.3 AWMAC custom premium grade, moisture content as specified.
.4 Machine stress-rated lumber is acceptable.

.2 Hardwood Lumber: To NHLA requirements, moisture content of 6% maximum, maple species, AWMA Custom Grade.
.1 Bench Slats: Select Grade Maple.

2.2 Panel Materials

.1 Douglas Fir Plywood (DFP): to CSA O121, standard construction.
.1 Forestry Stewardship Council (FSC) certified.
.2 Urea-formaldehyde free.

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

.3 Hardwood Veneered Plywood: To CSA O115, of thickness indicated, Type II Select Grade Maple, where transparent finish is required and Solid Grade where paint finish is required. Good two sides for work with two sides exposed to view; good one side for work with one side exposed to view. Use particle board core with Type I bond.

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

.5 Medium density fibreboard (MDF): to ANSI A208.2, density 640-800 kg/m³.
.1 Forestry Stewardship Council (FSC) certified.
.2 Urea-formaldehyde free.

2.3 Plastic Laminate

.1 Plastic laminate facing sheet: ANSI/NEMA LD 3-2005 High-Pressure Decorative Laminates (HPDL) PF-S and GP-S;
.1 Backing sheet: BK Grade by manufacturer of facing sheet.
.2 Core: CSA O151
.3 Laminating adhesive: CSA O112.
.4 Core sealer: clear water resistant synthetic resin sealer.
.5 Colours, pattern, gloss and texture will be selected by Consultant from full range of products by one of the following:
.1 Formica,
.2 Arborite,
.3 Pionite,
.4 Nevamar
.5 Wilsonart.
.6 Up to three (3) colours and patterns will be selected by the Consultant.

2.4 Accessories

.1 Rough Hardware: Bolts, lag screws, anchors, nails and expansion shields required to secure this portion of work. Rough hardware hot dip galvanized conforming to latest edition of CSA G164. All fasteners used in damp or wet areas to be suitable for use in corrosive environment. Use hot dipped galvanized or other material approved by the Consultant.

.2 Nails and staples: to ASTM F1667 galvanized.

.3 Wood screws: to CSA B35.4 plain type and size to suit application.

.4 Stainless Steel hardware: Type 316 Stainless steel for exposed or wet locations, tamper proof.

.5 Splines: wood or metal to suit application.

.6 Adhesive: recommended by manufacturer, waterproof type, maximum VOC limit 30 g/L SCAQMD Rule 1168 - Adhesives and Sealants Applications.

.7 Salon Hardware Accessories; provide 1- 3-1/2” diameter Blow Dryer Ring (Grommet) and 2-2” diameter accessory rings per station as noted on plans and details.

PART 3 EXECUTION

3.1 Construction

.1 Fastening:
- .1 Position items of finished carpentry work accurately, level, plumb, true and fasten or anchor securely.
- .2 Design and select fasteners to suit size and nature of components being joined. Use proprietary devices as recommended by manufacturer.
- .3 Set finishing nails to receive filler. Where screws are used to secure members, countersink screw in round smooth cut hole and plug with wood plug to match material being secured.
- .4 Replace items of finish carpentry with damage to wood surfaces including hammer and other bruises.

.2 Interior and exterior frames:
- .1 Set frames with plumb sides, level heads and sills, and secure.

3.2 Fabrication

.1 General:
- .1 Field measure all dimensions.
- .2 Fabricate all finish carpentry items to AWMAC premium grade, and in accordance with the reviewed shop drawings.
- .3 Set nails and screws, apply stained plain wood filler to indentations, sand smooth and leave ready to receive finish.
- .4 Provide 10 mm thick solid matching wood strip on plywood and particle board edges 13 mm or thicker, exposed in final assembly.
- .5 Ease edges of solid lumber components to 1.6 mm radius.

.2 Plastic Laminate Components
- .1 Fabricate plastic laminate window stools as detailed. Stools shall be minimum 19 mm thick plastic laminate plywood, with edge banding on all exposed faces. Fabricate in one piece, without joins, wherever as possible. Where necessary, joins shall be centred on window mullions and tightly butted together with concealed splines.
- .2 Fabricate vanities and change room shelving units as detailed.
- .3 Unless otherwise specified herein, comply with requirements of ANSI/NEMA LD 3 Annex 'A'.
- .4 Assembly: Bond plastic laminate to core with adhesive, under pressure.
- .5 Core: unless otherwise indicated: 19 mm thick.
- .6 Balanced construction: plastic laminate covered components shall be of balanced construction, with plastic laminate on both faces of core. Seal core edges not covered with plastic laminate.
- .7 Use largest practicable plastic laminate sheet size.
- .8 Provide joints symmetrically; provide joints as corners and at changes in superficial areas; provide concealed draw bolt anchors and joints. All butt joints shall have a blind spine.
- .9 Openings and cutouts:
  - .1 Radius internal corners at least 3 mm and chamfer edges.
  - .2 Where core edge is to remain exposed, cover with plastic laminate edging.

.3 Where core edge is to be concealed, seal with sealer.

3.3 Installation

.1 Do finish carpentry to Quality Standards of the Architectural Woodwork Manufacturers Association of Canada (AWMAC), except where specified otherwise.

.2 All fastenings shall be concealed.

.3 Provide heavy duty grounds as necessary for secure installation of finish carpentry work.

.4 All wood surfaces shall be sanded smooth, ready to receive finish.

.5 Scribe and cut as required, fit to abutting walls and surfaces, fit properly into recesses and to accommodate piping, columns, fixtures, outlets or other projecting, intersecting or penetrating objects.

.6 Form joints to conceal shrinkage.

.7 Set and secure materials and components in place, rigid plumb and square.

.8 Design and select fasteners to suit size and nature of components being joined. Use proprietary devices as recommended by manufacturer.

.9 Set finishing nails to receive filler. Where screws are used to secure members, countersink screws in round, cleanly cut hole and plug with wood plug to match material being secured.

.10 Replace items of finish carpentry with damage to wood surfaces including hammer and other bruises.

.11 Install window stools with wood levelling shims, after installation of windows and interior finishing is complete. Screw levelling shims to metal stud framing with self-tapping sheet metal screws. Bond stools to shims with waterproof adhesive. Tightly butt all joints and bond together with adhesive and concealed splines. Cut to fit tight to all penetrations.

.12 Apply mildew resistant sealant to perimeter of all vanity tops and window stools as specified in Section 07 92 00.

3.4 Door Installation

.1 Install doors in accordance with instructions in Section 08 11 00 and Section 08 14 16 and manufacturer’s printed instructions.

3.5 Finish Hardware Installation

.1 Finish hardware will be supplied for installation under this Section.

.2 Prepare doors and frames in accordance with manufacturer’s instructions and templates. Install finish hardware complete in all respects, hang doors and make adjustments necessary.

.3 Doors shall swing freely. Where thresholds are to be used, door bottom shall be finished to suit thresholds as required.

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

3.6 Miscellaneous

.1 Install Toilet and Bath Accessories as specified in Section 10 28 10, including accessories supplied by Owner.

3.7 Cleaning

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

End of Section

PART 1 GENERAL

1.1 General

.1 Conform to the requirements of Division 1.

1.2 Related Sections

.1 Section 05 50 00 Metal Fabrications
.2 Section 06 10 00 Rough Carpentry
.3 Section 06 20 00 Finish Carpentry
.4 Section 07 92 00 Joint Sealants
.5 Section 08 80 05 Glazing
.6 Section 09 21 16 Gypsum Board
.7 Section 09 91 23 Interior Painting

1.3 References

.1 ASTM International (ASTM)
  .1 ASTM F1667 - 17 Standard Specification for Driven Fasteners: Nails, Spikes, and Staples
.2 Architectural Woodwork Manufacturer's Association of Canada (AWMAC)
  .1 Architectural Woodwork Standards Manual.
.3 American National Standards Institute (ANSI)
  .1 ANSI A208.1-2009 Particleboard
  .2 ANSI/NPA A208.2-2009 Medium Density Fibreboard (MDF)
  .3 ANSI/NEMA LD 3-2005 High-Pressure Decorative Laminates (HPDL)
  .4 ANSI/HPVA HP-1-2009 Standard for Hardwood and Decorative Plywood
.4 CSA Group (CSA)
  .1 CSA O112 SERIES-M1977 (R2006) Wood Adhesives
  .2 CSA O121-08 (R2013) Douglas Fir Plywood
  .3 CSA O151-17 Canadian Softwood Plywood
  .4 CSA O153-13 Poplar Plywood
.5 Canadian General Services Board (CGSB)
  .1 CAN/CGSB-11.3-M, Hardboard

1.4 Submittals

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

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

.3 Samples:
  .1 Submit duplicate, 300 mm long samples of each type of solid wood and 300 x 300 mm samples of each type of plywood used in exposed work and scheduled to receive stained or natural finish, complete with specified finish, prior to fabrication of cabinetwork.
  .2 Veneer samples minimum 304 mm x 304 mm. Each sample set of three to represent range of colour and grain expected.
  .3 Submit full range of manufacturer's standard plastic laminates for selection by the Consultant.
  .4 Submit sample of each type of cabinet hardware component used.

1.5 Quality Control

.1 Mock-up: Prepare mock-ups in accordance with Section 01 45 00 – Quality Control.

.2 Provide mockups of one base cabinet, one wall hung cabinet, and one countertop. Base cabinet to have minimum one drawer. Mockup of material and finish to be provided. Approved mockup may be incorporated in the project.

1.6 Quality Assurance

.1 Unless otherwise specified, carry out finish carpentry work in accordance with the requirements of "Millwork Standards" (latest issue) of Architectural Woodwork Manufacturers' Association of Canada (AWMAC), Custom Grade.

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

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

1.7 Definition

.1 "Exposed" when referred to in this Section, shall mean all parts which can be viewed and shall include interiors of cabinets, backs of doors, shelving and gables.

1.8 Shipping, Handling and Storage

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

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

.3 Protect against damage, including damage by excessive changes in moisture content, during delivery and storage. Maintain minimum storage temperature of 16 ° C, and relative humidity of 25% to 55%.

.4 Cover plastic laminate faces at shop with heavy Kraft paper.

.5 Do not deliver finish carpentry components to site before all wet trades are completed, the building is closed in and humidity conditions on site are acceptable. Do not deliver during rain or damp weather

.6 Store materials on site in such a way as to prevent deterioration or loss or impairment of essential properties. Prevent excessive moisture gain of materials.

1.9 Protection

.1 Provide coverings as necessary to protect finish carpentry components from damage of any kind during storage and after installation.

1.10 Waste Management and Disposal

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

1.11 Warranty

.1 Warrant the work of this Section against defects of workmanship and material, for a period of two years from the date of Substantial Performance and agree to make good promptly any defects which occur or become apparent within the warranty period.

PART 2 PRODUCTS

2.1 Materials

.1 Solid Wood:
  .1 Unless otherwise indicated, provide AWMAC Custom Grade.
  .2 All wood materials shall be new, straight and clean, free of sap, knots, pitch, and other defects, except as permitted by applicable grading rules.
  .3 All wood shall be kiln dried to a maximum moisture content of 7%.
  .4 Softwood: to CSA O141, dressed all sides used in concealed locations.

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

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

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

.5 MDF: Medium Density Fiberboard meeting requirements of AWMAC’s STANDARDS (NAAWS).

.6 Edgeband
  .1 For wood veneer casework: Veneer of same species and cut as exposed surfaces.
  .2 For Plastic Laminate Casework: [PVC] [High Pressure Decorative Laminate (HPDL)].

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

.8 Plastic laminate facing sheet: ANSI/NEMA LD 3 High-Pressure Decorative Laminates (HPDL) PF-S and GP-S;
  .1 Backing sheet: BK Grade by manufacturer of facing sheet.

.2 Core: CAN3-0188.1M, Grade R.
.3 Laminating adhesive: CAN3-O112 Series M.
.4 Core sealer: clear water resistant synthetic resin sealer.
.5 Colours, pattern, gloss and texture will be selected by Consultant from full range of products by one of the following:
  .1 Formica,
  .2 Arborite,
  .3 Pionite,
  .4 Nevamar
  .5 Wilsonart.
.6 Up to three (3) colours and patterns will be selected by the Consultant.

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

.10 Fasteners and Adhesive:
  .1 Nails and staples: ASTM F1667, galvanized, spiral head nails.
  .2 Screws: Zinc, cadmium or chrome plated steel.
  .3 Splines: wood or metal, to suit application.
  .4 Adhesive: Type 1 waterproof. To CSA O112-M, type as appropriate for the intended application. Complying with ANSI/WDMA I.S-1 series. Contact bond not acceptable.
  .5 Avoid the use of adhesives, preservatives, synthesizing agents and finish coatings that contain formaldehyde and high V.O.C. content.

.11 Cabinet Hardware: Products listed are a standard of acceptance. Products by other manufacturers, of equal quality and similar appearance may also be accepted subject to review and approval by Consultant.
  .1 Shelf Standards: Knape & Vogt KV80, Anochrome finish.
  .2 Brackets: Knape & Vogt KV180, Anochrome finish.
  .3 Hinges: Blum concealed hinges, 125° clip and 125° opening with self-closing spring. Full or half overlay. Nickel plated steel.
  .4 Cabinet Pulls: Richelieu D-Pull No: 30134-170, 96 mm c.c. brushed stainless steel.
  .5 Cabinet Locks: CCL 0737 pin tumbler MK & KA by room.
  .6 Catches: Type optional with manufacturer.
  .7 Drawer Slides: Knape & Vogt 8450FM Soft-Close Full-Extension Drawer Slide
  .8 Door and Drawer Bumpers: “Quietex” bumpers.
  .9 Provide other hardware and hardware accessories as detailed or required.
  .10 All exposed hardware to have Platinum (Mica) finish by Teknion or equivalent unless noted otherwise.
  .11 For Teachers cabinets, refer to Section 08 71 00, Door Hardware.
  .12 Salon Hardware Accessories; provide 1- 3-1/2” diameter Blow Dryer Ring (Grommet) and 2-2” diameter accessory rings per station as noted on plans and details.
  .13 Display Case Sliding Glass Hardware: Knape and Vogt Canada Ltd. Roll-Ezy ball bearing aluminum track assembly #P992 and #962KA-440-CH adjustable lock with satin nickel finish, complete with duplicate keys.
  .14 Provide other hardware and hardware accessories as detailed or required.
  .15 Pilaster Strips: Knape & Vogt KV225, Zinc Plated

.16 Brackets: Knape & Vogt KV239, zinc plated.

2.1 Fabrication

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

.2 Wood Casework: AWMAC Standard Custom Grade.

.3 Construction Type: Frameless

.4 Cabinet and door interface: Flush overlay.

.5 Exposed joints and edges:
  .1 Uniformly space exposed joints unless otherwise indicated.
  .2 No edge grain shall be visible; mitre external corners, house internal fasteners. Glue mitred corners.
  .3 All exposed edges of plywood and particle board shall have solid wood edging, pressure glued. AWMAC No. 3 edge.
  .4 Ease edges of solid lumber components to 1.6 mm radius.

.6 Mechanical Fasteners:
  .1 Inconspicuously locate mechanical fasteners. Wherever possible, conceal fastenings.
  .2 Countersink nail heads.
  .3 Where exposed to view, countersink screw and bolt heads and fill holes with matching wood plugs.
  .4 Cutting and fitting: make cut-outs in work of this Section as required to accommodate work of other Sections.
  .5 Make provisions in cabinetwork to accept built-in appliances, provided by others.

2.2 Wood Casework

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

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

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

.4 Exposed Surfaces: Maple, flat cut, book matched] [material suitable for clear finish meeting requirements of AWMAC's STANDARDS (NAAWS) for Grade specified.

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

.6 Semi-exposed surfaces: low pressure melamine overlay.

.7 Doors for “Teachers Cabinet” specified under Section 08 14 16, Flush Wood Doors. Doors shall match cabinet species, cut and finish.

2.3 Plastic Laminate Casework

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

.2 Tenon, dado, dowel, or rabbet interior construction with all parts well glued. Shoulder mitre all exposed corners. Open ends or skeleton frames against walls are not permitted. Unless otherwise permitted by Consultant, use unitized construction system for all components.

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

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

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

.6 Semi-exposed surfaces: LPDL

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

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

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

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

.11 Install cabinet hardware in accord with hardware manufacturer's directions. Unless otherwise indicated, provide each door with pull and with minimum two hinges. Provide locks where indicated.

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

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

2.4 Drawers

.1 Sides: Particle board with melamine surfaces.

.2 Bottoms: MDF or hardboard with melamine surfaces

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

2.5 Laminated Plastic Countertops

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

.2 Use largest practicable plastic laminate sheet size.

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

.4 Front edges: As indicated

.5 Provide joints symmetrically; provide joints as corners and at changes in superficial areas; provide concealed draw bolt anchors and joints. All butt joints shall have a blind spine.

2.6 Finishes

.1 All exposed exterior surfaces: plastic laminate as indicated. Colours selected by the Consultant.

.2 Wood Finish: 3 coats clear polyurethane finish on all sides as specified in Section 09 91 23. Factory finish wherever practical.

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

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

.5 Apply finishes in accordance with the AWMAC Manual.

.6 Stainless Steel: Type 316 stainless steel, brushed finish.

PART 3 EXECUTION

3.1 Examination

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

.2 Verify HVAC controls and systems are operating properly.

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

3.2 Installation

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

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

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

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

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

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

.7 Install plastic laminate components using concealed fastening devices.

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

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

.7 Cut equipment cutouts shown on plans using templates provided.
  .1 Radius internal corners at least 3 mm and chamfer edges.
  .2 Where core edge is to remain exposed, cover with plastic laminate edging.
  .3 Where core edge is to be concealed, seal with sealer.

.10 Where access is required to valves and other mechanical and electrical components, located behind cabinetwork, provide removable plywood access panels of size required and secure with four brass screws.

.11 Provide for wiring and cable management systems wiring grommets as indicated on the drawings.

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

3.3 Adjustment

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

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

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

3.4 Cleaning

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

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

End of Section

PART 1 GENERAL

1.1 General

.1 Conform to the requirements of Division 1.

1.2 Related Sections

.1 Section 04 21 13 Brick Masonry
.2 Section 06 10 00 Rough Carpentry
.3 Section 07 52 00 Modified Bituminous Roofing
.4 Section 07 71 00 Roof Specialties and Accessories
.5 Section 07 92 00 Joint Sealants

1.3 References

.1 ASTM International (ASTM)
  .1 ASTM A653/A653M-18 Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process
  .2 ASTM D523-14 (2018) Standard Test Method for Specular Gloss
.2 CSA Group (CSA)
  .1 CSA B111 Wire Nails, Spikes and Staples.
  .2 CSA 136-16 North American Specification for the Design of Cold-Formed Steel Structural Members
.3 Canadian General Services Board (CGSB)
  .1 CAN/CGSB 1.108-M Bituminous Solvent Type Paint.
  .2 CAN/CGSB-37.5 Cutback Asphalt Plastic Cement.
  .3 CAN/CGSB-51.32 Sheathing, Membrane, Breather Type.
.4 Canadian Sheet Steel Building Institute (CSSBI)
  .1 CSSBI - Standard Practice for Sheet Steel Cladding.
  .2 CSSBI 20M-91 Sheet Steel Cladding for Architectural and Industrial Applications.
  .3 CSSBI B16-94 Prefinished Sheet Steel for Building Construction.
.5 Canadian Roofing Contractors Association (CRCA) Roofing Specifications Manual.

1.4 Submittals

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

.2 Submit duplicate 300 x 300 mm samples of each type of sheet metal material, colour and finish when requested by the Consultant.

1.5 Design and Performance Requirements

.1 Appearance: neatly and evenly lay out and install components. Exposed fastening devices not permitted.

.2 Effects of Wind: resist positive and negative wind pressures without detrimental effects.

.3 Water Control: prevent passage of water.

.4 Thermal Movement: accommodate expansion and contraction of component parts without buckling, failure of joints, undue stress on fasteners and other detrimental effects.

.5 Compatibility: components shall be compatible with dissimilar metals and materials with which they are in contact or fastened to so as to prevent corrosion, staining and other detrimental effects. If required, treat or separate contact surfaces with inert and non-staining insulation material to achieve compatibility.

1.6 Quality Assurance

.1 Work of this Section shall be performed by a qualified sheet metal contractor with a minimum of 5 years of experience in the type of work required and specified. Submit proof of experience where requested by the Consultant.

1.7 Shipping, Handling and Storage

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

.2 Materials shall be handled and stored on the job in such a manner that no damage shall be done to the material or the structures.

.3 Materials showing evidence of improper handling and storage shall be rejected and removed from the site at no additional expense to the Owner.

1.8 Waste Management and Disposal

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

1.9 Warranty

.1 Warrant the work of this Section against defects of workmanship and material, for a period of five years from the date of Substantial Performance and agree to make good promptly any defects which occur or become apparent within the warranty period.

.2 Submit manufacturer’s warrantee that pre-finished materials will not lose film integrity for 25 years and will not chalk or fade for 20 years following date of Substantial Performance.

PART 2 PRODUCTS

2.1 General

.1 Ensure compatibility of all materials in contact with roof membrane.

2.2 Materials

.1 Sheet Metal: 0.48 mm thick galvanized sheet steel, commercial quality to ASTM A653 Grade 'A' with a minimum yield stress of 230 MPA, and a working stress of 144 MPA, to CSA S136. Material shall have Z275 designation zinc coating.

.2 Prefinished material shall be colour coated with manufacturer’s standard finish system equivalent to Valspar WeatherXL coating system, utilizing silicone modified polyester resin, minimum dry film thickness of 1.0 ± 0.1 mils when tested to ASTM D1005. This Section shall supply all metal flashing for all roof and wall applications whether shown or not, and as necessary for the complete installation.

.1 Colour for all sheet metal flashing and trim shall be as selected by the Consultant from full range of manufacturer’s standard colours.

.2 Up to three colours may be selected.

.3 Continuous hook on strips and metal bellows: 0.65 mm galvanized sheet steel, zinc coating designation ZF275.

.4 Isolation Coating: Alkali resistant exterior bituminous paint to CAN/CGSB 1.108-M.

.5 Plastic Cement: To CAN/CGSB 37.5.

.6 Nails, Bolts, Screws and Other Fastenings: same metal finish as sheet metal being used to CSA B111. The size of fastenings shall suit the applicable conditions.

.7 Underlay: No. 15 perforated asphalt felt to CSA A123.3-M or dry sheathing, breather type, to CAN/CGSB-51.32

.8 Cleats: Of same material, and temper as sheet metal, minimum 50 mm wide. Thickness same as sheet metal being secured.

PART 3 EXECUTION

3.1 General

.1 Install sheet metal work in accordance with CRCA specifications and as detailed.

.2 Use concealed fastenings except where approved before installation.

3.2 Fabrication

.1 Fabricate metal flashings and other sheet metal work in accordance with applicable CRCA specifications and as indicated.

.2 Form pieces in 2440 mm maximum lengths.

.3 Hem exposed edges on underside 13 mm. Mitre and seal corners with sealant.

.4 Form sections square, true and accurate to size, free from distortion and other defects detrimental to appearance or performance.

.5 Apply isolation coating (two coats) to metal surfaces to be in contact with concrete or mortar or dissimilar metals.

.6 Install underlay under sheet metal in accordance with CRCA "FL" series details. Lap joints 100 mm.

.7 All seams shall be of the "slip lock type" that permit adequate movement without resulting in deformation or loosening of metal flashings. Lapped joints or exposed raw edges will not be accepted. Exposed edges shall be "double back" at least 13 mm. At eaves and parapets, metal shall be hooked over continuous starter strips minimum 1 gauge thicker than the metal used for flashing. Secure starter strips at 300 mm on centre or closer as required.

.8 Where metal terminates under fascia boards, secure metal at 610 mm centres using specified fasteners. At curbs to openings or at sleepers, provide locked or standing seams at corners. Solder mitred corners, pop rivet or form standing seams.

.9 Secure metal flashings in reglets at 610 mm centres and further secure metal to vertical surfaces at locks as required.

.10 All flashings shall be installed in straight lines. Irregular or badly fitted work will not be accepted. Exposed fastenings will only be permitted where concealed fastening is not possible. Provide neoprene washers for exposed fasteners.

.11 Imperfections in metal flashing work such as holes, dents, creases, or oil-canning will not be accepted.

.12 Fabricate and install scuppers as detailed and in accordance with CRCA specifications and standards.

3.3 Caulking of Flashings

.1 Sealants shall be as specified in Section 07 92 00 - Joint Sealants.

.2 Caulk all joints in flashing.

.3 Dissimilar metals in contact, or metals in contact with adjacent surfaces shall be separated from one another to prevent corrosion, staining, or electrolysis by use of approved methods and materials.

.4 Do caulking between metal flashing and concrete.

.5 Caulking compound shall be applied in strict accordance with the manufacturer's application instructions. Use proper surface primers where necessary.

.6 Colour of caulking compound shall be the integral colour of the abutting material.

3.4 Cleaning

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

End of Section

PART 1 GENERAL

1.1 General

.1 Conform to the requirements of Division 1.

1.2 Related Sections

.1 Section 04 22 00 Concrete Unit Masonry
.2 Section 05 31 00 Steel Deck
.3 Section 07 92 00 Joint Sealants
.4 Section 09 21 16 Gypsum Board

1.3 References

.1 ASTM International (ASTM)
  .1 ASTM E84-18 Standard Test Method for Surface Burning Characteristics of Building Materials
  .2 ASTM E119-18 Standard Test Methods for Fire Tests of Building Construction and Materials
  .3 ASTM E136-16a Standard Test Method for Behavior of Material in a Vertical Tube Furnace at 750° C
  .4 ASTM E814-13a (2017) Standard Test Method for Fire Tests of Penetration Firestop Systems.
  .5 ASTM E1966-15 Standard Test Method for Fire-Resistive Joint Systems
  .6 ASTM E2307-15be1 Standard Test Method for Determining Fire Resistance of Perimeter Fire Barriers Using Intermediate-Scale, Multi-story Test Apparatus
.2 Underwriter's Laboratories of Canada (ULC)
  .1 ULC 101-2014 Standard Methods of Fire Endurance Tests of Building Construction and Materials
  .2 ULC 102.2-2018 Method of Test for Surface Burning Characteristics of Flooring, Floor Coverings, and Miscellaneous Materials and Assemblies
  .3 ULC 115-2018 Standard Method of Fire Tests of Firestop Systems
.3 National Fire Protection Association (NFPA)
  .1 NFPA 252 Standard Methods of Fire Test and Door Assemblies
.4 South Coast Air Quality Management District (SCAQMD) California State
  .1 SCAQMD Rule 1168-03: Adhesives and Sealants.
.5 Ontario Building Code

1.4 Submittals

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

.2 Product Data: Submit manufacturer's printed product literature, specifications and datasheet and include product characteristics, performance criteria, physical size, finish and limitations.

.3 Shop Drawings: Submit shop drawings to show location, proposed material, reinforcement, anchorage, fastenings and method of installation. Construction details should accurately reflect actual job conditions.

.4 Samples: Submit duplicate 300 x 300 mm samples showing actual fire stop material proposed for project.

.5 Quality Assurance Submittals: submit following in accordance with Section 01 45 00 - Quality Control.

.1 Test reports: in accordance with ULC 101 for fire endurance and ULC 102 for surface burning characteristics.
.2 Submit certified test reports from approved independent testing laboratories, indicating compliance of applied fire stopping with specifications for specified performance characteristics and physical properties
.3 Certificates: submit certificates signed by manufacturer certifying that materials comply with specified performance characteristics and physical properties.
.4 Manufacturer's Instructions: submit manufacturer's installation instructions and special handling criteria, installation sequence, cleaning procedures.

1.5 Definitions

.1 Fire Stop Material: device intended to close off opening or penetration during fire or materials that fill openings in wall or floor assembly where penetration is by cables, cable trays, conduits, ducts and pipes and poke-through termination devices, including electrical outlet boxes along with their means of support through wall or floor openings.

.2 Single Component Fire Stop System: fire stop material that has Listed Systems Design and is used individually without use of high temperature insulation or other materials to create fire stop system.

.3 Multiple Component Fire Stop System: exact group of fire stop materials that are identified within Listed Systems Design to create on site fire stop system.

1.6 Quality Assurance

.1 One installer shall install all firestopping on the project. Each trade shall not firestop their own service penetrations. Installer shall be certified by fire stopping manufacturer.

.2 Qualifications:
.1 Qualified Installer: specializing in fire stopping installations with 5 years documented experience approved and trained by manufacturer.

.3 Pre-Installation Meetings: convene pre-installation meeting one week prior to beginning work of this Section, with contractor's representative and Consultant to:
.1 Verify project requirements.
.2 Review installation and substrate conditions.
.3 Co-ordination with other building subtrades.
.4 Review manufacturer's installation instructions and warranty requirements.

.4 Site Meetings:
.1 As part of Manufacturer's Services described in 3.5- Field Quality Control, schedule site visits, to review Work, at stages listed.
.2 After delivery and storage of products, and when preparatory Work is complete, but before installation begins.
.3 Twice during progress of Work at 25% and 60% complete.
.4 Upon completion of Work, after cleaning is carried out.
.5 Single Source Responsibility: Obtain through-penetration fire-stop systems for each kind of penetration and construction condition indicated from a single manufacturer.

.5 Field-Constructed Mockup: Prior to installing fire-stopping, erect mockups for each different through-penetration fire-stop system indicated to verify selections made and to demonstrate qualities of materials and execution. Build mockups to comply with the following requirements, using materials indicated for final installations.

.1 Locate mockups on site in locations indicated or, if not indicated, as directed by Consultant.
.2 Notify Consultant one (1) week in advance of the dates and times when mockups will be erected.
.3 Obtain Consultant's acceptance of mockups before start of final unit of Work.
.4 Retain and maintain mockups during construction in an undisturbed condition as a standard for judging completed unit of Work.
.5 Accepted mockups in an undisturbed condition at time of Substantial Performance may become part of completed unit of Work.

1.7 Sustainable Requirements

.1 Materials shall be Low VOC type conforming to SCAQMD Rule 1168-03. Maximum VOC level of firestopping materials shall be 250 g/l.

1.8 Project Conditions

.1 Environmental Conditions: Do not install fire-stopping when ambient or substrate temperatures are outside limits permitted by fire-stopping manufacturers or when substrates are wet due to rain, frost, condensation, or other causes.

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

1.9 Shipping, Handling and Storage

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

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

.3 Deliver materials to the site in undamaged condition and in original unopened containers, marked to indicate brand name, manufacturer, ULC markings.

.4 Storage and Protection:
.1 Store materials indoors in dry location and in accordance with manufacturer's recommendations in clean, dry, well-ventilated area.
.2 Replace defective or damaged materials with new.

1.10 Waste Management and Disposal

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

PART 2 PRODUCTS

2.1 Materials

.1 All fire stopping shall consist of ULC listed firestop system.

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

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

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

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

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

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

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

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

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

.11 Water (if applicable): potable, clean and free from injurious amounts of deleterious substances.

.12 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.

.13 Sealants for vertical joints: non-sagging.

.14 General: Provide fire-stopping systems that are produced and installed to resist the spread of fire, according to requirements indicated, and the passage of smoke and other gases.

.15 F-Rated Through-Penetration Fire-stop Systems: Provide through-penetration fire-stop systems with F ratings indicated, but not less than that equaling or exceeding the fire-resistance rating of the constructions penetrated.

.16 T-Rated Through-Penetration Fire-stop Systems: Provide through-penetration fire-stop systems with T ratings, in addition to F ratings, where indicated and where systems protect penetrating items exposed to contact with adjacent materials in occupy-able floor areas. T-rated assemblies are required where the following conditions exist:
  .1 Where fire-stop systems protect penetrations located outside of wall cavities.
  .2 Where fire-stop systems protect penetrations located outside fire-resistive shaft enclosures.
  .3 Where fire-stop systems protect penetrations located in construction containing doors required to have a temperature-rise rating.
  .4 Where fire-stop systems protect penetrating items larger than a 100 mm diameter nominal pipe or 10,000 mm² in overall cross-sectional area.

.17 Fire-Resistive Joint Sealants: Provide joint sealants with fire-resistance ratings indicated, but not less than that equaling or exceeding the fire-resistance rating of the construction in which the joint occurs.

.18 For fire-stopping exposed to view, traffic, moisture, and physical damage, provide products that do not deteriorate when exposed to these conditions.
  .1 For piping penetrations for plumbing and wet-pipe sprinkler systems, provide moisture-resistant through-penetration fire-stop systems.

.2 For floor penetrations with annular spaces exceeding 100 mm or more in width and exposed to possible loading and traffic, provide fire-stop systems capable of supporting the floor loads involved either by installing floor plates or by other means.
.3 For penetrations involving insulated piping, provide through-penetration fire-stop systems not requiring removal of insulation.

.19 For firestopping exposed to view, provide products with flame-spread values of less than 25 and smoke-developed values of less than 450.

.20 Compatibility: Provide fire-stopping composed of components that are compatible with each other, the substrates forming openings, and the items, if any, penetrating the firestopping under conditions of service and application, as demonstrated by fire-stopping manufacturer based on testing and field experience.

.21 Accessories: Provide components for each fire-stopping system that are needed to install fill materials and to comply with "System Performance Requirements". Use only components specified by the fire-stopping manufacturer and approved by the qualified testing and inspecting agency for the designated fire resistance-rated systems. Accessories include but are not limited to the following items:
.1 Permanent forming/damming/backing materials including the following:
.1 Semi-refractory fibre (mineral wool) insulation.
.2 Ceramic fibre.
.3 Sealants used in combination with other forming/damming materials to prevent leakage of fill materials in liquid state.
.4 Fire-rated formboard.
.5 Joint fillers for joint sealants.
.2 Temporary forming materials.
.3 Substrate primers.
.4 Collars.
.5 Steel sleeves.

PART 3 EXECUTION

3.1 Manufacturer’s Instructions

.1 Compliance: comply with manufacturer's written recommendations or specifications.

3.2 Preparation

.1 Examine sizes and conditions of voids to be filled to establish correct thicknesses and installation of materials.

.2 Ensure that substrates and surfaces are clean, dry and frost free.

.3 Prepare surfaces in contact with fire stopping materials and smoke seals to manufacturer's instructions.

.4 Maintain insulation around pipes and ducts penetrating fire separation without interruption to vapour retarder.

.5 Mask where necessary to avoid spillage and over coating onto adjoining surfaces; remove stains on adjacent surfaces.

3.3 Installation

.1 Install fire stopping and smoke seal material and components in accordance with manufacturer's certified tested system listing and as necessary to maintain fire resistance ratings of floor and wall assemblies.

.2 Provide fire stopping for all disciplines.

.3 Seal holes or voids made by through penetrations, poke-through termination devices, and unpenetrated openings or joints to ensure continuity and integrity of fire separation are maintained.

.4 Fill spaces between openings, ducts, pipes and unused sleeves passing through fire separations with firestop material and install firestopping systems in accordance with the appropriate ULC system number for the products and type of penetration.

.5 Provide temporary forming as required and remove forming only after materials have gained sufficient strength and after initial curing.

.6 Tool or trowel exposed surfaces to neat finish.

.7 Remove excess compound promptly as work progresses and upon completion.

3.4 Sequences of Operation

.1 Proceed only when submittals have been reviewed by Consultant.

.2 Mechanical pipe insulation: certified fire stop system component.
.1 Ensure pipe insulation installation precedes fire stopping.

3.5 Field Quality Control

.1 Inspections: notify Consultant when ready for inspection and prior to concealing or enclosing fire stopping materials and service penetration assemblies.

.2 Employ a ULC accredited Designated Responsible Individual (DRI) to inspect and label all fire stop applications on site.

.3 Manufacturer's Field Services:
.1 Obtain written report from manufacturer verifying compliance of Work, in handling, installing, applying, protecting and cleaning of product and submit Manufacturer's Field Reports as described in PART 1.4 - SUBMITTALS.
.2 Provide manufacturer's field services consisting of product use recommendations and periodic site visits for inspection of product installation in accordance with manufacturer's instructions.
.3 Schedule site visits, to review Work, as directed in PART 1.6 - QUALITY ASSURANCE.

3.6 Commissioning

.1 Employ a ULC accredited Designated Responsible Individual (DRI) to inspect and label all fire stop applications on site. Submit DRI's written reports within 3 days of review, verifying compliance of Work.

.2 Perform a thorough examination of the fire stopping system to determine if the assembly is installed as per its ULC listing.

.3 Allow for destructive testing of installed firestopping. Repair all tested assemblies.

.4 The examination shall take place prior to close-up to confirm assembly components and installation configuration.

.5 Any and all deviations from the ULC listed system shall be considered grounds for rejection and replacement.

3.7 Schedule

.1 Fire stop and smoke seal at:
- .1 Penetrations through fire-resistance rated concrete, masonry, and gypsum board partitions and walls.
- .2 Top of fire-resistance rated partitions.
- .3 Intersection of fire-resistance rated partitions.
- .4 Control and sway joints in fire-resistance rated partitions and walls.
- .5 Penetrations through fire-resistance rated floor slabs, ceilings and roofs.
- .6 Around mechanical and electrical assemblies penetrating fire separations.
- .7 Rigid ducts: greater than 129 cm²: fire stopping to consist of bead of fire stopping material between retaining angle and fire separation and between retaining angle and duct, on each side of fire separation.
- .8 All electrical outlet boxes installed in fire rated gypsum board assemblies.
- .9 All locations required by the Ontario Building Code.
- .10 Any other locations indicated.

3.8 Cleaning

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

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

.3 Remove temporary dams after initial set of fire stopping and smoke seal materials.

End of Section

PART 1 GENERAL

1.1 General

.1 Conform to the requirements of Division 1.

1.2 Related Sections

.1	Section 03 30 00	Cast-in-Place Concrete
.2	Section 04 21 13	Brick Masonry
.3	Section 04 22 00	Concrete Unit Masonry
.4	Section 05 41 00	Structural Metal Stud Framing
.5	Section 06 10 00	Rough Carpentry
.6	Section 06 20 00	Finish Carpentry
.7	Section 06 40 00	Architectural Woodwork
.8	Section 07 21 13	Building Insulation
.9	Section 07 25 00	Weather Barriers
.10	Section 07 27 00	Air Barriers
.11	Section 07 52 00	Modified Bituminous Roofing
.12	Section 07 62 00	Sheet Metal Flashing and Trim
.13	Section 07 84 00	Firestopping
.14	Section 08 11 00	Metal Doors and Fames
.15	Section 08 50 00	Aluminum Doors, Windows and Screens
.16	Section 08 80 05	Glazing

1.3 References

.1 ASTM International (ASTM)
- .1 ASTM C510-16 Standard Test Method for Staining and Color Change of Single- or Multicomponent Joint Sealants
- .2 ASTM C661-15 Standard Test Method for Indentation Hardness of Elastomeric-Type Sealants by Means of a Durometer
- .3 ASTM C719-14 Standard Test Method for Adhesion and Cohesion of Elastomeric Joint Sealants Under Cyclic Movement (Hockman Cycle) 1, 2
- .4 ASTM C794-18 Standard Test Method for Adhesion-in-Peel of Elastomeric Joint Sealants
- .5 ASTM C834-17 Standard Specification for Latex Sealants
- .6 ASTM C920-18 Standard Specification for Elastomeric Joint Sealants
- .7 ASTM C1087-16 Standard Test Method for Determining Compatibility of Liquid-Applied Sealants with Accessories Used in Structural Glazing Systems
- .8 ASTM C1193-16 Standard Guide for Use of Joint Sealants
- .9 ASTM C1247-14 Standard Test Method for Durability of Sealants Exposed to Continuous Immersion in Liquids
- .10 ASTM C1248-18 Standard Test Method for Staining of Porous Substrate by Joint Sealants
- .11 ASTM C1311-14 Standard Specification for Solvent Release Sealants
- .12 ASTM C1330-18 Standard Specification for Cylindrical Sealant Backing for Use with Cold Liquid-Applied Sealants.
- .13 ASTM D412-16 Standard Test Methods for Vulcanized Rubber and Thermoplastic Elastomers—Tension
- .14 ASTM D624-00(2012) Standard Test Method for Tear Strength of Conventional Vulcanized Rubber and Thermoplastic Elastomers
- .15 ASTM D2203-01(2018) Standard Test Method for Staining from Sealants
- .16 ASTM D2240-15e1 Standard Test Method for Rubber Property—Durometer Hardness

.2 Department of Justice Canada (Jus)
.1 Canadian Environmental Protection Act, 1999 (CEPA).
.3 U. S. Environmental Protection Agency (EPA)
.1 EPA 40 CFR 59, Subpart D - National Volatile Organic Compound Emission Standards for Architectural Coatings.
.4 South Coast Air Quality Management District (SCAQMD) California State
.1 SCAQMD Rule 1168-03: Adhesives and Sealants.

1.4 Submittals

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

.2 Submit product data for all sealant materials and accessories including:
.1 Preparation instructions and recommendations.
.2 Standard drawings illustrating manufacturer's recommended sealant joint profiles and dimensions applicable to Project.

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

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

.5 Greenguard Certificates: For each sealant and accessory product specified to meet volatile organic emissions standards of the Greenguard Children and Schools Certification.

1.5 Quality Assurance

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

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

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

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

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

.6 Compatibility: Use ASTM C1087 to determine materials forming joints and adjacent materials do not adversely affect sealant materials and do not affect sealant colour.

.7 Stain Testing: Use ASTM C510, ASTM C1248, or ASTM D2203 to verify non-staining characteristics of proposed sealants on specified substrates.

.8 Pre-construction manufacturer laboratory testing is not required when sealant manufacturer can furnish data acceptable to Consultant based on previous testing for materials matching those of the Work.

1.6 Shipping, Handling and Storage

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

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

1.7 Project Conditions

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

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

1.8 Scheduling

.1 Schedule work so waterproofing, water repellents and preservative finishes are installed after sealants, unless sealant manufacturer approves otherwise in writing.

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

1.9 Waste Management and Disposal

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

PART 2 PRODUCTS

2.1 Manufacturer

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

2.2 Materials, General

.1 VOC Content for Interior Applications: Provide sealants and sealant primers complying with the following VOC content limits per 40 CFR 59, Subpart D (EPA Method 24):
  .1 Architectural Sealants: 250 g/L.
  .2 Sealant Primers for Nonporous Substrates: 250 g/L.
  .3 Sealant Primers for Porous Substrates: 775 g/L.

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

.3 Compatibility: Provide joint sealants and accessory materials that are compatible with one another, and with adjacent materials, as demonstrated by sealant manufacturer using ASTM C1087 testing and related experience.

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

.5 Stain Test Characteristics: Where sealants are required to be non-staining, provide sealants tested per ASTM C1248 as non-staining on porous joint substrates specified.

2.3 Silicone Joint Sealants

.1 SJS#1: Single-Component, Nonsag, Non-Staining, Moisture-Curing Silicone Joint Sealant: ASTM C920, Type S, Grade NS, Class 100/50, Use NT; SWRI validated.
- .1 Basis of Design Product: Tremco Spectrem 1.
- .2 Volatile Organic Compound (VOC) Content: 1 g/L maximum.
- .3 Volatile Organic Emissions (VOE): Not greater than Greenguard Children & Schools Certification emissions levels.
- .4 Staining, ASTM C1248: None on concrete, marble, granite, limestone, and brick.
- .5 Colour: As selected by Consultant from manufacturer's standard line.

.2 SJS#2: Single-Component, Nonsag, Non-Staining, Neutral-Curing Silicone Joint Sealant: ASTM C920, Type S, Grade NS, Class 50, Use NT; SWRI validated.
- .1 Basis of Design Product: Tremco Spectrem 2.
- .2 Volatile Organic Compound (VOC) Content: 50 g/L maximum.
- .3 Volatile Organic Emissions (VOE): Not greater than Greenguard Children & Schools Certification emissions levels.
- .4 Staining, ASTM C1248: None on concrete, marble, granite, limestone, and brick.
- .5 Colour: As selected by Consultant from manufacturer's standard line.

.3 SJS#3: Single-Component, Nonsag, Non-Staining, Neutral-Curing Silicone Joint Sealant: ASTM C920, Type S, Grade NS, Class 50, Use NT.
- .1 Basis of Design Product: Tremco Spectrem 3.
- .2 Volatile Organic Compound (VOC) Content: 20 g/L maximum.
- .3 Volatile Organic Emissions (VOE): Not greater than Greenguard Children & Schools Certification emissions levels.
- .4 Staining, ASTM C1248: None on concrete, marble, granite, limestone, and brick.
- .5 Colour: As selected by Consultant from manufacturer's standard line.

.4 SJS#4: Multi-Component, Nonsag, Non-Staining, Field-Tintable Neutral-Curing Silicone Joint Sealant: ASTM C920, Type S, Grade NS, Class 50, Use NT.
- .1 Basis of Design Product: Tremco Spectrem 4-TS.
- .2 Volatile Organic Compound (VOC) Content: 20 g/L maximum.
- .3 Volatile Organic Emissions (VOE): Not greater than Greenguard Children & Schools Certification emissions levels.
- .4 Staining, ASTM C1248: None on concrete, marble, granite, limestone, and brick.
- .5 Colour: As selected by Consultant from manufacturer's standard line.

.5 SJS#5: Mildew-Resistant, Single-Component, Acid-Curing Silicone Joint Sealant: ASTM C920, Type S, Grade NS, Class 25, Use NT.
- .1 Basis of Design Product: Tremco Tremsil 200 Sanitary.
- .2 Volatile Organic Compound (VOC) Content: 1 g/L maximum.
- .3 Volatile Organic Emissions (VOE): Not greater than Greenguard Children & Schools Certification emissions levels.
- .4 Colour: White and Clear.

2.4 Urethane Joint Sealants

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

.2 UJS#2: Single-Component, Nonsag, Moisture-Cure, Polyurethane Hybrid Joint Sealant: ASTM C920, Type S, Grade NS, Class 35, Use NT; Greenguard certified.
- .1 Basis of Design Product: Tremco Dymonic FC.
- .2 Extrusion Rate ASTM C1183: 93.1 mL/min
- .3 Weight Loss ASTM C1246: Pass
- .4 Tack Free Time ASTM C679: 3 to 4 hours.
- .5 Volatile Organic Compound (VOC) Content: 10 g/L maximum.
- .6 Volatile Organic Emissions (VOE): Not greater than Greenguard Children & Schools Certification emissions levels.
- .7 Colour: As selected by Consultant from manufacturer's standard line.

.3 UJS#3: Single-Component, Nonsag, Polyurethane Joint Sealant: ASTM C920, Type S, Grade NS, Class 25, Use NT.
- .1 Basis of Design Product: Tremco Vulkem 116.
- .2 Volatile Organic Compound (VOC) Content: 60 g/L maximum.
- .3 Colour: As selected by Consultant from manufacturer's standard line.

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

.5 UJS#5: Immersible, Multi-Component, Pourable, Traffic-Grade Polyurethane Joint Sealant: ASTM C920, Type M, Grade P, Class 35, Use T, O, and I.
- .1 Basis of Design Product: Tremco Vulkem 445SSL.
- .2 Tensile Strength, ASTM D412: 1.7 MPa, at 100 percent elongation.
- .3 Tear Strength, ASTM D412: 6.1 kN/m.
- .4 Adhesion to Concrete, After Water, ASTM C794: 4.4 kN/m
- .5 Hardness, ASTM C661: 40 durometer Shore A, minimum.
- .6 Accelerated Weathering, ASTM C793: Pass.
- .7 Volatile Organic Compound (VOC) Content: 106 g/L maximum.
- .8 Colour: As selected by Consultant from manufacturer's standard line.

.6 UJS#6: Multi-Component, Non-sag, Polyurethane Joint Sealant: ASTM C920, Type M, Grade NS, Class 50, Use I.
- .1 Basis of Design Product: Tremco Dymeric 240 FC.

.2 Volatile Organic Compound (VOC) Content: 0 g/L maximum.
.3 Volatile Organic Emissions (VOE): Not greater than Greenguard Children & Schools Certification emissions levels.
.4 Colour: As selected by Consultant from manufacturer's standard line.

2.5 Latex Joint Sealants

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

2.6 Solvent-Release-Curing Joint Sealants

.1 BJS#1: Butyl-Rubber-Based Joint Sealant: ASTM C1311.
.1 Basis of Design Product: Tremco Tremco Butyl Sealant.
.2 Volatile Organic Compound (VOC) Content: 250 g/L maximum.
.3 Colour: As selected by Consultant from manufacturer's standard colours.

2.7 Acoustical Sealants

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

2.8 Joint Sealant Accessories

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

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

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

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

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

PART 3 EXECUTION

3.1 Examination

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

3.2 Preparation

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

3.3 Application

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

.2 Joint Backing: Select joint backing materials recommended by sealant manufacturer as compatible with sealant and adjacent materials. Install backing material at depth required to produce profile of joint sealant allowing optimal sealant movement.
  .1 Install joint backing to maintain the following joint ratios:
    .1 Joints up to 13 mm wide: 1:1 width to depth ratio.
    .2 Joints greater than 13 mm wide: 2:1 width to depth ratio; maximum 13 mm joint depth.
  .2 Install bond breaker tape over substrates when sealant backings are not used.

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

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

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

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

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

3.4 Field Quality Control

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

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

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

3.5 Exterior Joint Sealant Schedule

.1 Exterior concealed transition joints in air barrier.
  .1 SJS#1: Single-component neutral-curing low-modulus silicone sealant.
  .2 UJS#1: Single-component non-sag urethane sealant.
  .3 Compatibility: Compatible with air barrier components specified in Section 07 27 13.

.2 Exterior construction joints.
  .1 SJS#1, SJS#2: Single-component neutral-curing non-staining silicone sealant.
  .2 SJS# 4: Multi-component neutral-curing non-staining field tintable silicone sealant.
  .3 UJS#1, UJS#2, UJS#3: Single-component non-sag urethane sealant.

.3 Exterior movement joints in brick masonry.
  .1 SJS#1, SJS# 2: Single-component neutral-curing non-staining silicone sealant.
  .2 SJS#4: Multi-component neutral-curing non-staining field tintable silicone sealant.
  .3 UJS#1, UJS#2, UJS#3: Sing**le**-component non-sag urethane sealant.

.4 Exterior joints between different materials listed above.
  .1 SJS#1, SJS# 2: Single-component neutral-curing non-staining silicone sealant.
  .2 SJS#4: Multi-component neutral-curing non-staining field tintable silicone sealant.
  .3 UJS#1, UJS#2: Single-component non-sag urethane sealant.

.5 Exterior perimeter joints at frames of doors, windows, storefront frames, curtain wall frames, and louvers.
  .1 SJS#1, SJS# 2: Single-component neutral-curing non-staining silicone sealant.
  .2 SJS#4: Multi-component neutral-curing non-staining field tintable silicone sealant.
  .3 UJS#1, UJS#2: Single-component non-sag urethane sealant.

.6 Exterior joints within aluminum storefront framing, curtain walls, and window systems:
  .1 SJS#1, SJS# 2: Single-component neutral-curing non-staining silicone sealant.

.7 All other exterior non-traffic joints.
  .1 SJS#1, SJS# 2: Single-component neutral-curing non-staining silicone sealant.
  .2 SJS#4: Multi-component neutral-curing non-staining field tintable silicone sealant.
  .3 UJS#1, UJS#2: Single-component non-sag urethane sealant.

3.6 Interior Joint Sealant Schedule

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

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

.3 Interior perimeter joints of exterior aluminum frames.
  .1 UJS#1: Single-component non-sag urethane sealant.

.4 Interior perimeter joints of interior frames.
  .1 UJS#2: Single-component non-sag urethane sealant.
  .2 LJS#1: Siliconized acrylic latex

.5 Interior sanitary joints between plumbing fixtures, food preparation fixtures, and casework and adjacent walls, floors, and counters.
  .1 SJS#5: Mildew-Resistant, Single-Component, nonsag, acid-curing silicone joint sealant.

.6 Interior traffic joints in floor and between floor and wall construction.
  .1 UJS# 4, UJS#5: Single-component pourable urethane sealant.

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

.8 Interior concealed sealants at thresholds and sills.
  .1 BJS#1: Butyl-rubber-based joint sealant.

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

3.7 Cleaning

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

End of Section

PART 1 GENERAL

1.1 General

.1 Conform to the requirements of Division 1.

1.2 Related Sections

.1 Section 04 21 13 Brick Masonry
.2 Section 04 22 00 Concrete Unit Masonry
.3 Section 06 10 00 Rough Carpentry
.4 Section 07 92 00 Joint Sealants
.5 Section 08 14 16 Flush Wood Doors
.6 Section 08 71 10 Door Hardware
.7 Section 08 71 13 Automatic Door Operators
.8 Section 08 80 05 Glazing
.9 Section 09 21 16 Gypsum Board
.10 Section 09 22 16 Non-Structural Metal Framing
.11 Section 09 91 13 Exterior Painting
.12 Section 09 91 23 Interior Painting

1.3 References

.1 ASTM International (ASTM)
  .1 ASTM A653/A653M-18 Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process
  .2 ASTM C177-19 Standard Test Method for Steady-State Heat Flux Measurements and Thermal Transmission Properties by Means of the Guarded-Hot-Plate Apparatus
  .3 ASTM C518-17 Standard Test Method for Steady-State Thermal Transmission Properties by Means of the Heat Flow Meter Apparatus
  .4 ASTM C553-13 Standard Specification for Mineral Fiber Blanket Thermal Insulation for Commercial and Industrial Applications
  .5 ASTM C591-17 Standard Specification for Unfaced Preformed Rigid Cellular Polyisocyanurate Thermal Insulation
  .6 ASTM C1289-18a Standard Specification for Faced Rigid Cellular Polyisocyanurate Thermal Insulation Board
  .7 ASTM E90-09 (2016) Standard Test Method for Laboratory Measurement of Airborne Sound Transmission Loss of Building Partitions and Elements.
  .8 ASTM E330/E330M-14 Standard Test Method for Structural Performance of Exterior Windows, Doors, Skylights and Curtain Walls by Uniform Static Air Pressure Difference.
  .9 ASTM E2074-00e1 Standard Test Method for Fire Tests of Door Assemblies, Including Positive Pressure Testing of Side-Hinged and Pivoted Swinging Door Assemblies (Withdrawn 2007)
.2 Canadian General Standards Board (CGSB)
  .1 CAN/CGSB-1.181-99 Ready-Mixed Organic Zinc-Rich Coating.
  .2 CGSB 41-GP-19M-84 Rigid Vinyl Extrusions for Windows and Doors.
.3 CSA Group (CSA)
  .1 CSA-G40.20-13/G40.21-13 General Requirements for Rolled or Welded Structural Quality Steel/Structural Quality Steel.
  .2 CSA W59-18 Welded Steel Construction (Metal Arc Welding).

.4 Canadian Steel Door Manufacturers' Association (CSDMA)
  .1 CSDMA Recommended Dimensional Standards for Commercial Steel Doors and Frames, 2000
  .2 CSDMA Recommended Specifications for Commercial Steel Doors and Frames, 2006.
  .3 CSDMA Selection and Usage Guide for Commercial Steel Door and Frame Products, 2009.
.5 Underwriters Laboratories Canada (ULC)
  .1 ULC 104-2015 Standard Method for Fire Tests of Door Assemblies.
  .2 ULC 105- 2016 Standard Specification for Fire Door Frames Meeting the Performance Required by CAN/ULC-S104.
  .3 ULC 106-2015 Standard Method for Fire Tests of Window and Glass Block Assemblies
  .4 ULC 701-2011 Standard for Thermal Insulation, Polystyrene, Boards and Pipe Covering.
  .5 ULC 702.1- 2014 Standard for Thermal Insulation, Mineral Fibre, for Buildings.
  .6 ULC 704-11 Standard for Thermal Insulation, Polyurethane and Polyisocyanurate Boards, Faced.
.6 Underwriters Laboratories (UL)
  .1 UL10B Fire Tests of Door Assemblies.
  .2 UL10C Standard for Positive Pressure Fire Tests of Door Assemblies.
.7 National Fire Protection Association (NFPA)
  .1 NFPA 80-2019 Standard for Fire Doors and Other Opening Protectives.
  .2 NFPA 252-2017 Fire Tests of Door Assemblies.
.8 American National Standards Institute (ANSI)
  .1 ANSI 250.4-2018 Test Procedure and Acceptance Criteria for — Physical Endurance for Steel Doors, Frames and Frame Anchors
  .2 ANSI 250.10-2011 Test Procedure and Acceptance Criteria for Prime Painted Steel Surfaces for Steel Doors and Frames

1.4 Submittals

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

.2 Provide shop drawings
  .1 Indicate each type of door, material, steel core thicknesses, mortises, reinforcements, location of exposed fasteners, openings, arrangement of hardware, and finishes.
  .2 Indicate each type frame material, core thickness, reinforcements, location of anchors and exposed fastenings, reinforcing, fire rating and finishes.
  .3 Include schedule identifying each unit, with door marks and numbers relating to numbering on drawings and door schedule.

1.5 System Description

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

1.6 Shipping, Handling and Storage

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

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

1.7 Requirements of Regulatory Agencies

.1 Steel fire rated doors and frames: labeled and installed by an organization accredited by Standards Council of Canada in conformance with ULC 104 or NFPA 252 for ratings specified or indicated.

.2 Provide fire labeled frame products for those openings requiring fire protection ratings, as scheduled. Test products in strict conformance with ULC 104, ASTM E2074 or NFPA 252 and list by nationally recognized agency having factory inspection service and construct as detailed in Follow-up Service Procedures/Factory Inspection Manuals issued by listing agency to individual manufacturers.

1.8 Testing and Performance

.1 Fire labeled products shall be provided for those openings requiring fire protection ratings as scheduled on the drawings. Products shall be tested in strict conformance with ULC 104 and listed by Underwriters Laboratory of Canada Ltd. or Warnock Hersey under an active Factory Inspection Program.

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

.3 Door construction shall meet acceptance criteria of ANSI A250.10 and shall be certified as meeting Level A (1,000,000 cycles) and Twist Test Acceptance Criteria deflection not to exceed 6.4 mm/13.6 kg force, total deflection at 136.1 kg force not to exceed 64 mm and permanent deflection not to exceed 3.0 mm when tested in strict conformance with ANSI A250.4. Test shall be conducted by an independent nationally recognized accredited laboratory.

.4 Core materials for insulated doors shall attain a thermal resistance rating of RSI 2.17 when tested in accordance with ASTM C177 or ASTM C518.

1.9 Waste Management and Disposal

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

PART 2 PRODUCTS

2.1 Materials

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

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

2.2 Door Core Material

.1 Interior Doors: Structural small cell, 24.5mm maximum kraft paper 'honeycomb', weight 36.3 kg per ream minimum, density: 16.5 kg/m³ minimum sanded to required thickness. ULC approved.

.2 Exterior Doors: Polyisocyanurate: Rigid, modified polyisocyanurate, closed cell board. Density; 32 kg/m3 minimum, thermal values; RSI 1.9 minimum, in accordance with ASTM C591 (un-faced) or ASTM C1289 (faced).

.3 Temperature Rise Rated (TRR) Core composition to provide the fire-protection rating and limit the temperature rise on the unexposed side of door to 250°C at 30 or 60 minutes, as determined by governing building code requirements. Core to be tested as part of a complete door assembly, in accordance with ULC 104 covering the Standard Method of Tests of Door Assemblies and shall be listed by a nationally recognized testing agency having a factory inspection service.

2.3 Primer

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

2.4 Adhesives

.1 Adhesive: maximum VOC content 50 g/L to SCAQMD Rule 1168.

.2 Honeycomb cores and steel components: heat resistant, spray grade, resin reinforced neoprene/rubber (polychloroprene) based, low viscosity, contact cement.

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

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

2.5 Accessories

.1 Glazing Stops: Minimum 0.9 mm base thickness sheet steel with wipe zinc finish to ASTM A525. Fasteners to be #6 x 32 mm cadmium plated oval head scrulox self-drilling type screws. Tamper proof screws.

.2 Exterior top caps: rigid polyvinylchloride extrusion conforming to CGSB 41-GP-19Ma.

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

.4 Frame Thermal Breaks: Rigid polyvinylchloride extrusion conforming to CGSB 41-GP-19MA.

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

.6 Fiberglass: to ULC 702, loose batt type, minimum density of 24 kg/m³.

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

2.6 Fabrication - Frame Products

.1 General
.1 Fabricate frames in accordance with CSDMA specifications.
.2 Fabricate frames to profiles and maximum face sizes as indicated.
.3 Exterior frame product shall be 1.60 mm welded type construction, thermally broken.
.4 Interior frame product shall be 1.60 mm. Interior frames, transoms, sidelights and window assemblies shall be welded type construction.
.5 Blank, reinforce, drill and tap frames for templated hardware and electronic hardware using templates provided by finish hardware supplier. Reinforce frames for surface mounted hardware.

.6 Prepare frames to receive electrical conduit for door operators where indicated and required.
.7 Protect mortised cutouts with steel guard boxes.
.8 Provide anchorage appropriate to floor, wall and frame construction. Each wall anchor shall be located immediately above or below each hinge reinforcement on the hinge jamb and directly opposite on the strike jamb. For rebate opening heights up to and including 1520 mm provide two (2) anchors, and an additional anchor for each additional 760 mm of height or fraction thereof, except as indicated below. Frames in previously placed concrete, masonry or structural steel shall be provided with anchors located not more than 150 mm from the top and bottom of each jamb, and intermediate anchors at 660 mm on centre maximum. Fasteners for such anchors shall be provided by others.
.9 Minimum reinforcing, anchor and other component thickness shall be in accordance with Table 1 of the CSDMA, "Recommended Specifications for Commercial Steel Door and Frame Products".
.10 Each interior door opening shall be prepared for single stud rubber door silencers, three (3) for single door openings, two for double door openings, except on gasketed frame product.
.11 Provide factory-applied touch up primer at areas where zinc coating has been removed during fabrication.
.12 Fire-rated frame products shall be provided for those openings requiring fire protection as determined and scheduled by the Consultant. Frames, transom and sidelight assemblies shall be listed for conformance with ULC 104. Window assemblies shall be listed for conformance with ULC 106. All fire-rated frame products shall bear the label of and be listed by a nationally recognized testing agency having a factory inspection service. Labeling shall be in accordance with NFPA 80, the listing authority's policies and label materials, and shall identify the manufacturer. Fire-rated frame products shall be constructed as listed for labeling in the Follow-Up Service Procedures/Factory Inspection Manuals issued by the listing agency to individual manufacturers.

.2 Welded Type
.1 Welding in accordance with CSA W59.
.2 Accurately mitre or mechanically joint frame product and securely weld on inside of profile.
.3 Cope accurately and securely weld butt joints of mullions, transom bars, centre rails and sills.
.4 Grind welded joints and corners to a flat plane, fill with metallic paste and sand to uniform smooth finish.
.5 Where frame product is to be installed prior to the adjacent partition, a floor anchor shall be securely attached to the inside of each jamb profile. Each floor anchor shall be provided with two holes for securing to the floor. For conditions that do not permit the use of a floor anchor, an additional wall anchor, located within 150 mm of the base of the jamb, shall be substituted.
.6 Weld in two temporary jamb spreaders per door opening to maintain proper alignment during shipment and handling, which shall not be used for installation.
.7 Glazing stops shall be formed steel channel, minimum 16 mm height, accurately fitted, butted at corners and fastened to frame sections with counter-sunk oval head sheet metal screws.
.8 When required due to site access, when advised by the contractor responsible for coordination or installation, as specified on the drawings or due to shipping limitations, frame product for large openings shall be fabricated in sections as designated on the approved submittal drawings, with splice joints for field assembly and welding by others.
.9 Prior to shipment, mark each frame product with an identification number as shown on the approved submittal drawings.
.10 Provide factory-applied touch up primer at areas where zinc coating has been removed during fabrication.
.11 Manufacturer's nameplates on frames and screens are not permitted

2.7 Fabrication - Doors

.1 General
  .1 Interior doors: insulated steel construction with honeycomb core laminated to face sheets under pressure.
  .2 Interior doors: insulated steel construction with honeycomb core laminated to minimum 1.19 mm nominal thickness steel face sheets under pressure.
  .3 Exterior doors: insulated steel construction with polyisocyanurate core laminated to minimum 1.19 mm nominal thickness steel face sheets under pressure.
  .4 Voids between vertical stiffeners shall be filled with fiberglass batt type insulation.
  .5 Doors: swing type, flush.
  .6 Doors: manufacturers' proprietary construction, tested and/or engineered as part of a fully operable assembly, including door, frame, gasketting and hardware in accordance with ASTM E330.

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

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

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

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

.6 Top and bottom of doors shall be provided with inverted, recessed, welded steel channels. Exterior doors, and where otherwise scheduled by the Consultant, shall be provided with rigid PVC top caps.

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

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

.9 Fire-rated doors shall be provided for those openings requiring fire protection and temperature rise ratings, as indicated. Such products shall be listed for conformance with ULC 104. All fire-rated doors shall bear the label of and be listed by a nationally recognized testing agency having a factory inspection service. Labeling shall be in accordance with NFPA 80, the listing authority's policies and label materials, and shall identify the manufacturer. Fire-rated doors shall be constructed as listed for labeling in the Follow-Up Service Procedures/Factory Inspection Manuals issued by the listing agency to individual manufacturers.

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

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

2.8 Glazing Stops

.1 Glazing stops shall be accurately fitted, butted at corners with removable stops located on push side of door.

.2 Provide tamper proof screws on all doors and screens.

2.9 Finishes

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

PART 3 EXECUTION

3.1 Manufacturer’s Instructions

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

3.2 Installation

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

.2 Fire-rated door and frame product shall be installed in accordance with NFPA-80.

.3 Prior to installation, remove temporary shipping spreaders.

.4 Prior to installation, the area of floor on which the frame is to be installed, and within the path of the door swing, shall be checked and corrected for flatness.

.5 Check door and frame product for correct size, swing, rating and opening number.

.6 The supplier shall be advised of any discrepancies prior to installation.

.7 Set frames plumb, square, level and at correct elevation.

.8 Secure anchorages and connections to adjacent construction.

.9 Brace frames rigidly in position while building-in. Install wood spreaders at third points of frame rebate height to maintain frame width. Provide vertical support at centre of head for openings exceeding 1200 mm in width.

.10 During the setting of frame product, check and correct as necessary for opening width, opening height, square, alignment, twist and plumb, in accordance with the CSDMA, "Recommended Dimensional Standards for Commercial Steel Doors and Frames".

.11 Remove wood spreaders after frames have been built-in.

.12 Make allowance for deflection to ensure structural loads are not transmitted to frame product.

.13 Install doors and hardware in accordance with hardware templates and manufacturer's instructions and Section 08 71 00 - Door Hardware.

.14 Adjust operable parts for correct clearances and function.

.15 Install louvers, glazing and door silencers.

.16 Provide even margins between doors and jambs and doors and finished floor and thresholds as follows:
- .1 Hinge side: 1.0 mm.
- .2 Latchside and head: 1.5 mm.
- .3 Finished floor and thresholds: 13 mm.
- .4 Adjust operable parts for correct function.

.17 Coordinate with Section 08 71 10 for preparation and installation of automatic door operators.

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

3.3 Finish Repairs

.1 Touch up with primer finishes damaged during installation.

.2 Fill exposed frame anchors and surfaces with imperfections with metallic paste filler and sand to a uniform smooth finish.

3.4 Cleaning

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

End of Section

PART 1 GENERAL

1.1 General

.1 Conform to the requirements of Division 1.

1.2 Related Sections

.1 Section 06 20 00 Finish Carpentry
.2 Section 08 11 00 Metal Doors and Frames
.3 Section 08 71 10 Door Hardware
.4 Section 09 91 23 Interior Painting

1.3 References

.1 ASTM International (ASTM)
  .1 ASTM D1761-12 Standard Test Methods for Mechanical Fasteners in Wood
  .2 ASTM D5456-18 Standard Specification for Evaluation of Structural Composite Lumber Products
  .3 ASTM E90-09(2016) Standard Test Method for Laboratory Measurement of Airborne Sound Transmission Loss of Building Partitions and Elements
  .4 ASM E413-16 Classification for Rating Sound Insulation
  .5 ASTM E1332-16 Standard Classification for Rating Outdoor-Indoor Sound Attenuation
  .6 ASTM E2235-04(2012) Standard Test Method for Determination of Decay Rates for Use in Sound Insulation Test Methods
.2 American National Standards Institute (ANSI):
  .1 ANSI A208.1 - Standard for Particleboard.
.3 CSA Group (CSA)
  .1 CSA O115-M1982 (R2001) Hardwood and Decorative Plywood.
  .2 CSA O132.2 Series-90 (R2003) Wood Flush Doors
.4 Canadian General Services Board (CGSB)
  .1 CAN/CGSB-71.19 Adhesive, Contact, Sprayable
  .2 CAN/CGSB-71.20 Adhesive, Contact, Brushable
.5 Underwriters Laboratories Canada (ULC)
  .1 ULC 104-2015 Standard Method for Fire Tests of Door Assemblies.
.6 National Fire Protection Association (NFPA)
  .1 NFPA 80 Standard for Fire Doors and Other Opening Protectives.
  .2 NFPA 252 Standard Method of Fire Test for Door Assemblies.
.7 Architectural Woodwork Manufacturers Association of Canada (AWMAC): Quality Standards for Architectural Woodwork
.8 Window and Door Manufacturer’s Association (WDMA)
  .1 ANSI/WDMA I.S. 1A-13 Interior Architectural Wood Flush Doors
.9 South Coast Air Quality Management District (SCAQMD), California State
  .1 SCAQMD Rule 1113-06 Architectural Coatings.
  .2 SCAQMD Rule 1168-03 Adhesives and Sealants Applications.
.10 Green Seal Environmental Standards
  .1 Standard GS-11-97 Architectural Paints.

1.4 Submittals

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

.1 Submit manufacturer's printed product literature, specifications and data sheets for door materials and adhesives.

.2 Submit shop drawings and door schedules.
.1 Indicate door types, sizes, thicknesses, and details of construction.

.3 Submit samples.
.1 Submit one 300 x 300 mm corner sample of each type wood door.
.2 Show door construction, core, glazing detail and faces.

.4 Manufacturer's Instructions:
.1 Submit manufacturer's installation instructions.

1.5 Quality Assurance

.1 The “Quality Standards” of the Architectural Woodwork Manufacturers Association of Canada (AWMAC), 1991 Edition, together with authorized additions and amendments, shall be used as a reference standard and shall form part of this project specification.

.2 Where modifications to the AWMAC Quality Standards contained within the Manual are included in this project specification, then such modifications shall govern in case of conflict.

.3 Any reference to Custom or Premium grade in this specification shall be as defined in the AWMAC Quality Standards.

.4 Any item not given a specific quality grade shall be Custom grade as defined in the AWMAC Quality Standards.

.5 References in this specification to part and item numbers mean those parts and items contained within the AWMAC Quality Standards Manual.

1.6 Shipping, Handling and Storage

.1 Refer to Section 01 16 00 – Common Product Requirements.

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

.3 Wood door delivery, storage and handling shall be in accordance with Part 6, Item 3, of the AWMAC Quality Standards.

.4 Do not deliver wood doors until the building and storage areas are sufficiently dry so that the wood doors will not be damaged by excessive changes in moisture content.

.5 Delivered materials which are damaged in any way or do not comply with these specifications will be rejected by the Consultant and shall be removed from the job site and replaced with acceptable materials.

1.7 Waste Management and Disposal

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

1.8 Warranty

.1 Warrant the work of this Section against defects of workmanship and material, for a period of two (2) years from the date of Substantial Performance and agree to make good promptly any defects which occur or become apparent within the warranty period.

PART 2 PRODUCTS

2.1 Manufacturers

.1 Acceptable Manufacturers: Member in good standing of the Architectural Woodwork Manufacturers Association of Canada (AWMAC) with minimum 5 years of production experience similar to this project, whose qualifications indicate ability to comply with requirements of this Section.

2.2 Materials

.1 All door materials to conform to CSA 0132.2-M.

.2 Doors shall be constructed of solid laminated wood core with 3.0 mm thick Grade A face, book matched, flat cut maple, 50 mm stiles and 76 mm top and bottom rails. Stiles to be No. 3 maple edge.

.3 Core shall consist of low density wood blocks, random lengths with staggered joints. All cores shall be drum sanded both sides.

.4 Door thickness: as indicated.

.5 Adhesive: To CSA 0132.2, Type II, water resistant, for interior use.

PART 3 EXECUTION

3.1 Fabrication

.1 Fabricate doors in accordance with CSA 0132.2.

.2 Provide No. 3 vertical edge strips to match face veneer.

.3 Bevel vertical edges of single acting doors 3.0 mm on lock side and 1.6 mm on hinge side.

.4 Prepare doors for hardware.

.5 Fabricate doors with reinforced openings for louvres, door grilles and glazed lites. Provide manufacturer’s standard trim and stops.

.6 Doors to be fabricated with factory finish and stained accordingly as per finish schedule.

.7 Sand and prepare doors to receive clear urethane finish as indicated on the Room Finish and Door Schedules.

3.2 Installation

.1 Unwrap and protect doors in accordance with CSA-O132.2 Series, Appendix A.

.2 Install doors and hardware in accordance with manufacturer's printed instructions and CSA-0132.2 Series, Appendix A.

.3 Install glazing in accordance with Section 08 80 05.

.4 Adjust hardware for correct function.

.5 Doors to receive clear urethane finish as specified in Section 09 91 23.

3.3 Final Adjustment

.1 Re-adjust doors and hardware just prior to completion of building to function freely and properly

3.4 Cleaning

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

End of Section

PART 1 GENERAL

1.1 General

.1 Conform to the requirements of Division 1.

1.2 Related Sections

.1 Section 06 20 00 Finish Carpentry
.2 Section 08 11 00 Metal Doors and Frames
.3 Section 08 14 16 Flush Wood Doors
.4 Section 08 50 00 Aluminum Doors, Windows and Screens

1.3 References

.1 American National Standards Institute (ANSI) / Builders Hardware Manufacturers Association (BHMA)
  .1 ANSI/DHI A115.1G-1994 Installation Guide for Doors and Hardware
  .2 ANSI/ICC A117.1-2017 Accessible and Usable Buildings and Facilities
  .3 ANSI/BHMA A156.1-2013 American National Standard for Butts and Hinges.
  .4 ANSI/BHMA A156.2-2011 Bored and Preassembled Locks and Latches.
  .5 ANSI/BHMA A156.3-2014 Exit Devices.
  .6 ANSI/BHMA A156.4-2013 Door Controls - Closers.
  .7 ANSI/BHMA A156.5-2014 Auxiliary Locks and Associated Products.
  .8 ANSI/BHMA A156.6-2010 Architectural Door Trim.
  .9 ANSI/BHMA A156.8-2010 Door Controls - Overhead Stops and Holders.
  .10 ANSI/BHMA A156.10-2011 Power Operated Pedestrian Doors.
  .11 ANSI/BHMA A156.12-2013 Interconnected Locks and Latches.
  .12 ANSI/BHMA A156.13-2012 Mortise Locks and Latches Series 1000.
  .13 ANSI/BHMA A156.15-2011 Release Devices - Closer Holder, Electromagnetic and Electromechanical.
  .14 ANSI/BHMA A156.16-2013 Auxiliary Hardware.
  .15 ANSI/BHMA A156.17-2014 Self-closing Hinges and Pivots.
  .16 ANSI/BHMA A156.18-2012 Materials and Finishes.
  .17 ANSI/BHMA A156.19-2013 Power Assist and Low Energy Power - Operated Doors.
  .18 ANSI/BHMA A156.21-2014 Thresholds.
  .19 ANSI/BMHA A156.22-2012 Door Gasketing and Edge Seal Systems
.2 Canadian Steel Door Manufacturers' Association (CSDMA)
  .1 CSDMA Canadian Metric Guide for Steel Doors and Frames (Modular Construction): Standard Hardware Location Dimensions.
.3 National Wood Window and Door Association (NWWDA)
.4 Door Hardware Institute (DHI)
.5 Accessibility for Ontarians with Disabilities Act (AODA)

1.4 Submittals

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

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

.3 Samples:
  .1 Identify each sample by label indicating applicable specification paragraph number, brand name and number, finish and hardware package number.

.2 After approval samples will be returned for incorporation in the Work.

.4 Hardware List:
.1 Submit contract hardware schedule prepared by a Registered Architectural Hardware Consultant (AHC) and based on School Boards Standards, review with attached hardware schedule.
.2 Indicate specified hardware, including make, model, material, function, size, finish and other pertinent information based upon the attached hardware schedule.

.5 Manufacturer's Instructions: Submit manufacturer's installation instructions.

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

1.5 Quality Assurance

.1 Regulatory Requirements:
.1 Hardware for doors in fire separations and exit doors certified by a Canadian Certification Organization accredited by Standards Council of Canada.
.2 Test Reports: certified test reports showing compliance with specified performance characteristics and physical properties.
.3 Certificates: product certificates signed by manufacturer certifying materials comply with specified performance characteristics and criteria and physical requirements.

.2 Pre-installation Meetings: conduct pre-installation meeting to verify project requirements, manufacturer's installation instructions and manufacturer's warranty requirements.

1.6 Shipping, Handling and Storage

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

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

.3 Package each item of hardware including fastenings, separately or in like groups of hardware, label each package as to item definition and location.

.4 Receive the delivery of the Finishing Hardware and identify all items against the Finishing Hardware Schedule. Ensure each hardware item is accompanied by the correct template, installation instructions, special tools, fastening devices and other loose items. Advise the finish hardware supplier and Consultant in writing of errors or omissions.

.5 Storage and Protection: Store finishing hardware in locked, clean and dry area.

.6 Remove all hardware from doors and frames prior to painting. After painting is complete and dry, reinstall all hardware to manufacturer’s recommendations.

1.7 Waste Management and Disposal

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

1.8 Warranty

.1 Warrant all hardware against defects of workmanship and material, for a period of one year, except for door closers which shall be warranted for ten years from the date of Substantial Performance and agree to make good promptly any defects which occur or become apparent within the warranty period.

PART 2 PRODUCTS

2.1 Materials

.1 All hardware shall be supplied as specified in the Finishing Hardware Schedule.

.2 All finishes shall be as indicated in the Finishing Hardware Schedule by international codes.

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

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

2.2 Fastenings

.1 Use only fasteners provided by manufacturer. Failure to comply may void warranties and applicable licensed labels.

.2 Supply screws, bolts, expansion shields and other fastening devices required for satisfactory installation and operation of hardware.

.3 Exposed fastening devices to match finish of hardware.

.4 Where pull is scheduled on one side of door and push plate on other side, supply fastening devices, and install so pull can be secured through door from reverse side. Install push plate to cover fasteners.

.5 Use fasteners compatible with material through which they pass.

2.3 Electrified Devices

.1 Electrified exit devices shall conform to all traditional exit device standards as specified above. All power requirements for exit devices used must utilize a continuous circuit electric hinge for clean design and no visible means of interrupting power to device.

.2 All exit devices with electric latch retraction shall provide for a remote means of unlocking for momentary or maintained periods of time.

.3 Exit devices with electrified trim shall be fail-secure unless otherwise specified.

.4 Where specified exit devices shall be provided with a switch to monitor push rail or signal remote location and latchbolt monitoring.
.1 Specified Manufacturers: Corbin ED4000/5000 Series.

2.4 Keying

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

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

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

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

.5 Furnish the following:
.1 Key Management Software: KW-SSN1. Confirm requirement of new or upgraded software with Owner.

PART 3 EXECUTION

3.1 Manufacturer’s Instructions

.1 Compliance: comply with manufacturer's written data, including product technical bulletins, product catalogue installation instructions, product carton installation instructions, and data sheets.

.2 Furnish metal door and frame manufacturers with complete instructions and templates for preparation of their work to receive hardware.

.3 Furnish manufacturers' instructions for proper installation of each hardware component.

3.2 Examination

.1 Before installing any hardware, carefully check all architectural drawings of the work requiring hardware, verify door swings, door and frame materials and operating conditions, and assure that all hardware will fit the work to which it is to be attached.

.2 Check all shop drawings and frame and door lists affecting hardware type and installation, and certify to the correctness thereof, or advise the hardware supplier and Consultant in writing of required revisions.

3.3 Templates

.1 Check the hardware schedule, drawings and specifications, and furnish promptly to the applicable trades any patterns, templates, template information and manufacturer's literature required for the proper preparation for and application of hardware, in ample time to facilitate the progress of the work.

3.4 Installation

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

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

.3 Mounting Heights: Install door hardware at heights indicated in the following applicable publications unless; specifically indicated or required by local governing regulations, requirements to match for special templates, necessary coordination with door elevations, and or to ensure consistency with pairs of doors.
- .1 DHI's "Recommended Locations for Architectural Hardware for Standard Steel Doors and Frames"
- .2 DHI's "Recommended Locations for Architectural Hardware for Wood Flush Doors"
- .3 ANSI/ICC A117.1 Accessibility Guidelines for Buildings and Facilities
- .4 NWWDA
- .5 AODA

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

.5 Coordinate installation of electric door strikes, keypad locks, card readers, washroom duress systems, and other electronic door control and security devices with Electrical contractor including supply and installation of wiring and all terminations.

.6 All hardware shall be installed by carpenters, skilled in the application of architectural hardware and satisfactory to the hardware supplier. Refer to Section 06 20 00 - Finish Carpentry. Instruction sheets, details and templates shall be read and understood before installation.

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

.8 Use only manufacturer's supplied fasteners. Failure to comply may void manufacturer's warranties and applicable licensed labels. Use of "quick" type fasteners, unless specifically supplied by manufacturer, is unacceptable.

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

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

.11 After installation, templates, installation instructions and details shall be put in a file and turned over to the Owner, when building is Substantially Performed.

3.5 Field Quality Control

.1 The Contractor shall be solely responsible for and have control over construction means, methods, techniques, sequences and procedures for coordinating all portions of work under the Contract, unless the Contract Documents give other specific instructions.

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

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

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

3.6 Adjusting

.1 Adjust door hardware, operators, closers and controls for optimum, smooth operating condition, safety and for weather tight closure.

.2 Lubricate hardware, operating equipment and other moving parts.

.3 Adjust door hardware to provide tight fit at contact points with frames.

3.7 Demonstration

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

3.8 Cleaning

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

.2 Perform cleaning after installation to remove construction and accumulated environmental dirt.

.3 Clean hardware with damp rag and approved non-abrasive cleaner, and polish hardware in accordance with manufacturer's instructions.

.4 Remove protective material from hardware items where present.

End of Section

2090 Shirley Drive Kitchener Ontario N2B 0A3
Phone: (519) 578.1000 Toll Free: (800) 265.8959 Fax: (519) 578.3262

Schedule of Finish Hardware

ARCHITECT/DESIGNER: BARRY BRYAN ASSOCIATES
250 WATER ST.
WHITBY ON L1N 0G5
PHONE - 905-666-5252
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CONTRACTOR:

PHONE -
FAX -

PROJECT: ST LOUIS PHASE II
80 YOUNG STREET
KITCHENER
5074

PROJECT CONSULTANT: SIMON HANSON

PREPARED: November 11, 2021

REVISED: November 11, 2021 SUBMITTAL

Scan to check out our website

www.knells.ca

DOOR INDEX

Mark	Heading #	Mark	Heading #	Mark	Heading #
ST02B	ST02B	102	102	114	114
B001	B001	103A	103A	115	115
B002	B002	103B	103B	115A	115A
B003	B003	103C	103C	116	116
B004	B004	104	104	117	117
B005	B005	105	105	118	118
B005A	B005A	106	106	118A	118A
B008	B008	107	107	118B	118B
B008A	B008A	107A	107A	119A	119A
B009	B009	108	108	119B	119B
B010	B010	109	109	120	120
B011	B011	109A	109A	123	123
V01A	V01A	110	110	ST01.2	ST01.2
ST01.1	ST01.1	111	111	ST02.2	ST02.2
ST02.1	ST02.1	112	112	ST03.2	ST03.2
ST03.1	ST03.1	112A	112A	ST04.2	ST04.2
ST04.1	ST04.1	112B.1	112B.1	C201	C201
C103	C103	112B.2	112B.2	201	201
C104	C104	112D	112D	202	202
L101	L101	112E	112E	203	203
101G	101G	113	113	204A	204A

DOOR INDEX

Mark	Heading #	Mark	Heading #	Mark	Heading #
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205	205	221A	221A	309A	309A
206	206	221B	221B	309B	309B
207	207	222	222	309C	309C
208	208	223	223	309D	309D
209A	209A	224	224	310A	310A
209B	209B	224A	224A	310B	310B
209C	209C	225	225	311	311
210	210	ST01.3	ST01.3	312	312
211	211	ST02.3	ST02.3	313	313
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218	218	304	304	320	320
219	219	305	305	321A	321A
220	220	305A	305A	321B	321B
220A	220A	306	306	321C	321C
220B	220B	307	307	321D	321D

DOOR INDEX

Mark	Heading #	Mark	Heading #	Mark	Heading #
321E	321E				
322	322				
ST03.4	ST03.4				
402	402				
402A	402A				
403	403				

Hardware Finishes

Finish	Description
26D	SATIN CHROMIUM PLATED
626	SATIN CHROMIUM PLATED
630	SATIN STAINLESS STEEL
689	POWDER COAT, ALUMINUM
ALUMINUM	ALUMINUM
C.A.	CLEAR ANODIZED
C26D	SATIN CHROMIUM
C32D	STAINLESS STEEL, SATIN
PC	PRIME COAT
US26D	SATIN CHROMIUM PLATED
US32D	SATIN STAINLESS STEEL

HARDWARE SCHEDULE - CODE # 5074

ST LOUIS PHASE II

80 YOUNG STREET

Heading # 101G

1 SGL DOOR 101G CORRIDOR 127 TO ADMIN AREA 90º LH

914 x 2134 x 44 WD Door/ EXST Frame 20 MIN Door/20 MIN Frame

3	HINGE, 4 1/2, STD WT	FBB248 114MM	26D	STA
1	STOREROOM LOCK	175F X KA X [E7]	26D	MRK
1	CYLINDER	20J200V1-26-DQM (AB,F)	626	G&A
1	KICK PLATE	GSH 80A X 2-SIDED TAPE X 203MM X 874MM	C32D	GAL
1	FLOOR STOP	GSH 209	C26D	GAL

Heading # 102

1 SGL DOOR 102 CORRIDOR TO SCIENCE ROOM 102 90º RH

914 x 2134 x 44 WD Door/ EXST Frame 20 MIN Door/20 MIN Frame

3	HINGE, 4 1/2, STD WT	FBB248 114MM	26D	STA
1	INTRUDER LOCKSET	195DB X KD	26D	MRK
2	CYLINDER	20J200V0-26-DQM (DB,S)	626	G&A
1	OVERHEAD STOP	904S	US32D	GLY
1	CLOSER	4040XP.RWPA.689	689	LCN
1	KICK PLATE	GSH 80A X 2-SIDED TAPE X 203MM X 874MM	C32D	GAL

Heading # 103A

1 SGL DOOR 103A CORRIDOR TO SALON 90º RH

914 x 2134 x 44 WD Door/ EXST Frame 20 MIN Door/20 MIN Frame

3	HINGE, 4 1/2, STD WT	FBB248 114MM	26D	STA
1	INTRUDER LOCKSET	195DB X KD	26D	MRK
2	CYLINDER	20J200V0-26-DQM (DB,S)	626	G&A
1	KICK PLATE	GSH 80A X 2-SIDED TAPE X 203MM X 874MM	C32D	GAL
1	FLOOR STOP	GSH 209	C26D	GAL

HARDWARE SCHEDULE - CODE # 5074

ST LOUIS PHASE II

80 YOUNG STREET

Heading # 103B

1 PR DOORS 103B CORRIDOR TO SALON — 90º LHA

915/915 x 2134 x 44 WD Door/ EXST Frame — 20 MIN Door/20 MIN Frame

6	HINGE, 4 1/2, STD WT	MPB79 114MM X 102MM	26D	MCK
1	SURFACE BOLT	GSH 70 T/B	C26D	GAL
1	STOREROOM LOCK	175F X KA X [E7]	26D	MRK
1	CYLINDER	20J200V1-26-DQM (AB,F)	626	G&A
1	OVERHEAD STOP	904S	US32D	GLY
1	CLOSER	4040XP.RWPA.689	689	LCN
2	KICK PLATE	GSH 80A X 2-SIDED TAPE X 203MM X 874MM	C32D	GAL

Heading # 103C

1 SGL DOOR 103C SALON TO STORAGE — 90º RH

965 x 2134 x 44 WD Door/ HMF Frame — NON-RTD Door/NON-RTD Frame

3	HINGE, 4 1/2, STD WT	MPB79 114MM X 102MM	26D	MCK
1	CLASSROOM LOCKSET	175S X G3 X [E7]	26D	MRK
1	CYLINDER	20J200V0-26-DQM (DB,S)	626	G&A
1	OVERHEAD STOP	904S	US32D	GLY
1	KICK PLATE	GSH 80A X 2-SIDED TAPE X 203MM X 925MM	C32D	GAL

Heading # 104

1 SGL DOOR 104 CORRIDOR TO MENS WR 104 — 90º RH

914 x 2134 x 44 WD Door/ EXST Frame — NON-RTD Door/NON-RTD Frame

3	HINGE, 4 1/2, STD WT	FBB248 114MM	26D	STA
1	CLASSROOM DEADBOLT	B663J X 12-631 X 10-094	626	SCH
1	CYLINDER	20J009S4-26-DQM	26D	MED
1	PUSH PLATE	GSH 81A X 2-SIDED TAPE X 127MM X 508MM	C32D	GAL
1	PULL	GSH 1180-2 X THROUGH BOLT MOUNTING	C32D	GAL
1	KICK PLATE	GSH 80A X 2-SIDED TAPE X 203MM X 874MM	C32D	GAL
1	CLOSER	4040XP.RWPA.689	689	LCN
1	WALL STOP	GSH 240	C26D	GAL

HARDWARE SCHEDULE - CODE # 5074

ST LOUIS PHASE II

80 YOUNG STREET

Heading # 105

1 SGL DOOR 105 CORRIDOR TO UNIVERSAL WR 105 — 90º LH

965 x 2134 x 44 WD Door/ HMF Frame — NON-RTD Door/NON-RTD Frame

3	HINGE, 4 1/2, STD WT	MPB79 114MM X 102MM	26D	MCK
1	STOREROOM LOCK	175F X KA X [E7]	26D	MRK
1	CYLINDER	20J200V1-26-DQM (AB,F)	626	G&A
1	ELECTRIC STRIKE	5000C-12/24D-630	630	HES
1	AUTO OPERATOR	MICOM KIT 18137 PREM UNIV WASH (SW800 ADO, AURA & EMERG CALL-INSTALLED)		G&A
1	KICK PLATE	GSH 80A X 2-SIDED TAPE X 203MM X 925MM	C32D	GAL
1	WALL STOP	GSH 240	C26D	GAL

110VAC TO HEADER, ALL CONDUIT AND PULL STRINGS BY OTHERS.

Heading # 106

1 SGL DOOR 106 CORRIDOR TO STAFF WR 106 — 90º RH

865 x 2134 x 44 WD Door/ HMF Frame — NON-RTD Door/NON-RTD Frame

3	HINGE, 4 1/2, STD WT	MPB79 114MM X 102MM	26D	MCK
1	STOREROOM LOCK	175F X KA X [E7]	26D	MRK
1	CYLINDER	20J200V1-26-DQM (AB,F)	626	G&A
1	INDICATOR DEADLOCK	D271 X 30-253 X 10-094	626	FAL
1	KICK PLATE	GSH 80A X 2-SIDED TAPE X 203MM X 820MM	C32D	GAL
1	FLOOR STOP	GSH 209	C26D	GAL

Heading # 107

1 SGL DOOR 107 CORRIDOR TO STAFF WR 107 — 90º LH

865 x 2134 x 44 WD Door/ HMF Frame — NON-RTD Door/NON-RTD Frame

3	HINGE, 4 1/2, STD WT	MPB79 114MM X 102MM	26D	MCK
1	STOREROOM LOCK	175F X KA X [E7]	26D	MRK
1	CYLINDER	20J200V1-26-DQM (AB,F)	626	G&A
1	INDICATOR DEADLOCK	D271 X 30-253 X 10-094	626	FAL
1	KICK PLATE	GSH 80A X 2-SIDED TAPE X 203MM X 820MM	C32D	GAL
1	FLOOR STOP	GSH 209	C26D	GAL

HARDWARE SCHEDULE - CODE # 5074

ST LOUIS PHASE II

80 YOUNG STREET

Heading # 107A

1 SGL DOOR 107A STAFF WR 107 TO CLOSET 107A — 90º LH

865 x 2134 x 44 WD Door/ HMF Frame — NON-RTD Door/NON-RTD Frame

3	HINGE, 4 1/2, STD WT	MPB79 114MM X 102MM	26D	MCK
1	STOREROOM LOCK	175F X KA X [E7]	26D	MRK
1	CYLINDER	20J200V1-26-DQM (AB,F)	626	G&A
1	CLOSER	4040XP.RWPA.689	689	LCN
1	FLOOR STOP	GSH 209	C26D	GAL

Heading # 108

1 SGL DOOR 108 CORRIDOR C102 TO WOMENS WR 108 — 90º LH

914 x 2134 x 44 WD Door/ EXST Frame — NON-RTD Door/NON-RTD Frame

3	HINGE, 4 1/2, STD WT	FBB248 114MM	26D	STA
1	CLASSROOM DEADBOLT	B663J X 12-631 X 10-094	626	SCH
1	CYLINDER	20J009S4-26-DQM	26D	MED
1	PUSH PLATE	GSH 81A X 2-SIDED TAPE X 127MM X 508MM	C32D	GAL
1	PULL	GSH 1180-2 X THROUGH BOLT MOUNTING	C32D	GAL
1	KICK PLATE	GSH 80A X 2-SIDED TAPE X 203MM X 874MM	C32D	GAL
1	CLOSER	4040XP.RWPA.689	689	LCN

Heading # 109

1 SGL DOOR 109 CORRIDOR C102 TO HR ASSIST 109 — 90º LH

914 x 2134 x 44 WD Door/ HMF Frame — 20 MIN Door/20 MIN Frame

3	HINGE, 4 1/2, STD WT	FBB248 114MM	26D	STA
1	OFFICE LOCK	175AB X KD X [E7]	26D	MRK
1	CYLINDER	20J200V1-26-DQM (AB,F)	626	G&A
1	KICK PLATE	GSH 80A X 2-SIDED TAPE X 203MM X 874MM	C32D	GAL
1	FLOOR STOP	GSH 209	C26D	GAL

HARDWARE SCHEDULE - CODE # 5074

ST LOUIS PHASE II

80 YOUNG STREET

Heading # 109A

1 SGL DOOR 109A HR ASSIST 109 TO HR OFFICE 109A — 90º LH

914 x 2134 x 44 WD Door/ EXST Frame — NON-RTD Door/NON-RTD Frame

3	HINGE, 4 1/2, STD WT	MPB79 114MM X 102MM	26D	MCK
1	OFFICE LOCK	175AB X KD X [E7]	26D	MRK
1	CYLINDER	20J200V1-26-DQM (AB,F)	626	G&A
1	FLOOR STOP	GSH 209	C26D	GAL

Heading # 110

1 SGL DOOR 110 CORRIDOR TO CLASSROOM 110 — 90º RH

914 x 2134 x 44 WD Door/ EXST Frame — 20 MIN Door/20 MIN Frame

3	HINGE, 4 1/2, STD WT	FBB248 114MM	26D	STA
1	INTRUDER LOCKSET	195DB X KD	26D	MRK
2	CYLINDER	20J200V0-26-DQM (DB,S)	626	G&A
1	CLOSER	4040XP.RWPA.689	689	LCN
1	KICK PLATE	GSH 80A X 2-SIDED TAPE X 203MM X 874MM	C32D	GAL
1	FLOOR STOP	GSH 209	C26D	GAL

Heading # 111

1 SGL DOOR 111 CORRIDOR C103 TO COMPUTER TECHNICIANS 111 — 90º RH

914 x 2134 x 44 WD Door/ EXST Frame — NON-RTD Door/NON-RTD Frame

3	HINGE, 4 1/2, STD WT	MPB79 114MM X 102MM	26D	MCK
1	INTRUDER LOCKSET	195DB X KD	26D	MRK
2	CYLINDER	20J200V0-26-DQM (DB,S)	626	G&A
1	CLOSER	4040XP.RWPA.689	689	LCN
1	KICK PLATE	GSH 80A X 2-SIDED TAPE X 203MM X 874MM	C32D	GAL
1	FLOOR STOP	GSH 209	C26D	GAL

Heading # 112

1 SGL DOOR 112 EXTERIOR TO CAFETERIA 112 — 90º RH

914 x 2134 x 44 EXST Door/ EXST Frame — NON-RTD Door/NON-RTD Frame

1	CYLINDER	10K0403-26-7GS (KEYMARK CYLINDER FOR SARGENT EXITS)	626	G&A

REPLACE CYLINDER WITH NEW KEYMARK CYLINDER.

ST LOUIS PHASE II

80 YOUNG STREET

Heading # 112A

1 SGL DOOR 112A CAFETERIA 112 FROM CLOSET — 90º — RHR

914 x 2134 x 44 WD Door/ EXST Frame — NON-RTD Door/NON-RTD Frame

1	STOREROOM LOCK	175F X KA X [E7]	26D	MRK
1	CYLINDER	20J200V1-26-DQM (AB,F)	626	G&A

NEW LEVER ONLY.

Heading # 112B.1

1 SGL DOOR 112B.1 CAFETERIA 112 FROM TUCK SHOP 112B — 90º — LHR

914 x 2134 x 44 WD Door/ EXST Frame — NON-RTD Door/NON-RTD Frame

1	CYLINDER	20J009S4-26-DQM	26D	MED

RE-USE EXISTING HARDWARE. NEW CYLINDER ONLY.

Heading # 112B.2

1 SGL DOOR 112B.2 CAFETERIA 112 FROM TUCK SHOP 112B — 90º — RHR

914 x 2134 x 44 EXST Door/ EXST Frame — NON-RTD Door/NON-RTD Frame

1	CYLINDER	20J009S4-26-DQM	26D	MED

RE-USE EXISTING HARDWARE. NEW CYLINDER ONLY.

Heading # 112D

1 PR DOORS 112D CAFETERIA 112 FROM ELECTRICAL — 90º — LHR,RHR

915/915 x 2134 x 44 EXST Door/ EXST Frame — NON-RTD Door/NON-RTD Frame

1	STOREROOM LOCK	175F X KA X [E7]	26D	MRK
1	CYLINDER	20J200V1-26-DQM (AB,F)	626	G&A

NEW LEVER ONLY

Heading # 112E

1 SGL DOOR 112E CAFETERIA 112 FROM CLOSET 112E — 90º — LHR

914 x x EXST Door/ EXST Frame — NON-RTD Door/NON-RTD Frame

1	STOREROOM LOCK	175F X KA X [E7]	26D	MRK
1	CYLINDER	20J200V1-26-DQM (AB,F)	626	G&A

NEW LEVER ONLY.

HARDWARE SCHEDULE - CODE # 5074

ST LOUIS PHASE II

80 YOUNG STREET

Heading # 113

1 SGL DOOR 113 CORRIDOR C104 TO STORAGE — 90º — LH

914 x 2134 x 44 WD Door/ EXST Frame — 20 MIN Door/20 MIN Frame

1	CYLINDER	20J200V1-26-DQM (AB,F)	626	G&A

RE-USE EXISTING HARDWARE. NEW CYLINDER ONLY.

Heading # 114

1 SGL DOOR 114 CORRIDOR C104 FROM STAFFROOM 114 — 90º — RHR

914 x 2134 x 44 WD Door/ EXST Frame — 20 MIN Door/20 MIN Frame

1	CYLINDER	20J200V1-26-DQM (AB,F)	626	G&A

RE-USE EXISTING HARDWARE. NEW CYLINDER ONLY.

Heading # 115

1 SGL DOOR 115 LOBBY L101 TO LINC INFANT DAYCARE 115 — 90º — RH

914 x 2134 x 44 WD Door/ EXST Frame — 20 MIN Door/20 MIN Frame

3	HINGE, 4 1/2, STD WT	FBB248 114MM	26D	STA
1	INTRUDER LOCKSET	195DB X KD	26D	MRK
2	CYLINDER	20J200V0-26-DQM (DB,S)	626	G&A
1	CLOSER	4040XP.RWPA.689	689	LCN
1	KICK PLATE	GSH 80A X 2-SIDED TAPE X 203MM X 874MM	C32D	GAL
1	FLOOR STOP	GSH 209	C26D	GAL

Heading # 115A

1 SGL DOOR 115A LINC INFANT DAYCARE 115 FROM STAFFROOM 114 — 90º — LHR

914 x 2134 x 44 WD Door/ EXST Frame — NON-RTD Door/NON-RTD Frame

RE-USE EXISTING HARDWARE.

HARDWARE SCHEDULE - CODE # 5074

ST LOUIS PHASE II

80 YOUNG STREET

Heading # 116

1 SGL DOOR 116 LOBBY L101 TO STORAGE 90º RH

914 x 2134 x 44 WD Door/ EXST Frame 20 MIN Door/20 MIN Frame

3	HINGE, 4 1/2, STD WT	MPB79 114MM X 102MM	26D	MCK
1	STOREROOM LOCK	175F X KA X [E7]	26D	MRK
1	CYLINDER	20J200V1-26-DQM (AB,F)	626	G&A
1	CLOSER	4040XP.RWPA.689	689	LCN
1	KICK PLATE	GSH 80A X 2-SIDED TAPE X 203MM X 874MM	C32D	GAL

Heading # 117

1 SGL DOOR 117 LOBBY L101 TO STAFF WASHROOM 117 90º RH

914 x 2134 x 44 WD Door/ EXST Frame NON-RTD Door/NON-RTD Frame

3	HINGE, 4 1/2, STD WT	MPB79 114MM X 102MM	26D	MCK
1	STOREROOM LOCK	175F X KA X [E7]	26D	MRK
1	CYLINDER	20J200V1-26-DQM (AB,F)	626	G&A
1	INDICATOR DEADLOCK	D271 X 30-253 X 10-094	626	FAL
1	KICK PLATE	GSH 80A X 2-SIDED TAPE X 203MM X 874MM	C32D	GAL
1	FLOOR STOP	GSH 209	C26D	GAL

Heading # 118

1 SGL DOOR 118 CORRIDOR C104 TO TODDLER DAYCARE LINC PRESCHOOL 118 90º RH

914 x 2134 x 44 WD Door/ EXST Frame 20 MIN Door/20 MIN Frame

3	HINGE, 4 1/2, STD WT	FBB248 114MM	26D	STA
1	INTRUDER LOCKSET	195DB X KD	26D	MRK
2	CYLINDER	20J200V0-26-DQM (DB,S)	626	G&A
1	OVERHEAD STOP	904S	US32D	GLY
1	KICK PLATE	GSH 80A X 2-SIDED TAPE X 203MM X 874MM	C32D	GAL
1	FINGER GUARD	MK1-A (FINGER GUARD)	GREY	G&A
1	FINGER GUARD	MK1-B (FINGER GUARD)	GREY	G&A

HARDWARE SCHEDULE - CODE # 5074

ST LOUIS PHASE II

80 YOUNG STREET

Heading # 118A

1 SGL DOOR 118A TODDLER DAYCARE LINC PRESCHOOL 118 TO WASHROOM 118A — 90º — RH

914 x 2134 x 44 WD Door/ EXST Frame — NON-RTD Door/NON-RTD Frame

1	CYLINDER	20J009S4-26-DQM	26D	MED

EXISTING HARDWARE TO REMAIN. NEW CYLINDER ONLY.

Heading # 118B

1 SGL DOOR 118B TODDLER DAYCARE LINC PRESCHOOL 118 TO WASHROOM 118B — 90º — LH

914 x 2134 x 44 WD Door/ EXST Frame — NON-RTD Door/NON-RTD Frame

1	CYLINDER	20J009S4-26-DQM	26D	MED

EXISTING HARDWARE TO REMAIN. NEW CYLINDER ONLY.

Heading # 119A

1 PR DOORS 119A CORRIDOR C103 TO OYAP 119 — 90º — RHA

915/915 x 2134 x 44 WD Door/ EXST Frame — 20 MIN Door/20 MIN Frame

6	HINGE, 4 1/2, STD WT	MPB79 114MM X 102MM	26D	MCK
1	SURFACE BOLT	GSH 70 T/B	C26D	GAL
1	INTRUDER LOCKSET	195DB X KD	26D	MRK
2	CYLINDER	20J200V0-26-DQM (DB,S)	626	G&A
1	CLOSER	4040XP.RWPA.689	689	LCN
2	KICK PLATE	GSH 80A X 2-SIDED TAPE X 203MM X 874MM	C32D	GAL

Heading # 119B

1 PR DOORS 119B CAFETERIA 112 TO OYAP 119 — 90º — LHA

915/915 x 2134 x 44 EXST Door/ EXST Frame — NON-RTD Door/NON-RTD Frame

1	INSTITUTION LOCK	195DW X KD	26D	MRK
2	CYLINDER	20J200V0-26-DQM (DB,S)	626	G&A

NEW LEVER ONLY.

HARDWARE SCHEDULE - CODE # 5074

ST LOUIS PHASE II

80 YOUNG STREET

Heading # 120

1 SGL DOOR 120 CORRIDOR TO CUSTODIAL 120 — 90º LH

914 x 2134 x 44 HMD Door/ EXST Frame — 45 MIN Door/45 MIN Frame

3	HINGE, 4 1/2, STD WT	FBB248 114MM	26D	STA
1	STOREROOM LOCK	175F X KA X [E7]	26D	MRK
1	CYLINDER	20J200V1-26-DQM (AB,F)	626	G&A
1	CLOSER	4040XP.RWPA.689	689	LCN
1	KICK PLATE	GSH 80A X 2-SIDED TAPE X 203MM X 874MM	C32D	GAL

Heading # 123

1 SGL DOOR 123 VESTIBULE V01 FROM LIFT 123 — 90º LHR

x x EXST Door/ EXST Frame — NON-RTD Door/NON-RTD Frame

1	PASSAGE SET	175N X [E7]	26D	MRK

NEW LEVER ONLY.

Heading # 201

1 SGL DOOR 201 CORRIDOR C202 TO CLASSROOM 201 — 90º LH

914 x 2134 x 44 WD Door/ EXST Frame — 20 MIN Door/20 MIN Frame

3	HINGE, 4 1/2, STD WT	FBB248 114MM	26D	STA
1	INTRUDER LOCKSET	195DB X KD	26D	MRK
2	CYLINDER	20J200V0-26-DQM (DB,S)	626	G&A
1	FLOOR STOP	GSH 209	C26D	GAL

Heading # 202

1 SGL DOOR 202 CORRIDOR C202 TO CLASSROOM 202 — 90º RH

914 x 2134 x 44 WD Door/ EXST Frame — 20 MIN Door/20 MIN Frame

3	HINGE, 4 1/2, STD WT	FBB248 114MM	26D	STA
1	INTRUDER LOCKSET	195DB X KD	26D	MRK
2	CYLINDER	20J200V0-26-DQM (DB,S)	626	G&A
1	FLOOR STOP	GSH 209	C26D	GAL

HARDWARE SCHEDULE - CODE # 5074

ST LOUIS PHASE II

80 YOUNG STREET

Heading # 203

1 SGL DOOR 203 CORRIDOR C202 TO CLASSROOM 203 — 90º RH

914 x 2134 x 44 WD Door/ EXST Frame — 20 MIN Door/20 MIN Frame

3	HINGE, 4 1/2, STD WT	FBB248 114MM	26D	STA
1	INTRUDER LOCKSET	195DB X KD	26D	MRK
2	CYLINDER	20J200V0-26-DQM (DB,S)	626	G&A
1	FLOOR STOP	GSH 209	C26D	GAL

Heading # 204A

1 SGL DOOR 204A CORRIDOR C202 TO CLASSROOM 204 — 90º RH

914 x 2134 x 44 WD Door/ EXST Frame — 20 MIN Door/20 MIN Frame

3	HINGE, 4 1/2, STD WT	FBB248 114MM	26D	STA
1	INTRUDER LOCKSET	195DB X KD	26D	MRK
2	CYLINDER	20J200V0-26-DQM (DB,S)	626	G&A
1	FLOOR STOP	GSH 209	C26D	GAL

Heading # 204B

1 SGL DOOR 204B CORRIDOR C202 TO CLASSROOM 204 — 90º LH

914 x 2134 x 44 WD Door/ EXST Frame — 20 MIN Door/20 MIN Frame

3	HINGE, 4 1/2, STD WT	FBB248 114MM	26D	STA
1	INTRUDER LOCKSET	195DB X KD	26D	MRK
2	CYLINDER	20J200V0-26-DQM (DB,S)	626	G&A
1	FLOOR STOP	GSH 209	C26D	GAL

Heading # 205

1 SGL DOOR 205 CORRIDOR C202 TO PRAYER ROOM — 90º LH

914 x 2134 x 44 WD Door/ EXST Frame — 20 MIN Door/20 MIN Frame

3	HINGE, 4 1/2, STD WT	FBB248 114MM	26D	STA
1	DEADLOCK	B660P X 12-631 X 10-094	626	SCH
1	CYLINDER	20J009S4-26-DQM	26D	MED

HARDWARE SCHEDULE - CODE # 5074

ST LOUIS PHASE II

80 YOUNG STREET

Heading # 206

1 SGL DOOR 206 CORRIDOR C202 TO CLASSROOM 206 — 90º RH

914 x 2134 x 44 WD Door/ EXST Frame — 20 MIN Door/20 MIN Frame

3	HINGE, 4 1/2, STD WT	FBB248 114MM	26D	STA
1	INTRUDER LOCKSET	195DB X KD	26D	MRK
2	CYLINDER	20J200V0-26-DQM (DB,S)	626	G&A
1	FLOOR STOP	GSH 209	C26D	GAL

Heading # 207

1 SGL DOOR 207 CORRIDOR TO WOMENS WR 207 — 90º RH

914 x 2134 x 44 WD Door/ EXST Frame — NON-RTD Door/NON-RTD Frame

3	HINGE, 4 1/2, STD WT	FBB248 114MM	26D	STA
1	CLASSROOM DEADBOLT	B663J X 12-631 X 10-094	626	SCH
1	CYLINDER	20J009S4-26-DQM	26D	MED
1	PUSH PLATE	GSH 81A X 2-SIDED TAPE X 127MM X 508MM	C32D	GAL
1	PULL	GSH 1180-2 X THROUGH BOLT MOUNTING	C32D	GAL
1	KICK PLATE	GSH 80A X 2-SIDED TAPE X 203MM X 874MM	C32D	GAL
1	CLOSER	4040XP.RWPA.689	689	LCN

Heading # 208

1 SGL DOOR 208 CORRIDOR TO CUSTODIAL 208 — 90º LH

914 x 2134 x 44 HMD Door/ EXST Frame — 45 MIN Door/45 MIN Frame

3	HINGE, 4 1/2, STD WT	FBB248 114MM	26D	STA
1	STOREROOM LOCK	175F X KA X [E7]	26D	MRK
1	CYLINDER	20J200V1-26-DQM (AB,F)	626	G&A
1	CLOSER	4040XP.RWPA.689	689	LCN
1	KICK PLATE	GSH 80A X 2-SIDED TAPE X 203MM X 874MM	C32D	GAL

HARDWARE SCHEDULE - CODE # 5074

ST LOUIS PHASE II

80 YOUNG STREET

Heading # 209A

1 SGL DOOR 209A CORRIDOR C202 FROM DAYCARE 209 — 90º RHR

914 x 2134 x 44 WD Door/ EXST Frame — 20 MIN Door/20 MIN Frame

3	HINGE, 4 1/2, STD WT	FBB248 114MM	26D	STA
1	INTRUDER LOCKSET	195DB X KD	26D	MRK
2	CYLINDER	20J200V0-26-DQM (DB,S)	626	G&A
1	OVERHEAD STOP	904S	US32D	GLY
1	KICK PLATE	GSH 80A X 2-SIDED TAPE X 203MM X 874MM	C32D	GAL
1	FINGER GUARD	MK1-A (FINGER GUARD)	GREY	G&A
1	FINGER GUARD	MK1-B (FINGER GUARD)	GREY	G&A

Heading # 209B

1 PR DOORS 209B CORRIDOR C202 FROM DAYCARE 209 — 90º RHRA

915/915 x 2134 x 44 WD Door/ EXST Frame — 20 MIN Door/20 MIN Frame

6	HINGE, 4 1/2, STD WT	MPB79 114MM X 102MM	26D	MCK
1	SURFACE BOLT	GSH 70 T/B	C26D	GAL
1	STOREROOM LOCK	175F X KA X [E7]	26D	MRK
1	CYLINDER	20J200V1-26-DQM (AB,F)	626	G&A
1	CLOSER	4040XP.RWPA.689	689	LCN
1	KICK PLATE	GSH 80A X 2-SIDED TAPE X 203MM X 874MM	C32D	GAL
2	FINGER GUARD	MK1-A (FINGER GUARD)	GREY	G&A
2	FINGER GUARD	MK1-B (FINGER GUARD)	GREY	G&A

Heading # 209C

1 SGL DOOR 209C DAYCARE 209 FROM DAYCARE WASHROOM — 90º LHR

914 x 2134 x 44 EXST Door/ EXST Frame — NON-RTD Door/NON-RTD Frame

1	PASSAGE SET	175N X [E7]	26D	MRK

NEW LEVER ONLY.

HARDWARE SCHEDULE - CODE # 5074

ST LOUIS PHASE II

80 YOUNG STREET

Heading # 210

1 SGL DOOR 210 CORRIDOR C203 TO LINC COMPUTERS 210 — 90º RH

914 x 2134 x 44 WD Door/ EXST Frame — 20 MIN Door/20 MIN Frame

3	HINGE, 4 1/2, STD WT	FBB248 114MM	26D	STA
1	INTRUDER LOCKSET	195DB X KD	26D	MRK
2	CYLINDER	20J200V0-26-DQM (DB,S)	626	G&A
1	OVERHEAD STOP	904S	US32D	GLY
1	KICK PLATE	GSH 80A X 2-SIDED TAPE X 203MM X 874MM	C32D	GAL

Heading # 211

1 SGL DOOR 211 CORRIDOR TO WASHROOM 211 — 90º RH

914 x 2134 x 44 WD Door/ EXST Frame — NON-RTD Door/NON-RTD Frame

3	HINGE, 4 1/2, STD WT	FBB248 114MM	26D	STA
1	CLASSROOM DEADBOLT	B663J X 12-631 X 10-094	626	SCH
1	CYLINDER	20J009S4-26-DQM	26D	MED
1	PUSH PLATE	GSH 81A X 2-SIDED TAPE X 127MM X 508MM	C32D	GAL
1	PULL	GSH 1180-2 X THROUGH BOLT MOUNTING	C32D	GAL
1	KICK PLATE	GSH 80A X 2-SIDED TAPE X 203MM X 874MM	C32D	GAL
1	CLOSER	4040XP.RWPA.689	689	LCN
1	WALL STOP	GSH 240	C26D	GAL

Heading # 212

1 SGL DOOR 212 CORRIDOR TO JANITOR 212 — 90º RH

914 x 2134 x 44 HMD Door/ EXST Frame — 45 MIN Door/45 MIN Frame

3	HINGE, 4 1/2, STD WT	FBB248 114MM	26D	STA
1	STOREROOM LOCK	175F X KA X [E7]	26D	MRK
1	CYLINDER	20J200V1-26-DQM (AB,F)	626	G&A
1	CLOSER	4040XP.RWPA.689	689	LCN
1	KICK PLATE	GSH 80A X 2-SIDED TAPE X 203MM X 874MM	C32D	GAL

HARDWARE SCHEDULE - CODE # 5074

ST LOUIS PHASE II

80 YOUNG STREET

Heading # 213

1 SGL DOOR 213 CORRIDOR C203 TO LINC CLASSROOM 213 — 90º RH

914 x 2134 x 44 WD Door/ EXST Frame — 20 MIN Door/20 MIN Frame

3	HINGE, 4 1/2, STD WT	FBB248 114MM	26D	STA
1	INTRUDER LOCKSET	195DB X KD	26D	MRK
2	CYLINDER	20J200V0-26-DQM (DB,S)	626	G&A
1	KICK PLATE	GSH 80A X 2-SIDED TAPE X 203MM X 874MM	C32D	GAL

Heading # 214

1 SGL DOOR 214 CORRIDOR C203 TO LINC CLASSROOM 214 — 90º RH

914 x 2134 x 44 WD Door/ EXST Frame — 20 MIN Door/20 MIN Frame

3	HINGE, 4 1/2, STD WT	FBB248 114MM	26D	STA
1	INTRUDER LOCKSET	195DB X KD	26D	MRK
2	CYLINDER	20J200V0-26-DQM (DB,S)	626	G&A
1	KICK PLATE	GSH 80A X 2-SIDED TAPE X 203MM X 874MM	C32D	GAL

Heading # 215

1 SGL DOOR 215 CORRIDOR C203 TO LINC CLASSROOM 215 — 90º RH

914 x 2134 x 44 WD Door/ EXST Frame — 20 MIN Door/20 MIN Frame

3	HINGE, 4 1/2, STD WT	FBB248 114MM	26D	STA
1	INTRUDER LOCKSET	195DB X KD	26D	MRK
2	CYLINDER	20J200V0-26-DQM (DB,S)	626	G&A
1	KICK PLATE	GSH 80A X 2-SIDED TAPE X 203MM X 874MM	C32D	GAL

Heading # 216

1 SGL DOOR 216 CORRIDOR C203 TO LINC OFFICE — 90º LH

914 x 2134 x 44 WD Door/ EXST Frame — 20 MIN Door/20 MIN Frame

3	HINGE, 4 1/2, STD WT	FBB248 114MM	26D	STA
1	OFFICE LOCK	175AB X KD X [E7]	26D	MRK
1	CYLINDER	20J200V1-26-DQM (AB,F)	626	G&A
1	KICK PLATE	GSH 80A X 2-SIDED TAPE X 203MM X 874MM	C32D	GAL

ST LOUIS PHASE II

80 YOUNG STREET

Heading # 217

1 SGL DOOR 217 CORRIDOR C203 TO LINC CLASSROOM 217 — 90º RH

914 x 2134 x 44 WD Door/ EXST Frame — 20 MIN Door/20 MIN Frame

3	HINGE, 4 1/2, STD WT	FBB248 114MM	26D	STA
1	INTRUDER LOCKSET	195DB X KD	26D	MRK
2	CYLINDER	20J200V0-26-DQM (DB,S)	626	G&A
1	KICK PLATE	GSH 80A X 2-SIDED TAPE X 203MM X 874MM	C32D	GAL

Heading # 218

1 SGL DOOR 218 CORRIDOR C203 TO LINC OFFICE 218 — 90º LH

914 x 2134 x 44 WD Door/ EXST Frame — 20 MIN Door/20 MIN Frame

3	HINGE, 4 1/2, STD WT	FBB248 114MM	26D	STA
1	OFFICE LOCK	175AB X KD X [E7]	26D	MRK
1	CYLINDER	20J200V1-26-DQM (AB,F)	626	G&A
1	KICK PLATE	GSH 80A X 2-SIDED TAPE X 203MM X 874MM	C32D	GAL

Heading # 219

1 SGL DOOR 219 CORRIDOR C203 TO LINC CLASSROOM 219 — 90º RH

914 x 2134 x 44 WD Door/ EXST Frame — 20 MIN Door/20 MIN Frame

3	HINGE, 4 1/2, STD WT	FBB248 114MM	26D	STA
1	INTRUDER LOCKSET	195DB X KD	26D	MRK
2	CYLINDER	20J200V0-26-DQM (DB,S)	626	G&A
1	KICK PLATE	GSH 80A X 2-SIDED TAPE X 203MM X 874MM	C32D	GAL

Heading # 220

1 SGL DOOR 220 CORRIDOR C203 TO STAFF LOUNGE — 90º RH

914 x 2134 x 44 WD Door/ EXST Frame — 20 MIN Door/20 MIN Frame

3	HINGE, 4 1/2, STD WT	FBB248 114MM	26D	STA
1	STOREROOM LOCK	175F X KA X [E7]	26D	MRK
1	CYLINDER	20J200V1-26-DQM (AB,F)	626	G&A
1	CLOSER	4040XP.RWPA.689	689	LCN
1	KICK PLATE	GSH 80A X 2-SIDED TAPE X 203MM X 874MM	C32D	GAL

HARDWARE SCHEDULE - CODE # 5074

ST LOUIS PHASE II

80 YOUNG STREET

Heading # 220A

1 SGL DOOR 220A STAFF LOUNGE TO STAFF WR 220A — 90º LH

762 x 2134 x 44 WD Door/ EXST Frame — NON-RTD Door/NON-RTD Frame

3	HINGE, 4 1/2, STD WT	MPB79 114MM X 102MM	26D	MCK
1	PRIVACY SET	175L X [E7]	26D	MRK
1	FLOOR STOP	GSH 209	C26D	GAL

Heading # 220B

1 SGL DOOR 220B STAFF LOUNGE FROM CLOSET — 90º LHR

914 x 2134 x 44 WD Door/ EXST Frame — NON-RTD Door/NON-RTD Frame

3	HINGE, 4 1/2, STD WT	MPB79 114MM X 102MM	26D	MCK
1	PASSAGE SET	175N X [E7]	26D	MRK

Heading # 221

1 SGL DOOR 221 CORRIDOR C203 TO STAFF LOUNGE 221 — 90º LH

914 x 2134 x 44 WD Door/ EXST Frame — 20 MIN Door/20 MIN Frame

3	HINGE, 4 1/2, STD WT	FBB248 114MM	26D	STA
1	OFFICE LOCK	175AB X KD X [E7]	26D	MRK
1	CYLINDER	20J200V1-26-DQM (AB,F)	626	G&A
1	KICK PLATE	GSH 80A X 2-SIDED TAPE X 203MM X 874MM	C32D	GAL

Heading # 221A

1 SGL DOOR 221A STAFF LOUNGE 221 TO STAFF WR 221A — 90º LH

762 x 2134 x 44 WD Door/ EXST Frame — NON-RTD Door/NON-RTD Frame

3	HINGE, 4 1/2, STD WT	MPB79 114MM X 102MM	26D	MCK
1	PRIVACY SET	175L X [E7]	26D	MRK
1	FLOOR STOP	GSH 209	C26D	GAL

HARDWARE SCHEDULE - CODE # 5074

ST LOUIS PHASE II

80 YOUNG STREET

Heading # 221B

1 SGL DOOR 221B STAFF LOUNGE 221 TO STAFF LOUNGE 220 — 90º LH

914 x 2134 x 44 WD Door/ EXST Frame — NON-RTD Door/NON-RTD Frame

3	HINGE, 4 1/2, STD WT	FBB248 114MM	26D	STA
1	PASSAGE SET	175N X [E7]	26D	MRK
1	KICK PLATE	GSH 80A X 2-SIDED TAPE X 203MM X 874MM	C32D	GAL

Heading # 222

1 SGL DOOR 222 CORRIDOR C203 TO STORAGE 222 — 90º LH

914 x 2134 x 44 WD Door/ EXST Frame — 20 MIN Door/20 MIN Frame

3	HINGE, 4 1/2, STD WT	FBB248 114MM	26D	STA
1	STOREROOM LOCK	175F X KA X [E7]	26D	MRK
1	CYLINDER	20J200V1-26-DQM (AB,F)	626	G&A
1	CLOSER	4040XP.RWPA.689	689	LCN
1	KICK PLATE	GSH 80A X 2-SIDED TAPE X 203MM X 874MM	C32D	GAL

Heading # 223

1 PR DOORS 223 CORRIDOR C202 TO FOOD SERVICES 223 — 90º

915/915 x 2134 x 44 WD Door/ EXST Frame — 20 MIN Door/20 MIN Frame

6	HINGE, 4 1/2, STD WT	FBB248 114MM	26D	STA
1	SURFACE BOLT	GSH 70 T/B	C26D	GAL
1	STOREROOM LOCK	175F X KA X [E7]	26D	MRK
1	CYLINDER	20J200V1-26-DQM (AB,F)	626	G&A
1	CLOSER	4040XP.RWPA.689	689	LCN
2	KICK PLATE	GSH 80A X 2-SIDED TAPE X 203MM X 874MM	C32D	GAL

HARDWARE SCHEDULE - CODE # 5074

ST LOUIS PHASE II

80 YOUNG STREET

Heading # 224

1 SGL DOOR 224 CORRIDOR C202 TO FOOD 224 — 90º — RH

914 x 2134 x 44 WD Door/ EXST Frame — 20 MIN Door/20 MIN Frame

3	HINGE, 4 1/2, STD WT	FBB248 114MM	26D	STA
1	INTRUDER LOCKSET	195DB X KD	26D	MRK
2	CYLINDER	20J200V0-26-DQM (DB,S)	626	G&A
1	KICK PLATE	GSH 80A X 2-SIDED TAPE X 203MM X 874MM	C32D	GAL
1	FLOOR STOP	GSH 209	C26D	GAL

Heading # 224A

1 SGL DOOR 224A FOOD SERVICES 223 TO FOOD 224 — 90º — LH

914 x 2134 x 44 WD Door/ EXST Frame — 20 MIN Door/20 MIN Frame

3	HINGE, 4 1/2, STD WT	MPB79 114MM X 102MM	26D	MCK
1	PASSAGE SET	175N X [E7]	26D	MRK
1	OVERHEAD STOP	904S	US32D	GLY
1	KICK PLATE	GSH 80A X 2-SIDED TAPE X 203MM X 874MM	C32D	GAL

Heading # 225

1 SGL DOOR 225 CORRIDOR C202 FROM LIFT 225 — 90º — LHR

914 x 2134 x 44 EXST Door/ EXST Frame — NON-RTD Door/NON-RTD Frame

1	PASSAGE SET	175N X [E7]	26D	MRK

NEW LEVER ONLY.

Heading # 301

1 SGL DOOR 301 CORRIDOR C301 TO COMPUTER 301 — 90º — RH

914 x 2134 x 44 WD Door/ EXST Frame — 20 MIN Door/20 MIN Frame

3	HINGE, 4 1/2, STD WT	FBB248 114MM	26D	STA
1	INTRUDER LOCKSET	195DB X KD	26D	MRK
2	CYLINDER	20J200V0-26-DQM (DB,S)	626	G&A
1	FLOOR STOP	GSH 209	C26D	GAL

HARDWARE SCHEDULE - CODE # 5074

ST LOUIS PHASE II

80 YOUNG STREET

Heading # 302

1 SGL DOOR 302 CORRIDOR C301 TO COMPUTER 302 — 90º RH

914 x 2134 x 44 WD Door/ EXST Frame — 20 MIN Door/20 MIN Frame

3	HINGE, 4 1/2, STD WT	FBB248 114MM	26D	STA
1	INTRUDER LOCKSET	195DB X KD	26D	MRK
2	CYLINDER	20J200V0-26-DQM (DB,S)	626	G&A
1	FLOOR STOP	GSH 209	C26D	GAL

Heading # 303

1 SGL DOOR 303 CORRIDOR C301 TO COMPUTER 303 — 90º RH

914 x 2134 x 44 WD Door/ EXST Frame — 20 MIN Door/20 MIN Frame

3	HINGE, 4 1/2, STD WT	FBB248 114MM	26D	STA
1	INTRUDER LOCKSET	195DB X KD	26D	MRK
2	CYLINDER	20J200V0-26-DQM (DB,S)	626	G&A
1	FLOOR STOP	GSH 209	C26D	GAL

Heading # 304

1 SGL DOOR 304 CORRIDOR C301 TO COMPUTER 304 — 90º RH

914 x 2134 x 44 WD Door/ EXST Frame — 20 MIN Door/20 MIN Frame

3	HINGE, 4 1/2, STD WT	FBB248 114MM	26D	STA
1	INTRUDER LOCKSET	195DB X KD	26D	MRK
2	CYLINDER	20J200V0-26-DQM (DB,S)	626	G&A
1	FLOOR STOP	GSH 209	C26D	GAL

Heading # 305

1 SGL DOOR 305 CORRIDOR C301 TO HUB ROOM 305 — 90º RH

914 x 2134 x 44 WD Door/ EXST Frame — 20 MIN Door/20 MIN Frame

3	HINGE, 4 1/2, STD WT	MPB79 114MM X 102MM	26D	MCK
1	OFFICE LOCK	175AB X KD X [E7]	26D	MRK
1	CYLINDER	20J200V1-26-DQM (AB,F)	626	G&A
1	FLOOR STOP	GSH 209	C26D	GAL

HARDWARE SCHEDULE - CODE # 5074

ST LOUIS PHASE II

80 YOUNG STREET

Heading # 305A

1 SGL DOOR 305A HUB ROOM 305 FROM SERVER 305A — 90º RHR

813 x 2134 x 44 HMD Door/ EXST Frame — NON-RTD Door/NON-RTD Frame

3	HINGE, 4 1/2, STD WT	MPB79 114MM X 102MM	26D	MCK
1	STOREROOM LOCK	175F X KA X [E7]	26D	MRK
1	CYLINDER	20J200V1-26-DQM (AB,F)	626	G&A
1	FLOOR STOP	GSH 209	C26D	GAL

Heading # 306

1 SGL DOOR 306 CORRIDOR C301 TO COMPUTER 306 — 90º RH

914 x 2134 x 44 WD Door/ EXST Frame — 20 MIN Door/20 MIN Frame

3	HINGE, 4 1/2, STD WT	FBB248 114MM	26D	STA
1	INTRUDER LOCKSET	195DB X KD	26D	MRK
2	CYLINDER	20J200V0-26-DQM (DB,S)	626	G&A
1	FLOOR STOP	GSH 209	C26D	GAL

Heading # 307

1 SGL DOOR 307 CORRIDOR C302 TO MENS WR 307 — 90º LH

914 x 2134 x 44 WD Door/ EXST Frame — NON-RTD Door/NON-RTD Frame

3	HINGE, 4 1/2, STD WT	FBB248 114MM	26D	STA
1	CLASSROOM DEADBOLT	B663J X 12-631 X 10-094	626	SCH
1	CYLINDER	20J009S4-26-DQM	26D	MED
1	PUSH PLATE	GSH 81A X 2-SIDED TAPE X 127MM X 508MM	C32D	GAL
1	PULL	GSH 1180-2 X THROUGH BOLT MOUNTING	C32D	GAL
1	KICK PLATE	GSH 80A X 2-SIDED TAPE X 203MM X 874MM	C32D	GAL
1	CLOSER	4040XP.RWPA.689	689	LCN
1	WALL STOP	GSH 240	C26D	GAL

HARDWARE SCHEDULE - CODE # 5074

ST LOUIS PHASE II

80 YOUNG STREET

Heading # 308

1 SGL DOOR 308 CORRIDOR C302 TO WOMENS WR 308 — 90º LH

914 x 2134 x 44 WD Door/ EXST Frame — NON-RTD Door/NON-RTD Frame

3	HINGE, 4 1/2, STD WT	FBB248 114MM	26D	STA
1	CLASSROOM DEADBOLT	B663J X 12-631 X 10-094	626	SCH
1	CYLINDER	20J009S4-26-DQM	26D	MED
1	PUSH PLATE	GSH 81A X 2-SIDED TAPE X 127MM X 508MM	C32D	GAL
1	PULL	GSH 1180-2 X THROUGH BOLT MOUNTING	C32D	GAL
1	KICK PLATE	GSH 80A X 2-SIDED TAPE X 203MM X 874MM	C32D	GAL
1	CLOSER	4040XP.RWPA.689	689	LCN
1	FLOOR STOP	GSH 209	C26D	GAL

Heading # 309A

1 SGL DOOR 309A CORRIDOR C302 TO PSW OFFICE 309 — 90º LH

914 x 2134 x 44 WD Door/ EXST Frame — 20 MIN Door/20 MIN Frame

3	HINGE, 4 1/2, STD WT	FBB248 114MM	26D	STA
1	OFFICE LOCK	175AB X KD X [E7]	26D	MRK
1	CYLINDER	20J200V1-26-DQM (AB,F)	626	G&A
1	KICK PLATE	GSH 80A X 2-SIDED TAPE X 203MM X 874MM	C32D	GAL
1	FLOOR STOP	GSH 209	C26D	GAL

Heading # 309B

1 SGL DOOR 309B PSW OFFICE 309 FROM PSW 310 — 90º LHR

914 x 2134 x 44 WD Door/ EXST Frame — NON-RTD Door/NON-RTD Frame

3	HINGE, 4 1/2, STD WT	MPB79 114MM X 102MM	26D	MCK
1	INSTITUTION LOCK	195DW X KD	26D	MRK
2	CYLINDER	20J200V0-26-DQM (DB,S)	626	G&A
1	KICK PLATE	GSH 80A X 2-SIDED TAPE X 203MM X 874MM	C32D	GAL

DOOR IS KEPT OPEN MOST OF THE TIME.
IN EVENT OF LOCKDOWN, DOOR IS ALWAYS LOCKED BOTH SIDES

ST LOUIS PHASE II

80 YOUNG STREET

Heading # 309C

1 SGL DOOR 309C PSW OFFICE 309 TO CLOSETS — 90º

914 x 2134 x 44 WD Door/ EXST Frame — NON-RTD Door/NON-RTD Frame

3	HINGE, 4 1/2, STD WT	MPB79 114MM X 102MM	26D	MCK
1	PASSAGE SET	175N X [E7]	26D	MRK

Heading # 309D

1 SGL DOOR 309D PSW OFFICE 309 TO CLOSETS — 90º

914 x 2134 x 44 WD Door/ EXST Frame — NON-RTD Door/NON-RTD Frame

3	HINGE, 4 1/2, STD WT	MPB79 114MM X 102MM	26D	MCK
1	PASSAGE SET	175N X [E7]	26D	MRK

Heading # 310A

1 SGL DOOR 310A CORRIDOR C302 TO PSW 310 — 90º RH

914 x 2134 x 44 WD Door/ EXST Frame — 20 MIN Door/20 MIN Frame

3	HINGE, 4 1/2, STD WT	FBB248 114MM	26D	STA
1	INTRUDER LOCKSET	195DB X KD	26D	MRK
2	CYLINDER	20J200V0-26-DQM (DB,S)	626	G&A
1	FLOOR STOP	GSH 209	C26D	GAL

Heading # 310B

1 SGL DOOR 310B CORRIDOR C302 TO PSW 310 — 90º LH

914 x 2134 x 44 WD Door/ EXST Frame — 20 MIN Door/20 MIN Frame

3	HINGE, 4 1/2, STD WT	FBB248 114MM	26D	STA
1	INTRUDER LOCKSET	195DB X KD	26D	MRK
2	CYLINDER	20J200V0-26-DQM (DB,S)	626	G&A
1	FLOOR STOP	GSH 209	C26D	GAL

HARDWARE SCHEDULE - CODE # 5074

ST LOUIS PHASE II

80 YOUNG STREET

Heading # 311

1 SGL DOOR 311 CORRIDOR C303 TO CLASSROOM 311 — 90º RH

914 x 2134 x 44 WD Door/ EXST Frame — 20 MIN Door/20 MIN Frame

3	HINGE, 4 1/2, STD WT	FBB248 114MM	26D	STA
1	INTRUDER LOCKSET	195DB X KD	26D	MRK
2	CYLINDER	20J200V0-26-DQM (DB,S)	626	G&A
1	FLOOR STOP	GSH 209	C26D	GAL

Heading # 312

1 SGL DOOR 312 CORRIDOR C303 TO OFFICE 312 — 90º RH

914 x 2134 x 44 WD Door/ EXST Frame — 20 MIN Door/20 MIN Frame

3	HINGE, 4 1/2, STD WT	FBB248 114MM	26D	STA
1	OFFICE LOCK	175AB X KD X [E7]	26D	MRK
1	CYLINDER	20J200V1-26-DQM (AB,F)	626	G&A
1	FLOOR STOP	GSH 209	C26D	GAL

Heading # 313

1 SGL DOOR 313 CORRIDOR C303 TO CLASSROOM 313 — 90º RH

914 x 2134 x 44 WD Door/ EXST Frame — 20 MIN Door/20 MIN Frame

3	HINGE, 4 1/2, STD WT	FBB248 114MM	26D	STA
1	INTRUDER LOCKSET	195DB X KD	26D	MRK
2	CYLINDER	20J200V0-26-DQM (DB,S)	626	G&A
1	FLOOR STOP	GSH 209	C26D	GAL

Heading # 314

1 SGL DOOR 314 CORRIDOR C303 TO CLASSROOM 314 — 90º RH

914 x 2134 x 44 WD Door/ EXST Frame — 20 MIN Door/20 MIN Frame

3	HINGE, 4 1/2, STD WT	FBB248 114MM	26D	STA
1	INTRUDER LOCKSET	195DB X KD	26D	MRK
2	CYLINDER	20J200V0-26-DQM (DB,S)	626	G&A
1	FLOOR STOP	GSH 209	C26D	GAL

HARDWARE SCHEDULE - CODE # 5074

ST LOUIS PHASE II

80 YOUNG STREET

Heading # 315

1 SGL DOOR 315 CORRIDOR C303 TO CLASSROOM 315 — 90º RH

914 x 2134 x 44 WD Door/ EXST Frame — 20 MIN Door/20 MIN Frame

3	HINGE, 4 1/2, STD WT	FBB248 114MM	26D	STA
1	INTRUDER LOCKSET	195DB X KD	26D	MRK
2	CYLINDER	20J200V0-26-DQM (DB,S)	626	G&A
1	FLOOR STOP	GSH 209	C26D	GAL

Heading # 316

1 SGL DOOR 316 CORRIDOR C303 TO CLASSROOM 316 — 90º RH

914 x 2134 x 44 WD Door/ EXST Frame — 20 MIN Door/20 MIN Frame

3	HINGE, 4 1/2, STD WT	FBB248 114MM	26D	STA
1	INTRUDER LOCKSET	195DB X KD	26D	MRK
2	CYLINDER	20J200V0-26-DQM (DB,S)	626	G&A
1	FLOOR STOP	GSH 209	C26D	GAL

Heading # 317

1 SGL DOOR 317 CORRIDOR C303 TO CLASSROOM 317 — 90º RH

914 x 2134 x 44 WD Door/ EXST Frame — 20 MIN Door/20 MIN Frame

3	HINGE, 4 1/2, STD WT	FBB248 114MM	26D	STA
1	INTRUDER LOCKSET	195DB X KD	26D	MRK
2	CYLINDER	20J200V0-26-DQM (DB,S)	626	G&A
1	FLOOR STOP	GSH 209	C26D	GAL

Heading # 318

1 SGL DOOR 318 CORRIDOR C303 TO CLASSROOM 318 — 90º RH

914 x 2134 x 44 WD Door/ EXST Frame — 20 MIN Door/20 MIN Frame

3	HINGE, 4 1/2, STD WT	FBB248 114MM	26D	STA
1	INTRUDER LOCKSET	195DB X KD	26D	MRK
2	CYLINDER	20J200V0-26-DQM (DB,S)	626	G&A
1	FLOOR STOP	GSH 209	C26D	GAL

HARDWARE SCHEDULE - CODE # 5074

ST LOUIS PHASE II

80 YOUNG STREET

Heading # 319

1 SGL DOOR 319 CORRIDOR C303 TO CLASSROOM 319 — 90º RH

914 x 2134 x 44 WD Door/ EXST Frame — 20 MIN Door/20 MIN Frame

3	HINGE, 4 1/2, STD WT	FBB248 114MM	26D	STA
1	INTRUDER LOCKSET	195DB X KD	26D	MRK
2	CYLINDER	20J200V0-26-DQM (DB,S)	626	G&A
1	FLOOR STOP	GSH 209	C26D	GAL

Heading # 320

1 SGL DOOR 320 CORRIDOR C303 TO CUSTODIAL 320 — 90º LH

914 x 2134 x 44 HMD Door/ EXST Frame — 45 MIN Door/45 MIN Frame

3	HINGE, 4 1/2, STD WT	FBB248 114MM	26D	STA
1	STOREROOM LOCK	175F X KA X [E7]	26D	MRK
1	CYLINDER	20J200V1-26-DQM (AB,F)	626	G&A
1	CLOSER	4040XP.RWPA.689	689	LCN
1	KICK PLATE	GSH 80A X 2-SIDED TAPE X 203MM X 874MM	C32D	GAL

Heading # 321A

1 SGL DOOR 321A CORRIDOR C302 TO PSW 321 — 90º RH

914 x 2134 x 44 WD Door/ EXST Frame — 20 MIN Door/20 MIN Frame

3	HINGE, 4 1/2, STD WT	FBB248 114MM	26D	STA
1	INTRUDER LOCKSET	195DB X KD	26D	MRK
2	CYLINDER	20J200V0-26-DQM (DB,S)	626	G&A
1	FLOOR STOP	GSH 209	C26D	GAL

Heading # 321B

1 SGL DOOR 321B CORRIDOR C302 TO PSW 321 — 90º RH

914 x 2134 x 44 WD Door/ EXST Frame — 20 MIN Door/20 MIN Frame

3	HINGE, 4 1/2, STD WT	FBB248 114MM	26D	STA
1	INTRUDER LOCKSET	195DB X KD	26D	MRK
2	CYLINDER	20J200V0-26-DQM (DB,S)	626	G&A
1	FLOOR STOP	GSH 209	C26D	GAL

ST LOUIS PHASE II

80 YOUNG STREET

Heading # 321C

1 SGL DOOR 321C PSW 321 TO STORAGE 321A — 90º LH

914 x 2134 x 44 EXST Door/ EXST Frame — NON-RTD Door/NON-RTD Frame

1	STOREROOM LOCK	175F X KA X [E7]	26D	MRK
1	CYLINDER	20J200V1-26-DQM (AB,F)	626	G&A

NEW LEVER ONLY.

Heading # 321D

1 SGL DOOR 321D PSW 321 TO STORAGE 321B — 90º

914 x 2134 x 44 EXST Door/ EXST Frame — NON-RTD Door/NON-RTD Frame

1	PASSAGE SET	175N X [E7]	26D	MRK

NEW LEVER ONLY

Heading # 321E

1 SGL DOOR 321E PSW 321 TO STORAGE 321C — 90º

914 x 2134 x 44 EXST Door/ EXST Frame — NON-RTD Door/NON-RTD Frame

1	PASSAGE SET	175N X [E7]	26D	MRK

NEW LEVER ONLY

Heading # 322

1 SGL DOOR 322 CORRIDOR 302 TO LIFT 322 — 90º

914 x x EXST Door/ EXST Frame — NON-RTD Door/NON-RTD Frame

1	PASSAGE SET	175N X [E7]	26D	MRK

NEW LEVER ONLY.

Heading # 402

1 SGL DOOR 402 CORRIDOR 401 FROM MECH ROOM 402 — 90º RHR

914 x 2134 x 44 EXST Door/ EXST Frame — NON-RTD Door/NON-RTD Frame

1	PASSAGE SET	175N X [E7]	26D	MRK

NEW LEVER ONLY.

ST LOUIS PHASE II

80 YOUNG STREET

Heading # 402A

1 SGL DOOR 402A ROOF FROM MECH ROOM 402 — 90º — LHR

914 x 2134 x 44 EXST Door/ EXST Frame — NON-RTD Door/NON-RTD Frame

1	ROOF LOCK	195GB X KD	26D	MRK
2	CYLINDER	20J200V0-26-DQM (DB,S)	626	G&A

NEW LEVER ONLY.

Heading # 403

1 SGL DOOR 403 CORRIDOR 401 FROM MECH ROOM 403 — 90º — RHR

914 x 2134 x 44 EXST Door/ EXST Frame — NON-RTD Door/NON-RTD Frame

1	PASSAGE SET	175N X [E7]	26D	MRK

NEW LEVER ONLY.

Heading # B001

1 SGL DOOR B001 STORAGE 001A TO STORAGE B001 — 90º — LH

914 x 2134 x 44 EXST Door/ EXST Frame — NON-RTD Door/NON-RTD Frame

1	STOREROOM LOCK	175F X KA X [E7]	26D	MRK
1	CYLINDER	20J200V1-26-DQM (AB,F)	626	G&A

NEW LEVER ONLY.

Heading # B002

1 SGL DOOR B002 STORAGE 001A FROM B002 — 90º — RHR

914 x 2134 x 44 EXST Door/ EXST Frame — NON-RTD Door/NON-RTD Frame

1	STOREROOM LOCK	175F X KA X [E7]	26D	MRK
1	CYLINDER	20J200V1-26-DQM (AB,F)	626	G&A

NEW LEVER ONLY.

Heading # B003

1 SGL DOOR B003 STORAGE 001A TO LAUNDRY B003 — 90º — LH

914 x 2134 x 44 EXST Door/ EXST Frame — NON-RTD Door/NON-RTD Frame

1	STOREROOM LOCK	175F X KA X [E7]	26D	MRK
1	CYLINDER	20J200V1-26-DQM (AB,F)	626	G&A

NEW LEVER ONLY.

HARDWARE SCHEDULE - CODE # 5074

ST LOUIS PHASE II

80 YOUNG STREET

Heading # B004

1 SGL DOOR B004 STORAGE 001A TO B004 — 90º LH

914 x 2134 x 44 EXST Door/ EXST Frame — NON-RTD Door/NON-RTD Frame

1	STOREROOM LOCK	175F X KA X [E7]	26D	MRK
1	CYLINDER	20J200V1-26-DQM (AB,F)	626	G&A

NEW LEVER ONLY.

Heading # B005

1 PR DOORS B005 CORRIDOR C001 TO MECHANICAL ROOM — 90º RHA

915/915 x 2134 x 44 EXST Door/ EXST Frame — 45 MIN Door/45 MIN Frame

1	STOREROOM LOCK	175F X KA X [E7]	26D	MRK
1	CYLINDER	20J200V1-26-DQM (AB,F)	626	G&A

NEW LEVER ONLY.

Heading # B005A

1 PR DOORS B005A EXTERIOR FROM VAULT — 90º RHRA

915/915 x 2134 x 44 HMD Door/ HMF Frame — 180MIN Door/180MIN Frame

6	HINGE, 4 1/2, STD WT	MPB79 114MM X 114MM NRP	26D	MCK
2	FLUSHBOLT	282D	US26D	HAG
1	CLOSER	4040XP.RWPA.689	689	LCN
1	WEATHER STRIPPING	W-52S X 20-4	C.A.	KNC
1	ASTRAGAL	W-8SP X 7		KNC
2	DOOR SWEEP	W-38S X 36		KNC
1	THRESHOLD	CT-39 X 72	ALUMINUM	KNC

LEVER LOCKSET BY HYDRO.

Heading # B008

1 SGL DOOR B008 STORAGE 001A TO VEST. B008 — 90º LH

914 x 2134 x 44 EXST Door/ EXST Frame — NON-RTD Door/NON-RTD Frame

1	OFFICE LOCK	175AB X KD X [E7]	26D	MRK
1	CYLINDER	20J200V1-26-DQM (AB,F)	626	G&A

NEW LEVER ONLY.

ST LOUIS PHASE II

80 YOUNG STREET

Heading # B008A

1 SGL DOOR B008A STORAGE TO STORAGE B008A — 90º — LH

914 x 2134 x 44 EXST Door/ EXST Frame — NON-RTD Door/NON-RTD Frame

1	PASSAGE SET	175N X [E7]	26D	MRK

NEW LEVER ONLY.

Heading # B009

1 SGL DOOR B009 STORAGE 001A FROM LIFT B009 — 90º — LHR

914 x 2134 x 44 EXST Door/ EXST Frame — NON-RTD Door/NON-RTD Frame

1	PASSAGE SET	175N X [E7]	26D	MRK

NEW LEVER ONLY.

Heading # B010

1 SGL DOOR B010 STORAGE 001A TO ELEVATOR MACHINE ROOM — 90º — LH

914 x 2134 x 44 EXST Door/ EXST Frame — NON-RTD Door/NON-RTD Frame

1	STOREROOM LOCK	175F X KA X [E7]	26D	MRK
1	CYLINDER	20J200V1-26-DQM (AB,F)	626	G&A

NEW LEVER ONLY.

Heading # B011

1 SGL DOOR B011 CORRIDOR 001 FROM MECH B011 — 90º — RHR

914 x 2134 x 44 EXST Door/ EXST Frame — NON-RTD Door/NON-RTD Frame

1	STOREROOM LOCK	175F X KA X [E7]	26D	MRK
1	CYLINDER	20J200V1-26-DQM (AB,F)	626	G&A

NEW LEVER ONLY.

Heading # C103

1 PR DOORS C103 CORRIDOR C103 FROM CAFETERIA 112 — 90º — LHR,RHR

915/915 x 2134 x 44 EXST Door/ EXST Frame — 45 MIN Door/45 MIN Frame

EXISTING HARDWARE TO REMAIN.

Heading # C104

1 PR DOORS C104 CORRIDOR C104 FROM CAFETERIA 112 — 90º — LHR,RHR

915/915 x 2134 x 44 HMD Door/ EXST Frame — NON-RTD Door/NON-RTD Frame

EXISTING HARDWARE TO REMAIN.

HARDWARE SCHEDULE - CODE # 5074

ST LOUIS PHASE II

80 YOUNG STREET

Heading # C201

1 PR DOORS C201 CORRIDOR C202 FROM CORRIDOR C201 — 90º — LHR,RHR

915/915 x 2134 x 44 HMD Door/ EXST Frame — 45 MIN Door/45 MIN Frame

6	HINGE, 4 1/2, STD WT	MPB79 114MM X 102MM	26D	MCK
2	SVR EXIT DEVICE KEY LOCKS/UNLOCKS CONTROL	12-8713F 914MMW X 2134MMH X ETL X 655 X 646 X KD	US32D	SAR
2	CYLINDER	10J0200-26-DQM-Z20	26	MED
2	CLOSER	4040XP.RWPA.689	689	LCN
2	KICK PLATE	GSH 80A X 2-SIDED TAPE X 203MM X 874MM	C32D	GAL

Heading # C301

1 PR DOORS C301 CORRIDOR C301 FROM CORRIDOR C302 — 90º — LHR,RHR

915/915 x 2134 x 44 EXST Door/ EXST Frame — NON-RTD Door/NON-RTD Frame

RE-USE EXISTING HARDWARE.

Heading # L101

1 PR DOORS L101 LOBBY L101 FROM CORRIDOR C104 — 90º — LHR,RHR

915/915 x 2134 x 44 HMD Door/ EXST Frame — 45 MIN Door/45 MIN Frame

6	HINGE, 4 1/2, STD WT	MPB79 114MM X 102MM	26D	MCK
2	SVR EXIT DEVICE KEY LOCKS/UNLOCKS CONTROL	12-8713F 914MMW X 2134MMH X ETL X 655 X 646 X KD	US32D	SAR
2	CYLINDER	10J0200-26-DQM-Z20	26	MED
2	CLOSER	4040XP.RWPA.689	689	LCN
2	KICK PLATE	GSH 80A X 2-SIDED TAPE X 203MM X 874MM	C32D	GAL

Heading # ST01.1

1 PR DOORS ST01.1 STAIR#1 FROM CORRIDOR 127 — 90º — LHR,RHR

915/915 x 2134 x 44 EXST Door/ EXST Frame — 45 MIN Door/45 MIN Frame

2	CYLINDER	10J0200-26-DQM-Z20	26	MED

NEW CYLINDERS ONLY.

HARDWARE SCHEDULE - CODE # 5074

ST LOUIS PHASE II

80 YOUNG STREET

Heading # ST01.2

1 PR DOORS ST01.2 STAIR#1 ST01 FROM CORRIDOR C201 90º LHR,RHR

915/915 x 2134 x 44 EXST Door/ EXST Frame 45 MIN Door/45 MIN Frame

2	CYLINDER	10J0200-26-DQM-Z20	26	MED

NEW CYLINDERS ONLY.

Heading # ST01.3

1 PR DOORS ST01.3 STAIR#1 ST01 FROM CORRIDOR C301 90º LHR,RHR

915/915 x 2134 x 44 EXST Door/ EXST Frame 45 MIN Door/45 MIN Frame

2	CYLINDER	10J0200-26-DQM-Z20	26	MED

NEW CYLINDERS ONLY.

Heading # ST02.1

1 PR DOORS ST02.1 VEST. V01 FROM STAIR#2 90º LHR,RHR

915/915 x 2134 x 44 HMD Door/ EXST Frame 45 MIN Door/45 MIN Frame

6	HINGE, 4 1/2, STD WT	MPB79 114MM X 102MM	26D	MCK
2	SVR EXIT DEVICE KEY LOCKS/UNLOCKS CONTROL	12-8713F 914MMW X 2134MMH X ETL X 655 X 646 X KD	US32D	SAR
2	CYLINDER	10J0200-26-DQM-Z20	26	MED
2	CLOSER	4040XP.RWPA.689	689	LCN
2	KICK PLATE	GSH 80A X 2-SIDED TAPE X 203MM X 874MM	C32D	GAL

Heading # ST02.2

1 PR DOORS ST02.2 STAIR#2 ST02 FROM CORRIDOR C201 90º LHR,RHR

915/915 x 2134 x 44 HMD Door/ EXST Frame 45 MIN Door/45 MIN Frame

6	HINGE, 4 1/2, STD WT	MPB79 114MM X 102MM	26D	MCK
2	SVR EXIT DEVICE KEY LOCKS/UNLOCKS CONTROL	12-8713F 914MMW X 2134MMH X ETL X 655 X 646 X KD	US32D	SAR
2	CYLINDER	10J0200-26-DQM-Z20	26	MED
2	CLOSER	4040XP.RWPA.689	689	LCN
2	KICK PLATE	GSH 80A X 2-SIDED TAPE X 203MM X 874MM	C32D	GAL

HARDWARE SCHEDULE - CODE # 5074

ST LOUIS PHASE II

80 YOUNG STREET

Heading # ST02.3

1 PR DOORS ST02.3 STAIR#2 ST02 FROM CORRIDOR C302 90º LHR,RHR

915/915 x 2134 x 44 HMD Door/ EXST Frame 45 MIN Door/45 MIN Frame

6	HINGE, 4 1/2, STD WT	MPB79 114MM X 102MM	26D	MCK
2	SVR EXIT DEVICE KEY LOCKS/UNLOCKS CONTROL	12-8713F 914MMW X 2134MMH X ETL X 655 X 646 X KD	US32D	SAR
2	CYLINDER	10J0200-26-DQM-Z20	26	MED
2	CLOSER	4040XP.RWPA.689	689	LCN
2	KICK PLATE	GSH 80A X 2-SIDED TAPE X 203MM X 874MM	C32D	GAL

Heading # ST02B

1 PR DOORS ST02B STAIRS FROM BASEMENT 90º LHR,RHR

865/865 x 2134 x 44 EXST Door/ EXST Frame 45 MIN Door/45 MIN Frame

6	HINGE, 4 1/2, STD WT	MPB79 114MM X 102MM	26D	MCK
1	MULLION	12-L980 X 96MM	PC	SAR
2	RIM EXIT DEVICE KEY LOCKS/UNLOCKS CONTROL	12-8813F 914MMW X ETL X 649 X KD	US32D	SAR
1	CYLINDER	10J0400-26-DQM	26	MED
2	CYLINDER	10J0200-26-DQM-Z20	26	MED
2	CLOSER	4040XP.RWPA.689	689	LCN
2	KICK PLATE	GSH 80A X 2-SIDED TAPE X 203MM X 925MM	C32D	GAL

Heading # ST03.1

1 PR DOORS ST03.1 STAIR#3 FROM CORRIDOR C102 90º LHR,RHR

915/915 x 2134 x 44 HMD Door/ EXST Frame 45 MIN Door/45 MIN Frame

6	HINGE, 4 1/2, STD WT	MPB79 114MM X 102MM	26D	MCK
2	SVR EXIT DEVICE KEY LOCKS/UNLOCKS CONTROL	NB-12-8713F 914MMW X 2134MMH X ETL X 646 X KD	US32D	SAR
2	CYLINDER	10J0200-26-DQM-Z20	26	MED
2	CLOSER	4040XP.RWPA.689	689	LCN
2	KICK PLATE	GSH 80A X 2-SIDED TAPE X 203MM X 874MM	C32D	GAL

HARDWARE SCHEDULE - CODE # 5074

ST LOUIS PHASE II

80 YOUNG STREET

Heading # ST03.2

1 PR DOORS ST03.2 STAIR#3 ST03 FROM CORRIDOR C203 — 90º — LHR,RHR

915/915 x 2134 x 44 HMD Door/ EXST Frame — 45 MIN Door/45 MIN Frame

6	HINGE, 4 1/2, STD WT	MPB79 114MM X 102MM	26D	MCK
2	SVR EXIT DEVICE KEY LOCKS/UNLOCKS CONTROL	12-8713F 914MMW X 2134MMH X ETL X 655 X 646 X KD	US32D	SAR
2	CYLINDER	10J0200-26-DQM-Z20	26	MED
2	CLOSER	4040XP.RWPA.689	689	LCN
2	KICK PLATE	GSH 80A X 2-SIDED TAPE X 203MM X 874MM	C32D	GAL

Heading # ST03.3

1 PR DOORS ST03.3 STAIR#3 ST03 FROM CORRIDOR C303 — 90º — LHR,RHR

915/915 x 2134 x 44 HMD Door/ EXST Frame — 45 MIN Door/45 MIN Frame

6	HINGE, 4 1/2, STD WT	MPB79 114MM X 102MM	26D	MCK
2	SVR EXIT DEVICE KEY LOCKS/UNLOCKS CONTROL	12-8713F 914MMW X 2134MMH X ETL X 655 X 646 X KD	US32D	SAR
2	CYLINDER	10J0200-26-DQM-Z20	26	MED
2	CLOSER	4040XP.RWPA.689	689	LCN
2	KICK PLATE	GSH 80A X 2-SIDED TAPE X 203MM X 874MM	C32D	GAL

Heading # ST03.4

1 PR DOORS ST03.4 STAIR#3 ST03 FROM CORRIDOR 401 — 90º — LHR,RHR

915/915 x 2134 x 44 EXST Door/ EXST Frame — 45 MIN Door/45 MIN Frame

2	CYLINDER	10J0200-26-DQM-Z20	26	MED

NEW CYLINDERS ONLY.

HARDWARE SCHEDULE - CODE # 5074

ST LOUIS PHASE II

80 YOUNG STREET

Heading # ST04.1

1 PR DOORS ST04.1 STAIR#4 FROM LOBBY L101 — 90º — LHR,RHR

915/915 x 2134 x 44 HMD Door/ EXST Frame — 45 MIN Door/45 MIN Frame

6	HINGE, 4 1/2, STD WT	MPB79 114MM X 102MM	26D	MCK
2	SVR EXIT DEVICE KEY LOCKS/UNLOCKS CONTROL	12-8713F 914MMW X 2134MMH X ETL X 655 X 646 X KD	US32D	SAR
2	CYLINDER	10J0200-26-DQM-Z20	26	MED
2	CLOSER	4040XP.RWPA.689	689	LCN
1	KICK PLATE	GSH 80A X 2-SIDED TAPE X 203MM X 874MM	C32D	GAL

Heading # ST04.2

1 PR DOORS ST04.2 STAIR#4 ST04 FROM CORRIDOR C203 — 90º — LHR,RHR

915/915 x 2134 x 44 HMD Door/ EXST Frame — 45 MIN Door/45 MIN Frame

6	HINGE, 4 1/2, STD WT	MPB79 114MM X 102MM	26D	MCK
2	SVR EXIT DEVICE KEY LOCKS/UNLOCKS CONTROL	12-8713F 914MMW X 2134MMH X ETL X 655 X 646 X KD	US32D	SAR
2	CYLINDER	10J0200-26-DQM-Z20	26	MED
2	CLOSER	4040XP.RWPA.689	689	LCN
2	KICK PLATE	GSH 80A X 2-SIDED TAPE X 203MM X 874MM	C32D	GAL

Heading # ST04.3

1 PR DOORS ST04.3 STAIR#4 ST04 FROM CORRIDOR C303 — 90º — LHR,RHR

915/915 x 2134 x 44 HMD Door/ EXST Frame — 45 MIN Door/45 MIN Frame

6	HINGE, 4 1/2, STD WT	MPB79 114MM X 102MM	26D	MCK
2	SVR EXIT DEVICE KEY LOCKS/UNLOCKS CONTROL	12-8713F 914MMW X 2134MMH X ETL X 655 X 646 X KD	US32D	SAR
2	CYLINDER	10J0200-26-DQM-Z20	26	MED
2	CLOSER	4040XP.RWPA.689	689	LCN
2	KICK PLATE	GSH 80A X 2-SIDED TAPE X 203MM X 874MM	C32D	GAL

HARDWARE SCHEDULE - CODE # 5074

ST LOUIS PHASE II

80 YOUNG STREET

Heading # V01A

1 PR DOORS V01A VEST. V01 FROM CORRIDOR C102 90º LHR,RHR

915/915 x 2134 x 44 EXST Door/ EXST Frame 45 MIN Door/45 MIN Frame

EXISTING HARDWARE TO REMAIN.

PART 1 GENERAL

1.1 General

.1 Conform to the requirements of Division 1.

1.2 Related Sections

.1 Section 07 92 00 Joint Sealants
.2 Section 08 11 00 Metal Doors and Frames
.3 Section 08 50 00 Aluminum Doors, Windows and Screens
.4 Section 08 88 13 Fire Resistant Glazing
.5 Section 10 28 10 Toilet and Bath Accessories

1.3 References

.1 ASTM International (ASTM)
  .1 ASTM C162-05 (2015) Standard Terminology of Glass and Glass Products.
  .2 ASTM C542-05(2017) Standard Specification for Lock-Strip Gaskets
  .3 ASTM C1048-18 Standard Specification for Heat-Strengthened and Fully Tempered Flat Glass
  .4 ASTM C1376-15 Standard Specification for Pyrolytic and Vacuum Deposition Coatings on Flat Glass
  .5 ASTM C1503-18 Standard Specification for Silvered Flat Glass Mirrors
  .6 ASTM D790-17 Standard Test Methods for Flexural Properties of Unreinforced and Reinforced Plastics and Electrical Insulating Materials
  .7 ASTM D1003-13 Standard Test Method for Haze and Luminous Transmittance of Transparent Plastics
  .8 ASTM D1929-16 Standard Test Method for Determining Ignition Temperature of Plastics
  .9 ASTM D2240-15e1 Standard Test Method for Rubber Property—Durometer Hardness
  .10 ASTM E84-18b Standard Test Method for Surface Burning Characteristics of Building Materials
  .11 ASTM E330/E330M-14 Standard Test Method for Structural Performance of Exterior Windows, Doors, Skylights and Curtain Walls by Uniform Static Air Pressure Difference
  .12 ASTM E1300-16 Standard Practice for Determining Load Resistance of Glass in Buildings
.2 American National Standards Institute (ANSI).
  .1 ANSI Z97.1 - American National Standard for Glazing Materials Used in Buildings - Safety Performance Specifications and Methods of Test.
.3 National Fire Protection Association
  .1 NFPA 80 Standard for Fire Doors, Fire Windows.
.4 Canadian General Standards Board (CGSB)
  .1 CAN/CGSB-12.1-17 Safety Glazing
  .2 CAN/CGSB-12.2-91 (R2017) Flat, Clear Sheet Glass.
  .3 CAN/CGSB-12.3-91 (R2017) Flat, Clear Float Glass.
  .4 CAN/CGSB-12.4-91 (R2017) Heat Absorbing Glass
  .5 CAN/CGSB-12.8-17 Insulating Glass Units
.5 CSA Group (CSA)
  .1 AAMA/WDMA/CSA 101/I.S.2/A440-11, NAFS - North American Fenestration Standard for Windows, Doors, and Skylights.
.6 Consumer Product Safety Commission
  .1 CPSC 16 CFR 1201 Safety Standard for Architectural Glazing Materials.
.7 Environmental Choice Program (ECP).
  .1 CCD-045-95 Sealants and Caulking.
.8 Flat Glass Manufacturers Association (FGMA).
  .1 FGMA Glazing Manual - 1997.

.9 Glass Association of North America (GANA)
  .1 GANA Glazing Manual 50th Anniversary Edition-2008.
  .2 GANA Laminated Glazing Reference Manual - 2009.
  .3 GANA Sealant Manual-2008.
  .4 GANA Guide to Architectural Glass (2010).
  .5 GANA/PGC International Protective Glazing Manual (2010).
.10 South Coast Air Quality Management District, California State (SCAQMD)
  .1 SCAQMD Rule 1168-03, Adhesives and Sealants Applications.
.11 Ontario Ministry of Municipal Affairs and Housing (MMAH)
  .1 Ontario Building Code
  .2 MMAH Supplementary Standard SB-10, Energy Efficiency Requirements.

1.4 Submittals

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

.2 Shop Drawings:
  .1 Submit drawings stamped and signed by professional engineer registered or licensed in Province of Ontario, Canada.

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

.4 Certificates: submit product certificates signed by manufacturer certifying materials and assemblies comply with specified performance characteristics and criteria and physical requirements.

.5 Test Reports: certified test reports showing compliance with specified performance characteristics and physical properties.

.6 Samples: Submit duplicate 300 x 300 mm size samples of glass and sealant material.

.7 Manufacturer's Instructions: Submit manufacturer's installation instructions.

.8 Provide maintenance data for glazing for incorporation into Operation and Maintenance Manual specified in Section 01 78 00 – Closeout Submittals.

1.5 Quality Assurance

.1 Perform work in accordance with FGMA Glazing Manual and Laminators Safety Glass Association Standards Manual for glazing installation methods.

.2 Installer: Company specializing in the installation of structural glazing with five years proven experience and approved by the manufacturer for installation of their products.

.3 Safety glass products shall comply with the testing requirements of CAN/CGSB-12.1, Type 1 for Laminated Glass and Type 2 for Tempered Glass.

.4 Comply with published recommendations of glass product manufacturers and organizations below, except where more stringent requirements are indicated. Refer to these publications for glazing terms not otherwise defined in this section or referenced standards.
  .1 GANA Publications
  .2 AAMA Publications
  .3 IGMA/IGMAC Publications

.5 Provide safety glass permanently marked with the company name or logo and CAN/CGSB-12.1 if the product meets categories 1 and 2, or mark as CAN/CGSB 12.1M-1 if the product meets the requirements of Category 1 only.

.6 Insulating Glass products are to be permanently marked either on spacers or at least one insulating unit component with appropriate certification label of the Insulating Glass Manufacturers Alliance (IGMA) or Insulating Glass Manufacturers Association of Canada (IGMAC)

.7 Single-source fabrication responsibility: All glass fabricated for each type shall be processed and supplied by a single fabricator.

.8 Test Reports: certified test reports showing compliance with specified performance characteristics and physical properties.

.9 Certificates: product certificates signed by manufacturer certifying materials comply with specified performance characteristics and criteria and physical requirements.

1.6 System Description

.1 Performance Requirements: Provide continuity of building enclosure vapour and air barrier using glass and glazing materials as follows:
.1 Utilize inner light of multiple light sealed units for continuity of air and vapour seal.

.2 Insulating glass units in combination with aluminum window, storefront or curtain wall framing specified elsewhere shall be designed by the supplier to comply with energy efficient requirements specified in MMAH Supplementary Standard SB-10.Submit engineered shop drawings, calculations and certificates certifying compliance with that standard.

1.7 Design Requirements

.1 Design glass, glazing channels, connections, attachments and glazing accessories to withstand loads designated by the Ontario Building Code and to accommodate all building deflections.

.2 Size glass to withstand wind loads, dead loads and positive and negative live loads acting normal to plane of glass to a design pressure of 1.2 kPa as measured in accordance with ANSI/ASTM E330.

.3 Limit glass deflection to 1/200 with full recovery of glazing materials.

.4 Glass thicknesses indicated are minimum and are for detailing only. Confirm glass thickness by analyzing project conditions, including in-service conditions and loads. Provide glass lites for various size openings in nominal thicknesses indicated but not less than required to meet performance requirements of referenced standards including energy efficiency requirements of MMAH-SB-10. Coordinate glass thicknesses with manufacturers of framing systems.

1.8 Project Conditions

.1 Install glazing when ambient temperature is 10 ° C minimum. Maintain ventilated environment for 24 hours after application.

.2 Maintain minimum ambient temperature before, during and for 24 hours after installation of glazing compounds.

1.9 Shipping, Handling and Storage

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

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

.3 Provide glass units with interleaving protection between lites. Keep glass and interleaving dry and store cases in clean, cool, dry areas with temperatures above the dew point. Circulation of cool, dry air in storage areas is essential. Open cases and inspect units periodically for moisture accumulation.

.4 Do not store glass in direct sunlight without an opaque protective covering over same.

1.10 Waste Management and Disposal

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

1.11 Warranty

.1 Warrant the work of this Section against defects of workmanship and material, for a period of ten years from the date of Substantial Performance and agree to make good promptly any defects which occur or become apparent within the warranty period.

.2 Warrant insulating glass units for ten years from date of Substantial Performance against seal failure, interpane dusting, or interpane misting.

.3 Warrant low-emissivity coatings when applied to the second or third surfaces of an insulating glass unit, for ten years against peeling or coating deterioration due to product failure.

.4 Warrant Laminated glass for ten years against delamination and discolouration.

PART 2 PRODUCTS

2.1 Materials-Flat Glass

.1 Float glass: to CAN/CGSB-12.3, glazing quality, 6 mm thick minimum.

.2 Sheet glass: to CAN/CGSB-12.2, selected, 6 mm thick minimum.

.3 Tempered Safety Glass: To CAN/CGSB-12.1, transparent, 6 mm thick unless indicated otherwise. Type 2-tempered.
  .1 Class B-float.
  .2 Category 1 11.
  .3 Edge treatment: ground, bevel edge.

.4 Mirror Glass: Silvered mirror glass: to ASTM C1503, minimum 6 mm thick.
  .1 Type 1B-Float glass for high humidity use. All edges ground and polished.

.5 Display Case doors and shelves: 6mm clear tempered safety glass to CAN/CGSB-12.1, Type 2. All edges ground and beveled.

2.2 Insulating Glass Units

.1 Performance requirements for insulating glass units specified herein are the minimum permitted requirements. Provide engineered shop drawings and calculations showing that glazed assemblies including framing and glazing products in combination, meet or exceed the minimum requirements of MMAH Supplementary Standard SB-10.

.2 Insulating Glass Units: To CAN/CGSB-12.8-M, double glazed sealed units, 25 mm overall thickness.
- .1 Glass: to CAN/CGSB-12.1(tempered).
- .2 Glass thickness: 6.4 mm each light
- .3 Inter-cavity space thickness: 12.7 mm with low conductivity spacers.
- .4 Glass coating: surface number 2, low "E".
- .5 Inert gas fill.

2.3 Fire Rated Glass

.1 Refer to Section 08 88 13

2.4 Transparent Mirror Glass

.1 To ASTM C1376-15. “Mirropane” by Pilkington, or approved equivalent. 6.0 mm thick. Visible transmittance 11%; Visible reflectance (coated side) 68%, Visible reflectance (glass side) 16%.

2.5 Glazing Products

.1 Select appropriate glazing sealants, tapes, gaskets and other glazing materials of proven compatibility with other materials that they contact. These include glass products, insulating glass unit seals and glazing channel substrates under installation and service conditions, as demonstrated by testing and field experience.

.2 Setting blocks: Neoprene 80-90 Shore A durometer hardness to ASTM D 2240, to suit glazing method, glass light weight and area.

.3 Spacer shims: Neoprene 50-60 Shore A durometer hardness to ASTM D 2240, 75 mm long x one half height of glazing stop x thickness to suit application. Self-adhesive on one face.

.4 Glazing tape:
- .1 Preformed butyl compound with integral resilient tube spacing device, 10-15 Shore A durometer hardness to ASTM D 2240; coiled on release paper; black colour.
- .2 Closed cell polyvinyl chloride foam, coiled on release paper over adhesive on two sides, maximum water absorption by volume 2%, designed for compression of 25%, to effect an air and vapour seal.

.5 Glazing splines: resilient polyvinyl chloride, extruded shape to suit glazing channel retaining slot, colour as selected.

.6 Lock-strip gaskets: to ASTM C542.

.7 Glazing Gaskets: To ASTM C864.

.8 Mirror adhesive: Synthetic rubber based adhesive, waterproof and mildew resistant: Lepage PL 610 Construction Mirror Adhesive. Low VOC compliant to SCAQMD Rule 1168-03.

.9 Mirror Clips: CRL zinc plated steel Vancouver type 'H' clips. Size to suit.

.10 Sealant: as specified in Section 07 92 00 – Joint Sealants. Low VOC.

PART 3 EXECUTION

3.1 Manufacturer's Instructions

.1 Compliance: Comply with manufacturer's written data, including product technical bulletins, product catalogue installation instructions, product carton installation instructions, and data sheets.

3.2 Examination

.1 Verify that openings for glazing are correctly sized and within tolerance.

.2 Verify that surfaces of glazing channels or recesses are clean, free of obstructions, and ready to receive glazing.

3.3 Preparation

.1 Clean contact surfaces with solvent and wipe dry.

.2 Seal porous glazing channels or recesses with substrate compatible primer or sealer.

.3 Prime surfaces scheduled to receive sealant.

3.4 Installation – General

.1 Perform work in accordance with GANA Glazing Manual for glazing installation methods.

3.5 Installation: Exterior Dry Method- Preformed Glazing

.1 Cut glazing tape to length; install on glazing light. Seal corners by butting tape and sealing junctions with sealant.

.2 Place setting blocks at 1/4 points, with edge block maximum 150 mm from corners.

.3 Rest glazing on setting blocks and push against fixed stop with sufficient pressure to attain full contact.

.4 Install removable stops without displacing glazing tape. Exert pressure for full continuous contact.

.5 Trim protruding tape edge.

3.6 Installation: Exterior Wet/Dry Method (Preformed Tape and Sealant)

.1 Cut glazing tape to length and set against permanent stops, 6 mm below sight line. Seal corners by butting tape and dabbing with sealant.

.2 Apply heel bead of sealant along intersection of permanent stop with frame ensuring full perimeter seal between glass and frame to complete continuity of air and vapour seal.

.3 Place setting blocks at 1/4 points, with edge block maximum 150 mm from corners.

.4 Rest glazing on setting blocks and push against tape and heel head of sealant with sufficient pressure to attain full contact at perimeter of light or glass unit.

.5 Install removable stops with spacer strips inserted between glazing and applied stops 6 mm below sight line.

.6 Fill gap between glazing and stop with sealant to depth equal to bite of frame on glazing, maximum 9 mm below sight line.

.7 Apply cap head of sealant along void between stop and glazing, to uniform line, flush with sight line. Tool or wipe sealant surface smooth.

3.7 Installation: Interior - Dry Method

.1 Fill gap between glazing and stop with sealant to depth equal to bite of frame on glazing, maximum 9 mm below sight line.

.2 Apply cap bead of sealant along void between stop and glazing, to uniform line, flush with sight line. Tool or wipe sealant surface smooth.

.3 Cut glazing tape to length and set against permanent stops, projecting 1.6 mm above sight line.

.4 Place setting blocks at 1/4 points, with edge block maximum 150 mm from corners.

.5 Rest glazing on setting blocks and push against tape for full contact at perimeter of light or unit.

.6 Place glazing tape on free perimeter of glazing.

.7 Install removable stop without displacement of tape. Exert pressure on tape for full continuous contact.

.8 Knife trim protruding tape.

.9 Glaze hollow metal doors and pressed steel screens. Glass type as indicated.

.10 Install wired glass in fire rated doors and screens to meet requirements of NFPA 80.

3.8 Mirrors

.1 Coordinate work with Section 06 20 00.

.2 Install frameless mirrors in adhesive and with steel H clips, concealed fasteners.

.3 Install mirrors in one piece unless shown otherwise.

.4 Framed mirrors are specified in Section 10 28 10.

3.9 Sliding Glass

.1 Fabricate aluminum track assembly and install tempered glass to suit finished interior screen at Squash Court viewing windows. Glass doors to have finger pulls ground into leading edges. Adjust hardware and provide adjustable lock at each location.

3.10 Cleaning

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

.2 Perform cleaning to remove construction and accumulated environmental dirt.

.3 Remove traces of primer, caulking.

.4 Remove glazing materials from finish surfaces.

.5 Remove labels after work is complete.

.6 Clean glass using approved non-abrasive cleaner in accordance with manufacturer's instructions.

.7 Upon completion of installation, remove surplus materials, rubbish, tools and equipment barriers.

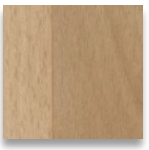
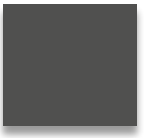
3.11 Protection of Finished Work

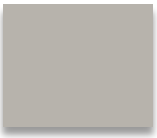
.1 After installation, mark light with an "X" by using removable plastic tape.

End of Section

Section 09 06 00 Schedule of Finishes

Project: 21047- Renovations to St. Louis Main Campus
Date: November 11, 2021

SPEFICIATION SECTION	CODE	SPECIFICATION	GENERAL NOTES *(Refer to RFS and drawings for details)*	SAMPLES
INTERIOR				
09 30 13 Ceramic Flooring	PCT	Manufacturer: Olympia Tile Rock Series Colour: TBD Finish: Matte	Refer to Finish Schedule	
09 65 19 Resistant Tile Flooring	LVT-1	Manufacturer: Altro Quartz Tile Colour:Rock Salt CD 9302 Finish: Standard	Refer to Finish Schedule	
09 65 19 Rubber Wall Base	R	Manufacturer: Johnsonite 3 1/4-inch Tightlock Colour: Burnt Umber 63 Finish: Standard	Refer to Finish Schedule	
09 65 66 Sport Flooring	SF-1	Manufacturer: Tarkett Omnisports HPL Colour: Beech Finish: Standard	Daycare & Supporting Areas Refer to Finish Schedule	
09 65 19 Resilient Rubber Stair Stringers	R	Manufacturer: Tarkett Resilient Rubber Stair Stringers Colour: Burnt Umber 63 Finish: Standard	Stairwells as noted on the Finish Schedule	
06 40 00 Architectural Woodwork Plastic Laminate	PLAM-1	Manufacturer: TBD Colour: Finish:	Hair Styling Millwork Workstation	
06 40 00 Architectural Woodwork Plastic Laminate	PLAM-2	Manufacturer: TBD Colour: Finish:	Hair Styling Storage Millwork	
06 40 00 Architectural Woodwork Plastic Laminate	PLAM-3	Manufacturer: Tafisa Brava Series Colour: Home Sweet Home Finish: Matte	Accent Walls and Display Cases Refer to Finish Schedule	
06 40 00 Architectural Woodwork Plastic Laminate	PLAM-3	Manufacturer: Formica Colour: Elemental Concrete 8830 Finish: Matte	Counter tops in classrooms Refer to Finish Schedule	
06 40 00 Architectural Woodwork Plastic Laminate	PLAM-4	Manufacturer: Colour: Maple Finish: Matte	Millwork in classrooms Refer to Finish Schedule	

SPEFICIATION SECTION	CODE	SPECIFICATION	GENERAL NOTES *(Refer to RFS and drawings for details)*	SAMPLES
09 91 23 Paint	PT1	Manufacturer: Dulux Colour: Barley Beige 30YY 68/024 Finish: Eggshell		
09 91 23 Paint	PT2	Manufacturer: Dulux Colour: Zeppelin 30YY 46/036 Finish: Eggshell		
09 91 23 Paint	PT3	Manufacturer: Dulux Colour: White TBD Finish:		
09 91 23 Paint	PT4	Manufacturer: Dulux Colour: Mansard Stone 30YY 20/029 Finish:	Metal Doors and All Door Frames	

PART 1 GENERAL

1.1 General

.1 Conform to the requirements of Division 1.

1.2 Related Sections

.1 Section 05 41 00 Structural Metal Stud Framing
.2 Section 06 10 00 Rough Carpentry
.3 Section 07 21 13 Building Insulation
.4 Section 07 25 00 Weather Barriers
.5 Section 07 26 00 Vapour Retarders
.6 Section 07 27 00 Air Barriers
.7 Section 07 84 00 Firestopping
.8 Section 07 92 00 Joint Sealants
.9 Section 09 22 16 Non-Structural Metal Framing
.10 Section 09 91 23 Interior Painting

1.3 References

.1 ASTM International (ASTM)
  .1 ASTM C475/C475M-17 Standard Specification for Joint Compound and Joint Tape for Finishing Gypsum Board.
  .2 ASTM C514-04(2014) Standard Specification for Nails for the Application of Gypsum Board
  .3 ASTM C840-17a Standard Specification for Application and Finishing of Gypsum Board
  .4 ASTM C954-15 Standard Specification for Steel Drill Screws for the Application of Gypsum Panel Products or Metal Plaster Bases to Steel Studs from 0.033 in. (0.84 mm) to 0.112 in. (2.84 mm) in Thickness
  .5 ASTM C1002-16 Standard Specification for Steel Self-Piercing Tapping Screws for Application of Gypsum Panel Products or Metal Plaster Bases to Wood Studs or Steel Studs
  .6 ASTM C1047-14a Standard Specification for Accessories for Gypsum Wallboard and Gypsum Veneer Base
  .7 ASTM C1177/C1177M-17 Standard Specification for Glass Mat Gypsum Substrate for Use as Sheathing
  .8 ASTM C1178/C1178M-13 Standard Specification for Coated Glass Mat Water-Resistant Gypsum Backing Panel
  .9 ASTM C1278/C1278M-17 Standard Specification for Fiber-Reinforced Gypsum Panel
  .10 ASTM C1280 - 13a Standard Specification for Application of Exterior Gypsum Panel Products for Use as Sheathing.
  .11 ASTM C1396/C1396M - 17 Standard Specification for Gypsum Board
  .12 ASTM C1629/C1629M-18a Standard Classification for Abuse-Resistant Nondecorated Interior Gypsum Panel Products and Fiber-Reinforced Cement Panels
  .13 ASTM E90-09 Standard Test Method for Laboratory Measurement of Airborne Sound Transmission Loss of Building Partitions and Elements
  .14 ASTM E814-13a Standard Test Method for Fire Tests of Penetration Firestop Systems
  .15 ASTM E1966-15 Standard Test Method for Fire-Resistive Joint Systems
.2 American National Standards Institute (ANSI)
  .1 ANSI A118.9-1992 Test Methods and Specifications for Cementitious Backer Units.
.3 Canadian General Standards Board (CGSB)
  .1 CAN/CGSB-51.34 Vapour Barrier, Polyethylene Sheet for Use in Building Construction.
  .2 CAN/CGSB 19-GP-21M Sealing and Bedding Compound for Acoustical Purposes.

.4 Underwriters Laboratories of Canada (ULC)
  .1 ULC 102-2018 Standard Method of Test for Surface Burning Characteristics of Building Materials and Assemblies.
  .2 ULC 114-2018 Standard Method of Test for Determination of Non-Combustibility in Building Materials
  .3 ULC 129- 2015 Standard Method of Test for Smoulder Resistance of Insulation (Basket Method)
  .4 ULC List of Equipment and Material, Volume III, Fire Resistance Ratings.
.5 Gypsum Association (GA)
  .1 GA-253 Application of Gypsum Sheathing.

1.4 Submittals

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

.2 Product Data:
  .1 Submit manufacturer's instructions, printed product literature and data sheets for gypsum board assemblies and include product characteristics, performance criteria, physical size, finish and limitations.

.3 Samples:
  .1 Submit for review and acceptance of each unit.
  .2 Samples will be returned for inclusion into work.

1.5 Quality Assurance

.1 Dry wall installers: minimum 5 years proven experience.

.2 Test Reports: certified test reports showing compliance with specified performance characteristics and physical properties.

.3 Certificates: product certificates signed by manufacturer certifying materials comply with specified performance characteristics and criteria and physical requirements.

.4 Pre-Installation Meetings: conduct pre-installation meeting to verify project requirements, manufacturer's installation instructions and manufacturer's warranty requirements.

1.6 Design Requirements

.1 Where indicated provide minimum sound transmission rating of installed partitions of STC 50 tested to ASTM E90.

.2 Provide fire resistance rating of installed partitions as indicated and according to referenced IULC design.

1.7 Mock-Ups

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

.2 Construct mock up gypsum board wall installation including one inside corner and one outside corner. Mock-up may be part of finished work.

.3 Allow two working days for inspection of mock-up by Consultant before proceeding with rest of the work.

.4 When accepted, mock-up will demonstrate minimum standard for this work. Mock-up may remain as part of finished work.

1.8 Shipping, Handling and Storage

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

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

.3 Protect gypsum board materials before, during and after installation and to protect the installed work and materials of other trades affected by this work. Store materials in a dry area inside the building. Do not remove wrapping until ready for use. Prevent damage to all edges and surfaces.

1.9 Project Conditions

.1 Maintain temperature minimum 10 ° C, maximum 21 ° C for 48 hours prior to and during application of gypsum boards and joint treatment, and for at least 48 hours after completion of joint treatment.

.2 Apply board and joint treatment to dry, frost free surfaces.

.3 Ventilation: Ventilate building spaces as required to remove excess moisture that would prevent drying of joint treatment material immediately after its application.

1.10 Waste Management and Disposal

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

PART 2 PRODUCTS

2.1 Gypsum Board

.1 To ASTM C1396/C1396M. Standard for non-rated applications, Type X for rated applications, 1220 mm wide x maximum practical length, ends square cut, edges tapered with round edge, 12.7 mm thick or to thickness indicated on drawings. All fire rated board shall be minimum 16 mm thickness.

.2 Water and Moisture Resistant Board: to ASTM C1396, 12.7 mm thick, 1220 mm wide with tapered edges.

.3 Glass Mat Exterior Gypsum Sheathing: to ASTM C1177, 12.7 mm thick, 1219 mm wide x 2440 mm long, square edge.
- .1 Weight: 9.27 kg/m^2
- .2 Surfacing: Fiberglass mat on face, back, and long edges.
- .3 Racking Strength (Ultimate, not design value) (ASTM E72): Not less than 540 pounds per square foot, dry.
- .4 Flexural Strength, Parallel (ASTM C473): 80 lbf, parallel.
- .5 Humidified Deflection (ASTM C1177): Not more than 6.0 mm.
- .6 Permeance (ASTM E96): Not less than 23 perms.
- .7 R-Value (ASTM C518): 0.56.
- .8 Mold Resistance (ASTM D3273): 10, in a test as manufactured.

.9 Microbial Resistance (ASTM D6329, UL Environmental GREENGUARD 3-week protocol): Will not support microbial growth.
.1 CGC Securock
.2 Georgia Pacific DENS-Glass Gold
.3 Certainteed GlasRoc

2.2 Fastening and Adhesives

.1 Drywall Screws: To ASTM C954 or ASTM C1002 self-drilling, self-tapping, case hardened, length to suit board thickness and provide minimum 12 mm penetration into support.

.2 Sheathing Screws: To ASTM C1002, corrosion resistant, heat treated self-tapping sheet metal screws minimum 32 mm long.

.3 Joint Tape: To ASTM C475, 50 mm perforated with preformed seam, mould and mildew resistant.
.1 Joint tape for abuse resistant gypsum board: CGC Mould Resistant Fiberglass Drywall Tape.

.4 Joint Filler and Topping: To ASTM C475 vinyl or latex base, slow setting.

.5 Joint treatment for Gypsum Sheathing: 50 mm wide, 10 x 10 woven threads per 25 mm, self-adhering fibreglass joint tape and Borden HPPG Elmer's Siliconized Acrylic Latex Caulk.

.6 Laminating Compound: as recommended by manufacturer, asbestos-free.

2.3 Acoustic Insulation

.1 Acoustic Insulation: Mineral or Glass Fibre Acoustic Insulation:
.1 Mineral Fibre Acoustic Insulation: To ASTM C665, Mineral fibre blanket insulation, minimum density of 40 kg/m^3:
.1 AFB Acoustical Fire Batts manufactured by Roxul Inc.
.2 Creased SAFB manufactured by Owens Corning Canada.
.2 STC contribution and fire resistance (hour): Refer to NBC 2015, tables A-9.10.3.1-A/-B and Product Data Sheet for various assemblies contributing to acoustic performance and fire resistance.
.3 Surface burning characteristics to ULC 102:
.1 flame spread: 15
.2 smoke developed: 5
.3 Smoulder resistance: to ULC 129.
.4 Non-combustible: to ULC 114-2018
.4 Thickness to suit depth of wall framing and as indicated.

.2 Acoustic sealant: as specified in Section 07 92 00 - Joint Sealants.

2.4 Accessories

.1 Casing beads, corner beads, control joints and edge trim: to ASTM C1047, zinc-coated by hot-dip process 0.5 mm base thickness, perforated flanges, one piece length per location.

.2 Insulating Strip: Rubberized, moisture resistant, 3.0 mm thick, 12 mm wide closed cell neoprene strip, with self-sticking permanent adhesive on one face; lengths as required.

.3 Control Joints: DRM-50-25 2PC extruded aluminum as manufactured by Fry Reglet Corporation to provide a 6 mm reveal.

.4 Control Joints: Bailey D-ZNCJ 7/16 x 10' Drywall or Veneer Plaster Control Joint.

.5 Sealants: as specified in Section 07 92 00 - Joint Sealants.

PART 3 EXECUTION

3.1 General

.1 Prior to installation of gypsum wallboard, ensure that all required vapour barriers, air seals, gaskets and the like installed under another Section have been inspected and accepted by Municipal authorities and the Consultant. Failure to do so will result in removal of all gypsum board installed prior to approval and replacement, at no additional cost to the Owner.

.2 Unless otherwise indicated on the drawings, all gypsum board partitions shall extend from floor level to the underside of floor or roof structures above.

3.2 Acoustic Insulation

.1 Install acoustic blankets full width and length, with tight joints, between wall framing and around penetrating electrical service boxes, piping, air ducts and frames.

.2 Place acoustic blankets where indicated on the Drawings and to thickness required to obtain acoustic performance indicated for the assembly.

.3 Place acoustic blankets between studs ensuring friction fit, free of sags, folds or open joints that may let sound pass through.

.4 Install blankets from the bottom up, tightly adjusted and trim accurately with a utility knife.

3.3 Gypsum Board Application

.1 Do application and finishing of gypsum board in accordance with ASTM C840 except where specified otherwise.

.2 Do not apply gypsum board until bucks, anchors, blocking, electrical, and mechanical work are approved.

.3 Apply gypsum board at right angles to framing members or furring using screw fasteners. Maximum spacing of screws 300 mm o.c.

.4 Apply water or moisture resistant gypsum wallboard where indicated. Apply water resistant sealant to edges, ends and cut outs which expose gypsum core.

.5 Laminate gypsum board to existing masonry wall surfaces where indicated.

.6 Carry gypsum board from floor to underside of floor or roof structure above. Furr out and carry gypsum board around any structural members as may be required. Neatly cope gypsum board to fill deck flutes where gypsum board abuts floor or roof deck.

3.4 Gypsum Sheathing

.1 Install in accordance with GA-253, ASTM C1280 and manufacturer's recommendations.

.2 Install exterior gypsum sheathing horizontally on all exterior walls where indicated. Stagger joints between adjacent sheets.

.3 Screw-attach gypsum sheathing to each stud with 32 mm self-drilling corrosion resistant sheathing screws spaced 10 mm from ends and edges 200 mm o.c. Drive fasteners to bear tight against and flush with surface of sheathing. Do not countersink. Apply sealant around sheathing perimeter at interface with other materials and install flashing as indicated on the drawings.

.4 Apply fibreglass joint treatment to all joints, overlapping at intersections by the width of the tape. Apply 10 mm bead of sealant along the joint and embed the sealant into the entire surface of the tape with a trowel. Apply enough sealant to each exposed fastener to cover completely when trowelled smooth.

3.5 Accessories

.1 Erect accessories straight, plumb or level, rigid and at proper plane. Use full length pieces where practical. Make joints tight, accurately aligned and rigidly secured. Mitre and fit corners accurately, free from rough edges.

.2 Install casing beads where gypsum board butts against surfaces having no trim concealing junction and where indicated.

.3 Install insulating strips continuously at edges of gypsum board or casing beads abutting exterior door or window frames, to provide thermal break.

.4 Install continuous bead of acoustic sealant at all penetrations through sound control partitions.

.5 Provide control joints in gypsum board facing. Control joints shall be supported with metal studs or furring channels on both sides of the joint. Control joints shall be provided:
.1 At abutting structural elements, steel columns.
.2 At expansion or control joints in the substrate;
.3 At maximum 6.0 m spacings on long partition and bulkhead runs;
.4 At each door jamb.

3.6 Access Doors

.1 Install access doors to electrical and mechanical fixtures specified in respective Sections.

.2 Rigidly secure frames to furring or framing systems, to satisfy fire rating requirements.

3.7 Taping and Filling

.1 Finish face panel joints and internal angles with joint system consisting of joint compound, joint tape and taping compound installed according to manufacturer's directions and feathered out onto panel faces.

.2 Finish corner beads, control joints and trims as required with two coats of joint compound and one coat of taping compound, feathered out onto panel faces.

.3 Fill screw head depressions with joint and taping compounds to bring flush with adjacent surface of gypsum board so as to be invisible after painting is completed.

.4 Sand lightly to remove burred edges and other imperfections. Avoid sanding adjacent surface of board.

.5 Completed installation to be smooth, level or plumb, free from waves and other defects and ready for painting.

3.8 Cleaning

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

End of Section

PART 1 GENERAL

1.1 General

.1 Conform to the requirements of Division 1.

1.2 Related Sections

.1 Section 05 41 00 Structural Metal Stud Framing
.2 Section 09 21 16 Gypsum Board

1.3 References

.1 ASTM International (ASTM).
  .1 ASTM A653/A653M-17 Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process
  .2 ASTM C645-14e1 Standard Specification for Nonstructural Steel Framing Members
  .3 ASTM C754-17 Standard Specification for Installation of Steel Framing Members to Receive Screw-Attached Gypsum Panel Products
  .4 ASTM C841-03(2018) Standard Specification for Installation of Interior Lathing and Furring.
  .5 ASTM C1002-16 Standard Specification for Steel Self-Piercing Tapping Screws for Application of Gypsum Panel Products or Metal Plaster Bases to Wood Studs or Steel Studs
  .6 ASTM E90-09(2016) Standard Test Method for Laboratory Measurement of Airborne Sound Transmission Loss of Building Partitions and Elements
  .7 ASTM E814 - 13a(2017) Standard Test Method for Fire Tests of Penetration Firestop Systems
  .8 ASTM E1966-15 Standard Test Method for Fire-Resistive Joint Systems
.2 Canadian General Services Board (CGSB).
  .1 CAN/CGSB-1.40-97 Primer, Structural Steel, Oil Alkyd Type.
.3 Underwriters Laboratories of Canada (ULC)
  .1 ULC List of Equipment and Material, Volume III, Fire Resistance Ratings.
.4 CSSBI Lightweight Steel Framing Manual

1.4 Submittals

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

.2 Product Data:
  .1 Submit manufacturer's instructions, printed product literature and data sheets for metal framing and include product characteristics, performance criteria, physical size, finish and limitations.

.3 Samples:
  .1 Submit duplicate 300 mm long samples of non-structural metal framing.

1.5 Quality Assurance

.1 Test Reports: certified test reports showing compliance with specified performance characteristics and physical properties.

.2 Certificates: product certificates signed by manufacturer certifying materials comply with specified performance characteristics and criteria and physical requirements.

.3 Pre-Installation Meetings: conduct pre-installation meeting to verify project requirements, manufacturer's installation instructions and manufacturer's warranty requirements.

1.6 Shipping, Handling and Storage

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

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

1.7 Waste Management and Disposal

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

PART 2 PRODUCTS

2.1 Metal Stud Framing Systems

.1 Non-load bearing channel stud framing: to ASTM C645, stud size as indicated, roll formed from 0.53 mm thickness hot dipped galvanized steel sheet, for screw attachment of gypsum board. Knock-out service holes at 460 mm centres.
.1 Thickness of materials to conform to referenced standards unless noted otherwise.

.2 Floor and ceiling tracks: to ASTM C645, in widths to suit stud sizes, 32 mm flange height.

.3 Metal channel stiffener: 1.4 mm thick cold rolled steel, coated with rust inhibitive coating.

.4 Tie Wire: 0.90 mm, galvanized, soft annealed, steel wire or clip as recommended by the manufacturer of furring channels.

.5 Wind bearing light weight steel stud framing for exterior wall applications is specified in Section 05 41 00.

2.2 Metal Furring and Suspension Systems

.1 Channel framing: to ASTM C645, stud size as indicated, roll formed from 0.53 mm thickness hot dipped galvanized steel sheet, for screw attachment of gypsum board.
.1 Thickness of materials to conform to referenced standards unless noted otherwise.

.1 Metal Furring Runners, Hangers, Tie Wires, Inserts, Anchors: to ASTM C645 , electro-zinc coated steel.

.2 Runner Channels: 38 x 19 x 0.59 mm and 38 x 9.5 x 0.45 mm, hot dip or electro-galvanized sheet steel. Use of various sizes governed by applied loads and applicable spans.

.3 Drywall Furring Channel: Channel shaped furring member for screw attachment of drywall with knurled face. For interior use. Furring masonry or concrete surfaces. Cross furring under steel joist or suspended metal channels in suspended ceiling systems: 70 x 22 x 0.9 mm with knurled face, hot dip or electro-galvanized sheet steel. Bailey D-1001.

.4 Hangers: minimum 4.1 mm diameter (or as required by ULC fire rating design requirements) mild steel rods.

2.2 Fasteners

.1 Powder activated fasteners: to suit structural conditions and fastening requirements and in accordance with manufacturer's recommendations: Ramset; Hilti; or approved equivalent.

.2 Sheet Metal Screws: To CSA A82.31-M, and ASTM C1002, self-drilling, self-tapping, case hardened, length to suit board thickness and provide minimum 12 mm penetration into support.

2.3 Accessories

.1 Acoustic sealant: To ASTM E814 and ASTM E1966, with STC performance rating of 55 to ASTM E90.

.2 Insulating strip: rubberized, moisture resistant 3 mm thick foam strip, 12 mm wide, with self-sticking adhesive on one face, lengths as required.

.3 Zinc Rich Paint: to CGSB 1-GP-181M. Low VOC type.

PART 3 EXECUTION

3.1 Examination

.1 Verification of Conditions: verify that conditions of substrate previously installed under other Sections or Contracts are acceptable for non-structural metal framing application in accordance with manufacturer's written instructions.
  .1 Visually inspect substrate in presence of Consultant.
  .2 Inform Consultant of unacceptable conditions immediately upon discovery.
  .3 Proceed with installation only after unacceptable conditions have been remedied [and after receipt of written approval to proceed from Consultant.

3.2 Erection

.1 Unless otherwise indicated on the drawings, all gypsum board partitions shall extend from floor level to the underside of floor or roof structures above.

.2 Align partition tracks at floor and ceiling and secure at 600 mm on centre maximum.

.3 Install damp proof course under stud shoe tracks of partitions on slabs on grade.

.4 Place studs vertically at 400 mm on centre unless noted otherwise and not more than 50 mm from abutting walls, and at each side of openings and corners. Position studs in tracks at floor and ceiling. Cross brace steel studs as required to provide rigid installation to manufacturer's instructions.

.5 Erect metal studding to tolerance of 1:1000.

.6 Attach studs to bottom and ceiling track using screws.

.7 Co-ordinate simultaneous erection of studs with installation of service lines. When erecting studs ensure web openings are aligned.

.8 Co-ordinate erection of studs with installation of door/window frames and special supports or anchorage for work specified in other Sections.

.9 Provide two studs extending from floor to ceiling at each side of openings wider than stud centres specified. Secure studs together, 50 mm apart using column clips or other approved means of fastening placed alongside frame anchor clips.

.10 Install heavy thickness single jamb studs at openings.

.11 Erect track at head of door/window openings and sills of window openings to accommodate intermediate studs. Secure track to studs at each end, in accordance with manufacturer's instructions. Install intermediate studs above and below openings in same manner and spacing as wall studs.

.12 Frame openings and around built-in equipment, cabinets, access panels, on four sides. Extend framing into reveals. Check clearances with equipment suppliers.

.13 Provide 40 mm stud or furring channel secured between studs for attachment of fixtures behind lavatory basins, toilet and bathroom accessories, and other fixtures including grab bars and towel rails, attached to steel stud partitions.

.14 Install steel studs or furring channel between studs for attaching electrical and other boxes.

.15 Maintain clearance under beams and structural slabs to avoid transmission of structural loads to studs. Use 50 mm leg ceiling tracks.

.16 Install continuous insulating strips to isolate studs from un-insulated surfaces.

.17 Install two continuous beads of acoustical sealant under studs and tracks around perimeter of sound control partitions.

3.3 Wall Furring

.1 Install wall furring for gypsum board wall finishes in accordance with CSA A82.31-M, except where specified otherwise and shown on drawings.

.2 Frame openings and around built-in equipment, cabinets, access panels, etc., on four sides. Extend furring into reveals. Check clearances with equipment suppliers.

.3 Furr duct shafts, beams, columns, pipes and exposed services where indicated.

3.4 Suspended and Furred Ceilings and Bulkheads

.1 Erect hanger and runner channels for suspended gypsum board ceilings in accordance with CSA A82.31-M except where specified otherwise and indicated on drawings.

.2 Securely anchor hanger to structural supports 1220 mm o.c. maximum along runner channels and not more than 150 mm from ends. Under no circumstances shall hanger wires be secured to or supported from mechanical or electrical materials or equipment or penetrate mechanical ductwork.

.3 Space runner or furring channels as shown on drawings and not more than 610 mm o.c. maximum nor 150 mm from walls. Run channels in long direction of board. Bend hanger sharply under bottom flange of runner and securely wire in place with a saddle tie. Provide channels below mechanical or electrical equipment and mechanical ductwork to maintain maximum spacing.

.4 Install furring channels transversely across runner channels in short direction of wallboard at 610 mm o.c. maximum or 150 mm from walls and interruptions in ceiling continuity. Secure channels to support with furring clips or wire. Where splicing is necessary lap minimum 200 mm and wire tie each end with double loops of 0.90 mm galvanized tie wire, 25 mm from each end of overlap.

.5 Support light fixtures by providing additional ceiling suspension hangers within 150 mm of each corner and at maximum 610 mm around perimeter of fixture. Coordinate with Electrical.

.6 Install work level to tolerance of 1:1200.

.7 Frame with furring channels, perimeter of openings for access panels, light fixtures, diffusers, grilles, etc.

.8 Install furring channels parallel to, and at exact locations of steel stud partition header track.

.9 Furr for gypsum board faced vertical bulkheads within or at termination of ceilings.

3.5 Gypsum Board

.1 Installation of gypsum board is specified in Section 09 21 16

3.6 Cleaning

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

.2 Upon completion of installation, remove surplus materials, rubbish, tools and equipment barriers.

End of Section

PART 1 GENERAL

1.1 General

.1 Conform to the requirements of Division 1.

1.2 Related Sections

.1 Section 03 30 00 Cast-in-Place Concrete
.2 Section 04 20 00 Concrete Unit Masonry
.3 Section 07 92 00 Joint Sealants
.4 Section 09 21 16 Gypsum Board
.5 Section 09 65 19 Resilient Flooring
.6 Section 09 91 23 Interior Painting

1.3 References

.1 ASTM International (ASTM)
  .1 ASTM C150/C150M-18 Standard Specification for Portland Cement
  .2 ASTM C207-06 (2011) Standard Specification for Hydrated Lime for Masonry Purposes
.2 American National Standards Institute (ANSI)
  .1 ANSI A108/A118/A136.1:2017 American National Specifications for the Installation of Ceramic Tile.
  .2 ANSI A118.10 Waterproof Membrane
  .3 ANSI A137.1: 2017 American National Standard Specifications for Ceramic Tile
.3 Canadian General Standards Board (CGSB)
  .1 CGSB 71-GP 22M 1978 Adhesive, Organic, for Installation of Ceramic Wall Tile
.4 International Standards Organization (ISO)
  .1 ISO 10545 Series Ceramic Tiles, Standards for Testing
  .2 ISO 13006-2012 Ceramic Tiles, Definitions, Classifications, Characteristics and Marking.
  .3 ISO 13007-2010 Ceramic Tiles, Grouts and Adhesives.
.5 Terrazzo, Tile and Marble Association of Canada (TTMAC)
  .1 TTMAC 2016-2017 Specifications Guide 09 30 00, Tile Installation Manual.
  .2 TTMAC Hard Surface Maintenance Guide.

1.4 Submittals

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

.2 Provide product data. Include manufacturer's information on:
  .1 Ceramic tile, marked to show each type, size, and shape required.
  .2 Mortar and grout.
  .3 Divider strip.
  .4 Levelling compound.
  .5 Waterproofing isolation membrane.

.3 Submit duplicate samples of tile. Samples to be submitted on 300 x 600 mm sample board for each colour, texture, size and pattern of tile. Grout sample joints for representative sample of final installation.

.4 Trim and Accessories: submit duplicate samples of each trim.

.5 Maintenance Data: Provide maintenance data for tile work, for incorporation into Maintenance Manuals specified under Section 01 78 00.

1.5 Quality Assurance

.1 Do tile work in accordance with Installation Manual 200, Ceramic Tile, by Terrazzo, Tile and Marble Association of Canada (TTMA), except where this specification is more stringent.

.2 For the installation of ceramic tile, use only skilled tradesmen who are familiar with the referenced standards and with the requirements for this Work.

.3 The setting material manufacturer's representative shall review the details with the Contractor prior to the start of work. Instruct the Contractor on the proper installation procedures to ensure compliance with the guarantee requirements.

1.6 Shipping, Handling and Storage

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

.2 Deliver packaged materials in original unopened containers.

.3 Keep delivered material dry and free from stains. Store cementitious material off damp surfaces.

.4 Use all means necessary to protect materials, before, during and after installation and to protect the installed work and materials of all other trades.

.5 In the event of damage, immediately make all repairs and replacements necessary to the approval of the Consultant and at no additional cost to the Owner.

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

1.7 Project Conditions

.1 Maintain air temperature and structural base temperature at ceramic tile installation area above 12 °C for 48 hours before, during and after installation.

.2 Do not install tiles at temperatures less than 12 °C or above 38 °C.

.3 Do not apply epoxy mortar and grouts at temperatures below 15 °C or above 25 °C.

.4 Provide and maintain temporary lighting. Lighting levels shall be sufficient to complete work including inspections. Provide minimum lighting levels of 400 lux at work areas.

1.8 Qualifications

.1 Installer of ceramic tiles shall have a minimum of 10 years of experience including at least five projects of similar scope and scale. Submit documented proof of experience prior to commencing work of this Section.

1.9 Waste Management and Disposal

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

1.10 Maintenance

.1 Upon completion of the installation and as a condition of acceptance, deliver to the Owner 2% of tile and accessory tiles in each colour and pattern of ceramic tiles installed under this section for the Owners maintenance program. Identify each carton for location and installation date. Submission must be made all at one time and prior to Substantial Performance.

1.11 Warranty

.1 Warrant the work of this Section against defects of workmanship and material, for a period of five years from the date of Substantial Performance and agree to make good promptly any defects which occur or become apparent within the warranty period.

PART 2 PRODUCTS

2.1 Materials

.1 Materials shall be graded and containers grade sealed, delivered to the job site in their original packages or containers with the manufacturer's labels and seals intact.

.2 Tile and grout colours shall be selected by the Consultant from the manufacturer's standard range of colours.

.3 Tile shall conform to ANSI A137.1.

.4 Floor tile shall have coefficient of slip resistance conforming to ANSI A137.1.

.5 Provide coves, corners, reveals, surf caps, inners and outers as required to complete the work.

2.2 Ceramic Tile

.1 CT1: Ceramic Wall Tile: Olympia Colour & Dimension Collection, bright glazed, 102 x 408 mm. Up to four (4) colours will be selected (80% field colour, 20% Accent colours).-Refer to finishes schedule.

.2 PCT1: Ceramic Floor Tile: Olympia Rock Series 305 x 610 mm. Matte Finish. Up to two (2) colours will be selected. -Refer to finishes schedule.

.3

2.3 Mortar, Grout, Additives and Adhesives

.1 The products of one manufacturer shall be used throughout the project to ensure compatibility of materials. Manufacturers of commercial mortar, grout and adhesive having product considered acceptable for use:
   .1 Laticrete
   .2 Mapei
   .3 Flextile

.2 Water: Potable.

.3 Floors: (thinset) T.T.M.A. Detail #317 SP “A”.

.1 Thinset mortar: Laticrete 4237 latex additive plus 211 Crete filler powder or Mapei Kerabond mixed with Keralastic high performance latex admixture or Flextile 52 thin set.
.2 Levelling Compound (if required): Laticrete 3701 latex or 226 Mapecem mortar mixed with Planicrete 50.
.3 Grout: Laticrete Latapoxy SP100, solid epoxy grout or Mapei Kerapoxy. Colours to Consultant's selection.

.4 Floors: (thinset) T.T.M.A. Detail #311F.
.1 Waterproof/uncoupling membrane
.2 Thinset mortar: Laticrete 4237 latex additive plus 211 Crete filler powder or Mapei Kerabond mixed with Keralastic high performance latex admixture or Flextile 52 thin set.
.3 Levelling Compound (if required): Laticrete 3701 latex or 226 Mapecem mortar mixed with Planicrete 50.
.4 Grout: Laticrete Latapoxy SP100, solid epoxy grout or Mapei Kerapoxy. Colours to Consultant's selection.

.5 Walls:
.1 Concrete and Concrete Block: T.T.M.A.C. Detail #303W:
.1 Levelling Coat: Laticrete 3701 or Mapei Mapecem mixed with Planicrete 50.
.2 Thinset mortar: Laticrete 4237 latex additive plus 211 Crete filler powder or Mapei Kerabond mixed with Keralastic high performance latex admixture.
.3 Grout: Laticrete Latapoxy SP100 solid epoxy grout or Kerapoxy. Colours to Consultant's selection.

.2 Gypsum Board:T.T.M.A.C. Detail #304W:
.1 Levelling Coat: Laticrete 3701 or Mapei Mapecem mixed with Planicrete 50.
.2 Thinset mortar: Laticrete 4237 latex additive plus 211 Crete filler powder or Mapei Kerabond mixed with Keralastic high performance latex admixture.
.3 Grout: Flextile Polymer modified unsanded grout, Laticrete Latapoxy SP100 solid epoxy grout or Mapei Kerapoxy. Colours to Consultant's selection.

2.4 Patching and Levelling Compound

.1 Portland cement base, acrylic polymer compound, manufactured specifically for resurfacing and levelling concrete floors, capable of being applied in layers up to 50 mm thick, being brought to feather edge, and being trowelled to smooth finish and having not less than the following physical properties:
.1 Compressive strength: 25 MPa.
.2 Tensile strength: 7 MPa.
.3 Flexural strength: 7 MPa.
.4 Density: 1.9
.5 Products containing gypsum are not acceptable.

.2 Levelling Compound: Laticrete 3701 latex or 226 Mapecem mortar mixed with Planicrete 50.

2.5 Floor Sealer and Protective Coating

.1 To tile and grout manufacturer’s recommendations.

2.6 Accessories

.1 Reducers, edge trim, and transition strips: Schluter Systems purpose made aluminum.

.2 Stair Nosing: Schluter TREP-G, 55mm wide, Colours to be selected by the Consultant.

.3 CT Edge Protection: Schluter RONDEC, size to suit tile thickness. Satin anodized aluminum. Trim to come with all connectors or end caps required for a complete and finished installation. As a minimum, provide edge protection at the following locations:
.1 Top of PCT Base;
.2 Top of CT wall tile;
.3 All outside corners of wall tile or porcelain ceramic tile base.

.4 Transition Strip: (Porcelain ceramic tile to resilient flooring): Schluter RENO.V, satin anodized aluminum transition strips.

.5 Transition Strips
.1 TS1: Schluter Reno-Ramp-K, Type 304 Stainless Steel.

.6 Sealant: as specified in Section 07 92 00.

PART 3 EXECUTION

3.1 Surface Conditions

.1 Surfaces on which tile is to be applied, shall be thoroughly cleaned down.

.2 Verify that concrete substrates have been allowed to cure for a minimum of 28 days in accordance with TTMAC requirements.

.3 Verify that substrates for bonding tile are firm; dry; clean; free from oil, waxy films, and curing compounds; and are within starting flatness tolerances as specified in Section 03 30 00, and are ready for application of levelling materials specified in this Section.

.4 Verify that installation of grounds, anchors, recessed frames, electrical and mechanical units of Work, and similar items located in or behind tile have been completed before installing tile.

.5 Drywall surfaces on which wall and floor tile is to be applied, shall be free from dust, excess plaster and shall be plain and true without any irregularities. Prepare existing gypsum board surfaces as recommended by TTMAC and product manufacturer to support tile installation.

.6 Existing painted masonry or concrete wall surfaces to receive ceramic tile shall be thoroughly cleaned of all paint down to concrete or concrete block surfaces using paint stripper. Prepare painted surfaces in accordance with manufacturer’s instructions and TTMAC recommendations.

.7 In the event of discrepancies, immediately notify the Consultant and do not proceed with installation in such areas until all such discrepancies have been fully resolved.

.8 Check that conditions of temperature, humidity, traffic and usage are suitable as required by Installation Manual specifications. Minimum temperature to be not less than 10°C.

.9 Check that surfaces ready to receive tiling are cured, level and/or graded, plumb, smooth, firm, free from loose particles, droppings, projection, grease, solvent, paint and other foreign matter and from other unsuitable conditions.

.10 Install transition strips, reducers and edge trim at exposed edges of all tiled walls and floors in accordance with manufacturer's instructions.

3.2 Installation

.1 Install tiling in accordance with requirements of TTMAC Tile Installation Manual and parts of ANSI A108 Series of tile installation standards that apply to types of bonding and grouting materials, and to methods required for complete tile installation.

.2 Extend tile work into recesses and under or behind equipment and fixtures to form a complete covering without interruptions:
.1 Terminate Work neatly at obstructions, edges, and corners without disrupting pattern or joint alignments.
.2 Make cut edges smooth, even and free from chipping.
.3 Do not split tile.

.3 Accurately form intersections and returns; perform cutting and drilling of tile without marring visible surfaces:
.1 Cut, drill, and fit tile to accommodate work of other subcontractors penetrating or abutting work of this Section.
.2 Carefully grind cut edges of tile abutting trim, finish, or built in items for straight aligned joints.
.3 Fit tile closely to electrical outlets, piping, fixtures, and other penetrations so that plates, collars, or covers overlap tile and to provide a uniform joint appearance.

.4 Lay tile in pattern indicated on Drawings and as follows:
.1 Align joints when adjoining tiles on floor, base, walls, and trim are the same size.
.2 Centre tile patterns between control and movement joints; notify Consultant for further instructions where tile patterns do not align with control or movement joints.
.3 Cut tile accurately and without damage.
.4 Smooth exposed cut edges with abrasive stone, where exposed.
.5 Chipped or split edges are not acceptable.

.5 Bonding Bed: Set tile in place while bond coat is wet and tacky and as follows:
.1 Adjust amount of bonding materials placed on substrates based on temperature and humidity to prevent skinning over of bonding materials.
.2 Use sufficient bond coat to provide a minimum 80% contact for tiles smaller than 300 mm x 300 mm with bonding material evenly dispersed and pressed into back of tile; refer to back buttering requirements for larger materials and installations having Moderate or higher Load Bearing Performance requirements.
.3 Notch bond coat in horizontal straight lines and set on freshly placed bonding material while moving (sliding) tile back and forth at 90° to notches.
.4 Verify that corner and edges are fully supported by bonding material.
.5 Set tiles to prevent lippage greater than 1 mm over a 3 mm grout joint.
.6 Keep two-thirds of grout joint depth free of bonding materials.
.7 Clean excess bonding materials from tile surface prior to final set.
.8 Sound tiles after bonding materials have cured and replace hollow sounding tile before grouting.

.6 Back Buttering: Obtain 100% mortar coverage in accordance with applicable requirements for back buttering of tile in referenced TTMAC and ANSI A108 series of tile installation standards for the following applications:
.1 Glass tile
.2 Exterior tile

.3 Tile in wet areas:
.1 Washroom
.4 Tile installed with chemical resistant mortars and grouts
.5 Tile having tiles 300 mm or larger in any direction
.6 Tile having tiles with raised or textured backs
.7 Tile having tile installation rated for Heavy or Extra Heavy Duty.
.8 All porcelain tiles with more than 20% of the tile backs covered with firing release dust back buttered so that 100% of the back is covered with adhesive mortar rated for C627, Extra Heavy Duty rating.

.7 Install prefabricated edge strips and control at locations indicated or where exposed edge of floor tile meets different flooring materials and exposed substrates.

.8 Protect exposed edges of floor tile with properly sized transition strips, use sloped reducer strips where uneven transitions between 6 mm and 13 mm occur.

.9 Control and Movement Joints: Install control joints and expansion joints in tile work in accordance with TTMAC Detail 301MJ; keep control and expansion joints free of bonding materials and as follows:
.1 Cut tiles to establish line of joints; sawn joints after installation of tiles will not be acceptable.
.2 Locate joints in tile surfaces directly above joints in concrete substrates.
.3 Provide floor control joints over structural control joints.
.4 Install prefabricated joint profiles in accordance with manufacturer's written instructions, set with top surface of joint profile slightly below top surface of tile.
.5 Prepare joints and apply sealants in accordance with requirements of Section 07 92 00.
.6 Keep control and movement joints free from setting materials.
.7 Form an open joint for sealant in tile wherever a change in backing material occurs, at all vertical interior corners, around penetrating pipes and fixtures, and where tile abuts other materials or fixtures.
.8 Install control joints where indicated or at not less than the flowing spacings:

Environment	Minimum	Maximum	Joint Width (minimum)
Interior/Shaded	4800 mm	6100 mm	6 mm
Interior/Sunlight	2400 mm	3700 mm	6 mm
Exterior/Normal	2400 mm	3700 mm	10 mm
Exterior/Excessive	2400 mm	3000 mm	13 mm

3.3 Grouting

.1 Grouting: Install grout in accordance with manufacturer's written instructions, the requirements of TTMAC, and as follows:
.1 Allow proper setting time before application of grout.
.2 Pre-seal or wax tiles requiring protection from grout staining.
.3 Force grout into joints to a smooth, dense finish.
.4 Remove excess grout in accordance with manufacturer's written instructions and polish tile with clean cloths.

.2 Grout all tile using specified grout in strict accordance with manufacturers written instructions all to give a flush, hard joint.

.3 Joints in tile shall be filled solid and flush with grout.

.4 Prepare joints and mix grout in accordance with manufacturer's printed instructions. Force maximum amount of grout into joints, avoiding air traps or voids.

.5 Remove all excess grout by washing diagonally across the joints. Check for voids, air pockets and gaps and fill same. Remove all discoloured grout and replace with new.

.6 Cure all joints.

3.4 Floor Sealer and Protective Coatings

.1 Apply in accordance with manufacturer’s instructions.

3.5 Cleaning and Protection

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

.2 Cleaning: Clean tile surfaces so they are free of foreign matter using manufacturer recommended cleaning products and methods after completion of placement and grouting and as follows:
- .1 Remove grout residue from tile as soon as possible.
- .2 Unglazed tile may be cleaned with acid solutions only when permitted by tile and grout manufacturer’s written instructions, but no sooner than 10 days after installation; protect metal surfaces, cast iron, and vitreous plumbing fixtures from effects of acid cleaning.
- .3 Flush surface with clean water before and after cleaning.

.3 Protection: Leave finished installation clean and free of cracked, chipped, broken, unbonded, or other tile deficiencies as follows:
- .1 Protect finished areas from traffic until setting materials have sufficiently cured in accordance with TTMAC requirements.
- .2 Protect floor areas from traffic after grouting is completed in accordance with manufacturer’s written instructions.
- .3 Prevent foot and wheel traffic from floors for a minimum of 24 hours after completion of grouting.
- .4 Provide protective covering until Substantial Performance of the Work.

End of Section

PART 1 GENERAL

1.1 General

.1 Conform to the requirements of Division 1.

1.2 Related Sections

.1 Section 09 21 16 Gypsum Board
.2 Section 09 53 00 Acoustical Suspension

1.3 References

.1 ASTM International (ASTM)
  .1 ASTM C423-17 Standard Test Method for Sound Absorption and Sound Absorption Coefficients by the Reverberation Room Method
  .2 ASTM E84-18b Standard Test Method for Surface Burning Characteristics of Building Materials
  .3 ASTM E1264-14 Standard Classification for Acoustical Ceiling Products
  .4 ASTM E1414/E1414M-16 Standard Test Method for Airborne Sound Attenuation Between Rooms Sharing a Common Ceiling Plenum
  .5 ASTM E1477-98A(2017)e1 Standard Test Method for Luminous Reflectance Factor of Acoustical Materials by Use of Integrating-Sphere Reflectometers
.2 Underwriters Laboratories of Canada (ULC)
  .1 ULC 102-2018 Standard Method of Test for Surface Burning Characteristics of Building Materials and Assemblies.

1.4 Submittals

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

.2 Product Data: Submit manufacturer's technical data for each type of acoustical ceiling unit and suspension system required.
  .1 Acoustical Certifications: Manufacturer's certifications that products comply with specified requirements, including laboratory reports showing compliance with specified tests and standards. For acoustical performance, each carton of material must carry an approved independent laboratory classification of NRC, CAC, and AC.

.3 Submit duplicate 300 x 300 mm samples of each type of acoustical units.

.4 Provide maintenance data for acoustic panel ceilings for incorporation into Operation and Maintenance Manual specified in Section 01 78 00 – Closeout Submittals.

1.5 Quality Assurance

.1 Single-Source Responsibility: Provide acoustical panel units and grid components by a single manufacturer.
  .1 Fire Performance Characteristics: Identify acoustical ceiling components with appropriate markings of applicable testing and inspecting organization.
  .2 Surface Burning Characteristics: As follows, tested per ASTM E 84 and complying with ASTM E 1264 Classification.
  .3 Fire Resistance: As follows tested per ASTM E119 and listed in the appropriate floor or roof design in the Underwriters Laboratories Fire Resistance Directory

.2 Coordination of Work: Coordinate acoustical ceiling work with installers of related work including, but not limited to building insulation, gypsum board, light fixtures, mechanical systems, electrical systems, and sprinklers.

.3 Mock-up:
.1 Construct mock-ups in accordance with Section 01 45 00 - Quality Control.
.2 Construct mock-up 10 m² minimum of acoustical panel tile ceiling including one inside corner and one outside corner.
.3 Construct mock-up where directed.
.4 Allow 48 hours for inspection of mock-up by Consultant before proceeding with ceiling work.
.5 When accepted, mock-up will demonstrate minimum standard for this work. Mock-up may remain as part of the finished work.

1.6 Project Conditions

.1 Permit wet work to dry before beginning to install.

.2 Maintain uniform minimum temperature of 15° C and humidity of 20-40% before and during installation.

.3 Store materials in work area 48 hours prior to installation.

.4 Building areas to receive ceilings shall be free of construction dust and debris.

1.7 Performance Requirements

.1 Surface-Burning Characteristics: Conform to ULC S102 or ASTM E84; testing by a qualified testing agency. Identify products with appropriate markings of applicable testing agency.

.2 Seismic Performance: Acoustical ceiling shall withstand the effects of earthquake motions determined according to applicable code.

1.8 Shipping, Handling and Storage

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

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

.3 Protect on site stored or installed absorptive material from moisture damage.

1.9 Waste Management and Disposal

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

1.10 Extra Materials

.1 Provide extra materials of acoustic units in accordance with Section 01 78 00 - Closeout Submittals.

.2 Provide acoustical units amounting to 5% of gross ceiling area for each pattern and type required for project.

.3 Ensure extra materials are from same production run as installed materials.

PART 2 PRODUCTS

2.1 Materials

.1 Acoustic units for suspended ceiling system: to ASTM E1264

.2 Panel Type 1: CGC Fissured.
- .1 Class A.
- .2 Composition: Water Felted Mineral Fiber
- .3 Pattern regular fissured.
- .4 Texture: medium.
- .5 Flame spread: ASTM E1264, Class A (U.L.C.), 25 or less.
- .6 Smoke developed 50 or less in accordance with ULC 102.
- .7 Noise Reduction Coefficient (NRC): ASTM C423; Classified with UL label, 0.55
- .8 Ceiling Attenuation Class (CAC): ASTM C1414; Classified with UL label, 35
- .9 Light Reflectance (LR) range of 0.81 to ASTM E1477.
- .10 Dimensional Stability: Standard
- .11 Edge Profile: Square Lay-In
- .12 Colour: White.
- .13 Size 610 x 1219 x 16 mm thick.
- .14 Shape flat.
- .15 Surface coverings: Ecolabel certified paint.

.3 Alternate manufacturer: Products as manufactured by the following are acceptable, subject to Consultants approval of style, finish, performance characteristics and texture:
- .1 Armstrong Industries
- .2 Certainteed

.4 Ceiling Suspension System: as specified in Section 09 53 00.

PART 3 EXECUTION

3.1 Examination

.1 Do not install acoustical panels until work above ceiling has been inspected by Consultant.

3.2 Installation

.1 Co-ordinate with Section 09 53 00 - Acoustical Suspension.

.2 Coordinate layout and installation of ceilings with other construction that penetrates ceilings or is supported by them, including light fixtures, HVAC equipment, and fire-suppression system.

.3 Install acoustical panels and tiles in ceiling suspension system.

.4 Install acoustical units parallel to building lines with edge unit not less than 50% of unit width, with directional pattern running in same direction. Refer to reflected ceiling plan.

.5 Scribe acoustic units to fit adjacent work. Butt joints tight, terminate edges with moulding

3.3 Cleaning

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

End of Section

PART 1 GENERAL

1.1 General

.1 Conform to the requirements of Division 1.

1.2 Related Sections

.1 Section 05 12 23 Structural Steel
.2 Section 09 21 16 Gypsum Board
.3 Section 09 51 13 Acoustic Panel Ceilings
.4 Division 23 Mechanical
.5 Division 26 Electrical

1.3 References

.1 ASTM International (ASTM)
  .1 ASTM A641/A641M-09a (2014) Standard Specification for Zinc–Coated (Galvanized) Carbon Steel Wire.
  .2 ASTM C635/C635M-17 Standard Specification for the Manufacture, Performance, and Testing of Metal Suspension Systems for Acoustical Tile and Lay in Panel Ceilings.
  .3 ASTM C636/C636M-13 Standard Practice for Installation of Metal Ceiling Suspension Systems for Acoustical Tile and Lay-In Panels.
  .4 ASTM E84-18b Standard Test Method for Surface Burning Characteristics of Building Materials
  .5 ASTM E119-18ce1 Standard Test Methods for Fire Tests of Building Construction and Materials
  .6 ASTM E1264-14 Standard Classification for Acoustical Ceiling Products

1.4 Submittals

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

.2 Product Data: Submit manufacturer's technical data for each type of acoustical ceiling unit and suspension system required.

.3 Acoustical Certifications: Manufacturer's certifications that products comply with specified requirements, including laboratory reports showing compliance with specified tests and standards.

.4 Submit one representative model of each type of ceiling suspension system.
  .1 Ceiling system to show basic construction and assembly, treatment at walls, recessed fixtures, splicing, interlocking, finishes, acoustical unit installation.

1.5 Design Requirements

.1 Determine the superimposed loads that will be applied to suspension systems by components of the building other than the ceiling and ensure that adequate hangers are installed to support the additional loads in conjunction with the normal loads of the system.

.2 Design supplemental suspension members and hangers where width of ducts and other construction within ceiling plenum produces hanger spacing that interferes with location of hangers at required spacing to support standard suspension system members:

.1 Size supplemental suspension members and hangers to support ceiling loads within performance limits established by referenced standards and publications.

.3 Rigidly secure acoustic ceiling system including integral mechanical and electrical components with maximum deflection of L/360 to ASTM C635 deflection test.

1.6 Performance Requirements

.1 Seismic Performance: Acoustical ceiling shall withstand the effects of earthquake motions determined according to applicable code.

1.7 Quality Assurance

.1 Single-Source Responsibility: Provide acoustical panel units and grid components by a single manufacturer.
.1 Fire Performance Characteristics: Identify acoustical ceiling components with appropriate markings of applicable testing and inspecting organization.
.2 Surface Burning Characteristics: Tested per ASTM E84 and complying with ASTM E1264 Classification.

.2 Coordination of Work: Coordinate acoustical ceiling work with installers of related work including, but not limited to building insulation, gypsum board, light fixtures, mechanical systems, electrical systems, and sprinklers.

.3 Where required, provide fire-resistance rated suspension system: certified by a Canadian Certification Organization accredited by Standards Council of Canada.

.4 Construct mock-ups in accordance with Section 01 45 00 - Quality Control and as described in Section 09 51 13.

1.8 Shipping, Handling and Storage

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

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

1.9 Waste Management and Disposal

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

PART 2 PRODUCTS

2.1 Materials

.1 Components: All main beams and cross tees, base metal and end detail shall be commercial quality hot-dipped galvanized steel as per ASTM C635. Main beams and cross tees shall be double-web steel construction with type exposed flange design. Exposed surfaces chemically cleansed, capping pre-finished galvanized steel in baked polyester paint. Main beams and cross tees shall have rotary stitching.

.2 Face width: 22 mm

.3 Edge Moldings and Trim: Hemmed angle moulding to match main beams and cross tees.

.4 Structural Classification: Intermediate Duty System, ASTM C635.

.5 Colour: White and match the actual colour of the specified ceiling tile.

.6 Standard of Acceptance:
.1 Armstrong Prelude XL
.2 Donn DXT
.3 Certainteed Classic Environmental Stab.

.7 Attachment Devices: Size for five times design load indicated in ASTM C635, Table 1, Direct Hung unless otherwise indicated.

.8 Wire for Hangers and Ties: ASTM A641, Class 1 zinc coating, soft annealed, with a yield stress load of at least time three design load, but not less than 2.06 mm thick.

PART 3 EXECUTION

3.1 Manufacturer's Instructions

.1 Compliance: comply with manufacturer's written recommendations or specifications, including product technical bulletins, handling, storage and installation instructions, and datasheets.

3.2 Examination

.1 Do not proceed with installation until all wet work such as concrete, plastering and painting has been completed and thoroughly dried out, unless expressly permitted by manufacturer's printed recommendations.

3.3 Preparation

.1 Measure each ceiling area and establish layout of acoustical units to balance border widths at opposite edges of each ceiling. Avoid use of less than half width units at borders and comply with reflected ceiling plans. Coordinate panel layout with mechanical and electrical fixtures.

.2 Coordination: Furnish layouts for preset inserts, clips, and other ceiling anchors whose installation is specified in other sections.
.1 Furnish concrete inserts and similar devices to other trades for installation well in advance of time needed for coordination of other work.

3.4 Installation

.1 Install suspension system and panels in compliance with ASTM C636; CISCA Seismic Guidelines and in accordance with the manufacturer's installation instructions.

.2 Install wall moldings at intersection of suspended ceiling and vertical surfaces.

.3 Do not erect ceiling suspension system until work above ceiling has been inspected by Consultant.

.4 Secure hangers to overhead structure using attachment methods as indicated by manufacturer. Do not suspend ceiling systems from building services including plumbing lines, conduit, cable trays or duct work.

.5 Install hangers spaced at maximum 1219 mm centres and within 152 mm from ends of main tees. Install hanger wires plumb and straight.

.6 Lay out centre line of ceiling both ways, to provide balanced borders at room perimeter with border units not less than 50% of standard unit width.

.7 Ensure suspension system is coordinated with location of related components.

.8 Completed suspension system to support super-imposed loads, such as lighting fixtures, diffusers, grilles, and speakers.

.9 Support at light fixtures and diffusers with additional ceiling suspension hangers within 150 mm of each corner and at maximum 610 mm around perimeter of fixture.

.10 Interlock cross member to main runner to provide rigid assembly.

.11 Frame at openings for light fixtures, air diffusers, speakers and at changes in ceiling heights.

.12 Install access splines to provide ceiling access.

.13 Finished ceiling system to be square with adjoining walls and level within 1:1000

3.5 Cleaning

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

.2 Touch up scratches, abrasions, voids and other defects in painted surfaces

End of Section

PART 1 GENERAL

1.1 General

.1 Conform to the requirements of Division 1.

1.2 Related Sections

.1 Section 03 30 00 Cast-in-Place Concrete
.2 Section 09 65 66 Indoor Athletic Surfacing
.3 Section 09 68 13 Carpet Tile

1.3 References

.1 ASTM International (ASTM)
  .1 ASTM E84-18b Standard Test Method for Surface Burning Characteristics of Building Materials
  .2 ASTM F710-17 Standard Practice for Preparing Concrete Floors to Receive Resilient Flooring
  .3 ASTM F1066-04(2018) Standard Specification for Vinyl Composition Floor Tile
  .4 ASTM F1344-15 Standard Specification for Rubber Floor Tile
  .5 ASTM F1861-16 Standard Specification for Resilient Wall Base
.2 Underwriters Laboratories of Canada (ULC)
  .1 ULC 102.2-2018 Method of Test for Surface Burning Characteristics of Flooring, Floor Coverings, and Miscellaneous Materials and Assemblies
.3 South Coast Air Quality Management District (SCAQMD), California State
  .1 SCAQMD Rule 1168-03, Adhesives and Sealants Applications.

1.4 Submittals

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

.2 Submit duplicate samples of manufacturer’s full range of colours for specified products for selection of colours by the Consultant.

.3 Before any resilient flooring materials are delivered to the job site, submit to the Consultant, a complete list of all materials proposed to be furnished and installed under this portion of the Work, stating manufacturer's name and catalogue number for each item, and product samples in colours specified.

.4 Accompanying the materials list, submit two copies of the manufacturer's current recommended method of installation for each item.

.5 Provide maintenance data for resilient flooring for incorporation into Operation and Maintenance Manual specified in Section 01 78 00 – Closeout Submittals.

1.5 Shipping, Handling and Storage

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

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

.3 Use all means necessary to protect resilient flooring materials before, during and after installation and to protect the installed work and materials of all other trades.

1.6 Extra Materials

.1 Provide extra stock materials of resilient flooring, base and adhesives in accordance with Section 01 78 00 – Closeout Submittals.

.2 Provide one carton of each colour, pattern and type flooring material required for this project for maintenance use.

.3 Provide one container of adhesive.

.4 Extra materials to be from same production run as installed materials.

.5 Clearly identify each container of floor tile and each container of adhesive.

1.7 Environmental Requirements

.1 Maintain air temperature and structural base temperature at floor installation area above 20° C for 48 hours before, during and after installation.

1.8 Waste Management and Disposal

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

1.9 Warranty

.1 Warrant the work of this Section against defects of workmanship and material, for a period of ten (10) years from the date of Substantial Performance and agree to make good promptly any defects which occur or become apparent within the warranty period.

PART 2 PRODUCTS

2.1 Materials

.1 Vinyl Composition Tile: to CSA A126.1 or ASTM F1066, 305 x 305 x 3.0 mm thick, non-asbestos, Class 2 through pattern tile with static load of not less than 517 kPa and U.L.C. flame spread rating of 75 or less.
  .1 LVT-1: Altro Quartz Tile 24x24, ROCK SALT CD 9302-Refer to Finish Schedule.
  .2 SF-1: Tarkett Commercial; Omnisports HPL with surface friction surface friction per the ASTM F2772. Greenlay Install format with (X3LT) Technology-Refer to Finishes Schedule
  .3 RB-1: Tarkett Commerical; Resilient Rubber Stair Stringers & Risers (Type TS) requirements of ASTM F-1861, Type TP, Group 1 (solid)-2mm

.2 Rubber Stair Treads: one piece tread/riser combination with raised square pattern, full width and depth of stair with speckled pattern and 50 mm wide colour contrasting abrasive carborundum grit tape on stair nosing to meet ADA standards. Treads shall have a tapering thickness of 5.3 mm to 3.9 mm across a depth of 330 mm with a 180 mm integral riser.
  .1 Johnsonite Roundel Rubber Model RTRSP.
  .2 Roppe Raised Design Rubber Treads.

.3 Resilient Base: To ASTM F1861, 100 mm high thermoplastic rubber, not less than 3.0 mm thickness with preformed internal and external corners. Base at resilient tile shall have standard toe.
.1 Johnsonite DuraCove DC Rubber Wall Base.

.4 Primers, Adhesives and Caulking: non-flammable, solvent free, waterproof, recommended by flooring manufacturer for specific material on applicable substrate, above, at or below grade.

.5 Sub-floor filler and leveler shall be white premixed latex compatible with flooring products and adhesive as recommended by flooring manufacturer for specific flooring types.

.6 Metal edge strips: aluminum extruded, smooth, mill finish with lip to extend under floor finish, shoulder flush with top of adjacent floor finish.

.7 Transition strips, mouldings and adaptors shall be rubber or vinyl, manufactured by Johnsonite, Roppe or Burke Mercer with lip to extend under floor tile with tapered edge, colour matched to flooring.

.8 Sealer: water based, type recommended by flooring manufacturer.

.9 Wax: type recommended by flooring manufacturer.

.10 All colours and patterns shall be as selected by the Consultant from the complete range of manufacturer's colours and patterns.

PART 3 EXECUTION

3.1 Surface Conditions

.1 Conform to requirements of ASTM F710.

.2 Prior to all work of this Section, carefully inspect the installed work of all other trades and verify that all such work is complete to the point where this installation may properly commence.

.3 Confirm that resilient flooring and base may be installed in accordance with the original design and the manufacturer's recommendations.

.4 Ensure concrete floors are dry, by using test methods recommended by tile manufacturer. Concrete must be cured a minimum of 35 days prior to commencement of resilient flooring application.

.5 In the event of discrepancy, immediately notify the Consultant.

.6 Do not proceed with installation in areas of discrepancy until all such discrepancies have been fully resolved.

3.2 Sub Floor Treatment

.1 Remove sub-floor ridges and bumps. Fill low spots, cracks, joints, holes and other defects with sub-floor filler.

.2 Install sub floor to manufacturer's recommended standard limits and deviations.

.3 Remove all substance and materials affecting adhesive bond.

.4 Vacuum clean floors.

.5 Clean floor and apply filler; trowel and float to leave smooth, flat hard surface. Prohibit traffic until filler is cured and dry.

.6 Prime or seal substrates to flooring and adhesive manufacturer’s instructions.

.7 Allow for excessive leveling of existing slabs.

3.3 Application

.1 Provide a high ventilation rate, with maximum outside air, during installation, and for 48 hours after installation. Whenever possible, ventilate directly to outside. Do not allow contaminated air to re-circulate through the building ventilation system.

.2 Install all resilient flooring in strict accordance with the manufacturer's printed instructions and recommendations.

.3 Do not lay floor coverings and base until all trades, except painter, have completed their work and just prior to completion of the building.

.4 Apply adhesive uniformly with recommended trowels, at coverage as recommended by the manufacturer. Do not spread more adhesive than can be covered before initial set takes place.

.5 Lay flooring with joints parallel to building lines unless otherwise indicated, to produce symmetrical tile pattern. Patterns shall be as directed by the consultant. Allow for one field tile and one accent tile in each room or space. Border tiles shall be minimum ½ tile width.

.6 Install flooring to square grid pattern with all joints aligned unless otherwise indicated.

.7 As installation progresses, and after installation, roll flooring in 2 directions with a 45 kg roller to ensure full adhesion.

.8 Cut and fit tile neatly around fixed objects.

.9 Install feature strips or feature tiles where directed. Fit joints tightly.

.10 Continue flooring throughout areas to receive movable type partitions or fitments without interrupting floor pattern.

.11 Install flooring full depth of closets, toe spaces, and recesses.

.12 Terminate flooring at centre line of door in openings where adjacent floor finish or colour is dissimilar.

.13 Install transition strips at unprotected or exposed edges where flooring terminates. Locate transition strip at centre line of door where a door occurs.

3.4 Stair Tread Application

.1 Install stair treads and risers in one piece, full width and height of stairs and risers in accordance with manufacturer's printed instructions. Adhere over entire surface and fit accurately.

.2 Caulk edges of nosings with epoxy caulking.

3.5 Base Application

.1 Lay out base to keep number of joints to a minimum. Locate joints at maximum available spacing or at internal or pre moulded corners.

.2 Clean substrate and prime with one coat of adhesive.

.3 Apply adhesive to back of base.

.4 Set base against wall and floor surfaces tightly by using a 3 kg hand roller.

.5 Install straight and level to variation of 1:1000.

.6 Scribe and fit to door frames and other obstructions. Use pre-moulded end pieces at flush door frames.

.7 Cope internal corners. Use pre moulded corner units for right angle external corners. Use formed straight base materials for external corners of other angles, minimum 300 mm each leg.

.8 Provide rubber base at all locations specified, regardless of floor finish.

3.6 Cleaning

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

.2 Remove excess adhesive from resilient floor coverings, base and adjacent finished surfaces as the work progresses.

.3 Clean, seal and wax floor and base surfaces to manufacturer's instructions. In carpeted areas, clean base before installation of carpet.

3.7 Protection

.1 Protect new floors until time of final inspection.

.2 Prohibit traffic on floors for 48 hours after installation.

.3 Immediately prior to final inspection, remove protection, clean, dry or damp mop resilient flooring and apply one additional coat of wax.

End of Section

PART 1 GENERAL

1.1 General

.1 Conform to the requirements of Division 1.

1.2 Related Sections

.1 Section 03 30 00 Cast-in-Place Concrete
.2 Section 09 21 16 Gypsum Board

1.3 References

.1 ASTM International (ASTM)
  .1 ASTM D543-20 Standard Practices for Evaluating the Resistance of Plastics to Chemical Reagents
  .2 ASTM D1894-14 Standard Test Method for Static and Kinetic Coefficients of Friction of Film and Sheeting.
  .3 ASTM D2240-15e1 Standard Test Method for Rubber Property—Durometer Hardness
  .4 ASTM E648-19ae1 Standard Test Method for Critical Radiant Flux of Floor-Covering Systems Using a Radiant Heat Energy Source
  .5 ASTM F710-19e1 Standard Practice for Preparing Concrete Floors to Receive Resilient Flooring
  .6 ASTM F970-17 Standard Test Method for Measuring Recovery Properties of Floor Coverings after Static Loading
  .7 ASTM F1303-04(2014) Standard Specification for Sheet Vinyl Floor Covering with Backing
  .8 ASTM F1869-16a Standard Test Method for Measuring Moisture Vapor Emission Rate of Concrete Subfloor Using Anhydrous Calcium Chloride
  .9 ASTM F2170-19a Standard Test Method for Determining Relative Humidity In Concrete Floor Slabs Using In-Situ Probes
  .10 ASTM F2772-11(2019) Standard Specification for Athletic Performance Properties of Indoor Sports Floor Systems.
.2 American Concrete Institute (ACI)
  .1 ACI 302.2R-06 Guideline for Concrete Slabs that Receive Moisture-Sensitive Flooring Materials.

1.4 Submittals

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

.2 Product Data:
  .1 Manufacturer’s promotional brochures, specifications and installation instructions.

.3 Shop Drawings:
  .1 Provide a seam diagram for approval prior to installation.

.4 Samples:
  .1 Submit for selection and approval three (3) sets of the indoor resilient multipurpose surfacing, manufacturer’s brochures, samples or sample boards of all of the available colours, textures and styles.

.5 Closeout Submittals:
.1 Submit manufacturer's maintenance instructions.
.2 Submit material and installation warranties as specified.

1.5 Quality Assurance

.1 Qualifications:
.1 The indoor resilient multipurpose surfacing shall be manufactured in an ISO 9001 certified plant.
.2 The indoor resilient multipurpose surfacing supplier shall be an established firm, experienced in the field, and appointed as a distributor by the manufacturer of the indoor resilient multipurpose surfacing.
.3 The installer of the indoor resilient multipurpose surfacing shall have a minimum of five (5) years of experience in the field installing indoor resilient multipurpose surfacing and have worked on at least five (5) projects of similar size, type and complexity.

.2 Certifications:
.1 Installer to submit the indoor resilient athletic surfacing manufacturer's certification attesting that they are an approved installer of the indoor resilient multipurpose surfacing.
.2 The indoor resilient multipurpose surfacing manufacturer to submit official ISO 9001 certification for the facility in which the indoor resilient multipurpose surfacing is manufactured.

.3 Testing:
.1 Tests shall be relative for multi-purpose use with certificates from independent testing resources to be made available upon request. Test results shall be no more than 5 years old and performed according to ASTM standard testing procedures.

1.6 Shipping, Handling and Storage

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

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

1.7 Project Site Conditions

.1 It is the responsibility of the general contractor/construction manager to maintain project/site conditions acceptable for the installation of the indoor resilient multipurpose flooring.

.2 The area in which the indoor resilient multipurpose surfacing will be installed shall be dry and weather tight. Permanent heat, light and ventilation shall be installed and operable.

.3 All other trades shall have completed their work prior to the installation of the resilient athletic flooring. The general contractor shall maintain a secure and clean working environment before, during and after the installation. Suspension of other trades' work may be authorized providing their work will not damage the new flooring.

.4 Maintain a stable room temperature of at least 18°C for a minimum of one (1) week prior to, during and thereafter installation.

.5 Concrete subfloor surface pH level within the 7 to 10 range dependent upon installation type.

.6 Concrete subfloor should be no greater than 3.0 mm within a 3.0 m diameter. This tolerance shall be measured in accordance with ASTM E1155. A specified (FF) of 50 and an (FL) of 30 should reach this degree of floor flatness and floor level. There is no numerical correlation between F numbers and the deviation from the straight edge, however the above specified numbers should achieve a flat floor with minimal deviation in the slab. Reference ACI 117 and ACI 302.1R. The general contractor should provide a certificate of compliance with the above recommendations.

.7 Concrete subfloor must be clean and free of all foreign materials or objects including, but not limited to, curing compounds and sealers.

.8 Fill cracks, grooves, voids, depressions, and other minor imperfections. Follow the manufacturer's directions. Moveable joints must be treated utilizing specific transitioning joint devices depending upon the Consultant's recommendations. Follow current ASTM F710 guidelines for the preparation of concrete slabs to receive resilient flooring.

.9 Refer to ACI 302.2R "Guidelines for Concrete Slabs that Receive Moisture-Sensitive Flooring Materials" for concrete design and construction.

1.8 Additional Materials

.1 Furnish to the owner additional materials containing a total of at least 2% of each different colour or design of the indoor resilient athletic surfacing used on the project.

1.9 Waste Management and Disposal

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

1.10 Warranty

.1 Warrant the work of this Section against defects of workmanship and material, for a period of two years from the date of Substantial Performance and agree to make good promptly any defects which occur or become apparent within the warranty period.

.2 For material defects and surface wear-through: 15 years from date of substantial completion.

.3 For moisture va or tolerance: 15 years from da te of substantial completion.

PART 2 PRODUCTS

2.1 Manufacturers

.1 The basis of the design for the indoor resilient multipurpose surfacing is Omnisports HPL 7 mm as manufactured by Tarkett.

.2 All other installation accessories and related components must be either made or approved by the indoor resilient athletic surfacing manufacturer.

.3 Other products may be approved as equal if deemed qualified and submitted in accordance with the General Conditions.

.4 Test reports confirming compliance from an independent sports laboratory must be provided along with samples, technical data, installation, maintenance, and warranty prior to acceptance as an alternative product.

.5 Acceptable Alternative:
.1 Robbins Pulastic - 2000 as distributed by Gym-Con Limited.
.2 Polyflor

2.2 Materials

.1 Omnisports HPL 7 mm - Prefabricated sport surface with wood flooring design and slightly textured embossed surface as supplied by Tarkett.
.1 Embossing of wood design and solid colors must be the same; varying embossing or surface textures will not be allowed.
.2 Printing of wood design shall closely resemble standard wood strip flooring in size, color, board length, and grain appearance.
.3 The wood design shall be protected by a clear layer of pure PVC (Polyvinyl Chloride) and TopClean xp, a factory-applied UV cured urethane treatment. 4. Intermediate layers shall be fortified with a non-woven fiberglass grid for increased dimensional stability.
.4 A high density load resistant underlayment, field constructed and installed per manufacturer's construction specifications incorporated to provide higher load resistance.

.2 Physical properties of the indoor resilient athletic surfacing shall conform to the following minimums:

Width	Omnisports	6' 6" (2 m)
Length	Omnisports	85' (25.9m) approx.
Wear Layer	Omnisports	2 mm
Total Thickness	Omnisports HPL	7 mm (5 + 2)
High Density Underlayment	ASTM D297	0.67 g/cm 3
Tear Strength	ASTM D412	410-425 min. Die C
Elongation	ASTM D412	120-125 min. Die C
Static Load	ASTM F970	500 psi
Reaction to Fire	ASTM E648	Class 1
Specular Gloss	EN ISO 2813	13%
Wear Layer	Type 1, Grade 1	ASTM F1303/F410
Taber Abrasion	ASTM D3389	0.02 a (1000 cycles)
Stain Resistance	ASTM F925	Excellent
Moisture Tolerance with Multi-Poxy	ASTM F2170	98% RH
Vertical Deformation	PASSED	ASTM F2772
Surface Finish Effect	PASSED	ASTM F2772 (80 - 100)
Ball Rebound	PASSED	ASTM F2772 >90%
Force Reduction	PASSED	ASTM F2772 Class 1
Phthalate-free technology		YES
REACH Compliant	-	YES
Heavy Metals	-	NO
ISO 9001	-	YES
ISO 14001	-	YES

.1 Color: As available from the indoor resilient athletic surfacing manufacturer's standard range.

.2 Hardwood Design Series: A wood look design as available from the indoor resilient athletic surfacing manufacturer's standard range.
.3 Texture: Texture to remain consistent between solid colors and wood design when blending colors.

.3 Welding Rod: As supplied by the indoor resilient athletic surfacing manufacturer or supplier.
.1 Color to blend with the indoor resilient athletic surfacing color or design.
.2 All seams shall be welded to create a monolithic and impermeable surface.

.4 Adhesive: As approved by the indoor resilient athletic surfacing manufacturer.

.5 Game Line Paint and Primer: As approved by the indoor resilient athletic surfacing manufacturer.

PART 3 EXECUTION

3.1 Examination

.1 Ensure that project/site conditions are acceptable for the installation of the indoor resilient athletic flooring.

.2 Verify that the area in which the indoor resilient athletic surfacing will be installed is dry and weather tight. Verify that permanent heat, light and ventilation is installed and operable.

.3 Verify that all other work that could cause damage, dirt and dust or interrupt the normal pace of the indoor resilient athletic flooring installation is completed or suspended.

.4 Verify that there is a stable room temperature of at least 18°C.

.5 Verify that there are no foreign materials or objects on the subfloor and that the subfloor is clean and ready for installation.

.6 Moisture content less than 92% RH when tested per ASTM F2170.
.7 Do not average the results of the tests. Report all field test results in writing to the Consultant, and Owner prior to installation.

.8 Verify that the concrete subfloor surface pH level is within the 7 - 11 range.

.9 Document the results indicating the slab is within manufacturer’s tolerances for slab deviation.

3.2 Preparation

.1 Clean existing floor slab of all materials and adhesives.

.2 Sand the entire surface of the concrete slab. Provide surface treatment including filler and levelling compounds as required and in accordance with manufacturer’s recommendations.

.3 Sweep the concrete slab so as to remove all dirt and dust. If a sweeping compound is to be used it must be a sweeping compound that does not contain oil or other items that may inhibit the adhesive bond.

.4 Slab must be dust free. In the event that dust impairs adhesive bond, priming the slab prior to application of adhesive may be necessary. Follow installation guidelines.

3.3 Installation

.1 The installation area shall be closed to all traffic. The installation shall not begin until the installer is familiar with the existing conditions.

.2 All necessary precautions should be taken to minimize noise, smell, dust, the use of hazardous materials and any other items that may inconvenience others.

.3 Indoor athletic surfacing shall be installed in a full bed of adhesive. Perimeter adhesive only is not permitted and will not be accepted.

.4 Install the indoor resilient athletic surfacing in strict accordance with the manufacturer's written instructions.

.5 Install the indoor resilient athletic surfacing minimizing cross seams.

.6 Install appropriate threshold plates or transition strips where necessary.

3.4 Protection

.1 Protect the indoor resilient athletic surfacing from damage using coverings approved by the manufacturer until Substantial Performance.

3.5 Cleaning

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

.2 Remove all unused materials, tools, and equipment and dispose of any debris properly. Clean the indoor resilient athletic surfacing in accordance with the manufacturer's instructions.

End of Section

PART 1 GENERAL

1.1 General

.1 Conform to the requirements of Division 1.

1.2 Related Sections

.1 Section 03 30 00 Cast-in-Place Concrete

1.3 References

.1 American Concrete Institute (ACI)
  .1 ACI 308 Standard Specification for Curing Concrete

1.4 Submittals

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

.2 Product data: Submit manufacturer's Product data indicating:
  .1 Product characteristics, performance criteria, and limitations.
  .2 Preparation, installation requirements and techniques, Product storage, and handling criteria.

.3 Samples: Submit minimum 300 x 300 mm samples indicating coating and final concrete finish.

.4 Reports: Submit manufacturer's acceptance of substrate prior to installation in writing. Submit verification of moisture content of floor prior to installation.

.5 Provide maintenance data for concrete floor sealer for incorporation into Operating and Maintenance Manuals specified in Section 01 78 00- Closeout Submittals.

1.5 Quality Assurance

.1 Perform Work of this Section by a company that has a minimum of five years proven experience in installations of a similar size and nature and that is approved by manufacturer. Submit to Consultant, applicator’s current certificate of approval by the material manufacturer as proof of compliance.

.2 Mock-up:
  .1 Construct one 10 m^2 mock-up of floor sealer in location acceptable to Consultant.
  .2 Arrange for Consultant's review and acceptance, allow 48 hours after acceptance before proceeding with Work.
  .3 Mock-up may remain as part of Work if accepted by Consultant. If sealer application is unacceptable to Consultant, rework sealer in accordance with manufacturer’s recommendations to provide a sealed concrete surface acceptable to Consultant.
  .4 Upon acceptance, mock-up shall serve as a minimum standard of quality for the balance of the work of this Section.

1.6 Project Conditions

.1 Do not install the Work of this Section outside of environmental ranges as recommended by the manufacturer without manufacturer's written acceptance and as follows:
  .1 Relative Humidity: In accordance with manufacturers' requirements.

.2 When no dust is being raised.
.3 In well-ventilated and broom clean areas.

.2 Install temporary protection and facilities to maintain the product manufacturer's and specified environmental requirements for 24 hours before, during, and 24 hours after installation.

.3 Post do not enter and appropriate warning signs at conspicuous locations.

1.7 Shipping, Handling and Storage

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

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

.3 Store materials at site in an area specifically set aside for purpose that is locked, ventilated, and maintained at a minimum temperature of 16 ° C.

.4 Ensure that health and fire regulations are complied with in storage area, and during handling and application.

1.8 Waste Management and Disposal

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

1.9 Warranty

.1 Warrant the work of this Section against defects of workmanship and material, for a period of two years from the date of Substantial Performance and agree to make good promptly any defects which occur or become apparent within the warranty period.

PART 2 PRODUCTS

2.1 Materials

.1 All materials including sealers and coatings are to have low VOC content limits.

.2 Each material used in the application of each flooring system shall be as recommended or manufactured by the supplier of the flooring system.

.3 Concrete floor sealer: Alkali-silicate, water-soluble, inorganic concrete hardener and dustproofer; MasterKure HD 200WB by BASF Building Systems or approved alternative by Euclid or Sika Canada Inc.

.4 Colour: clear

PART 3 EXECUTION

3.1 Examination

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

.2 Verify that concrete floors have cured 28 days minimum and that substrate is acceptable to sealer manufacturer.

.3 Test surfaces for moisture content to ensure that they are suitable for application.

3.2 Preparation

.1 Prepare substrate in accordance with manufacturer's written instructions. Diamond grind and vacuum substrate free of debris and dust.

.2 Project adjacent surfaces from damage resulting from Work of this section. Mask and/or cover adjacent surfaces, fixtures, and equipment as necessary.

3.3 Application

.1 Spray apply concrete sealer to entire surface and keep from drying for 30 minutes as recommended by manufacturer.

.2 Sprinkle surface with water as sealer begins to penetrate (after 30 minutes).

.3 Flush surface with water and drying begins to remove excess material. Allow to harden for 24 hours.

.4 Lightly buff floor with a commercial floor buffer and non-aggressive pad to bring up required sheen.

3.4 Protection

.1 Erect barriers to prevent the entry and presence of personnel not performing work of this Section during application of floor sealer, and for 48 hours following completion of application.

3.5 Cleaning

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

.2 Remove promptly as work progresses spilled or spattered materials from surfaces of work performed under other Sections. Clean floors on completion of work. Do not mar surfaces while removing.

End of Section

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PART 1 GENERAL

1.1 General

.1 Conform to the requirements of Division 1.

1.2 Related Sections

.1 Section 09 91 23 Interior Painting

1.3 References

.1 ASTM International (ASTM)
  .1 ASTM A780/A780M-09(2015) Standard Practice for Repair of Damaged and Uncoated Areas of Hot-Dip Galvanized Coatings
.2 Environmental Protection Agency (EPA)
  .1 Test Method for Measuring Total Volatile Organic Compound Content of Consumer Products, Method 24 (for Surface Coatings).
.3 Master Painters Institute (MPI)
  .1 MPI Architectural Painting Specifications Manual, 2018.
  .2 Standard GPS-1-08 and GPS-2-08 MPI Green Performance Standard for Painting and Coatings.
.4 Society for Protective Coatings (SSPC)
  .1 Systems and Specifications, SSPC Painting Manual 2009.
.5 South Coast Air Quality Management District, California State (SCAQMD)
  .1 SCAQMD Rule 1113-96 Architectural Coatings.
.6 Green Seal GS-11 Green Seal Environmental Standard for Paints and Coatings, January 1997.
.7 National Fire Code of Canada.

1.4 Submittals

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

.2 Product Data: ubmit manufacturer's printed product literature, specifications and datasheet and include product characteristics, performance criteria, physical size, finish and limitations.

.3 Samples:
  .1 Submit full range colour sample chips to indicate where colour availability is restricted.
  .2 Submit duplicate 200 x 300 mm sample panels of each paint, stain, clear coating and special finish with specified paint or coating in colours, gloss/sheen and textures required to MPI Architectural Painting Specification Manual standards.
  .3 Retain reviewed samples on-site to demonstrate acceptable standard of quality for appropriate on-site surface.

.4 Certificates: submit certificates signed by manufacturer certifying that materials comply with specified performance characteristics and physical properties and SCAQMD Rule 1113-96.

.5 Provide maintenance data for paint products for incorporation into Operating and Maintenance Manuals specified in Section 01 78 00- Closeout Submittals. Include following:
  .1 Product name, number, type and use.
  .2 Colour numbers.
  .3 MPI Environmentally Friendly classification system rating.

1.5 Quality Assurance

.1 Qualifications:
  .1 Contractor: to have a minimum of five years proven satisfactory experience. When requested, provide list of last three comparable jobs including, job name and location, specifying authority, and project manager.
  .2 Qualified journeypersons as defined by local jurisdiction to be engaged in painting work.
  .3 Apprentices: may be employed provided they work under direct supervision of qualified journeyperson in accordance with trade regulations.

.2 Conform to latest MPI requirements for exterior painting work including preparation and priming.

.3 Paint materials to be highest quality product of an approved manufacturer listed in MPI Painting Specification Manual and to be compatible with other coating materials as required.

.4 Retain purchase orders, invoices and documents to prove conformance with noted MPI requirements when requested by Consultant.

.5 Provide mock-up in accordance with Section 01 45 00 - Quality Control.
  .1 Prepare and paint designated surface, area, room or item (in each colour scheme) to specified requirements, with specified paint or coating showing selected colours, gloss/sheen and textures. Locate where directed.
  .2 Mock-up will be used to judge workmanship, substrate preparation, operation of equipment and material application and workmanship to MPI Architectural Painting Specification Manual standards.
  .3 Allow 24 hours for inspection of mock-up before proceeding with work.
  .4 When accepted, mock-up will demonstrate minimum standard of quality required for this work. Approved mock-up may remain as part of finished work.

1.6 Shipping, Handling and Storage

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

.2 Deliver and store materials in original containers, sealed, with labels intact. Labels to indicate:
  .1 Manufacturer's name and address.
  .2 Type of paint or coating.
  .3 Compliance with applicable standard.
  .4 Colour number in accordance with established colour schedule.

.3 Provide and maintain dry, temperature controlled, secure storage. Store materials and equipment in well-ventilated area with temperature range 7 °C to 30 °C. Store materials and supplies away from heat generating devices.

.4 Observe manufacturer's recommendations for storage and handling.

.5 Keep areas used for storage, cleaning and preparation, clean and orderly. After completion of operations, return areas to clean condition.

.6 Remove paint materials from storage only in quantities required for same day use.

.7 Comply with requirements of Workplace Hazardous Materials Information System (WHMIS) regarding use, handling storage, and disposal of hazardous materials.

.8 Remove damaged, opened and rejected materials from site.

1.7 Fire Safety Requirements

.1 Provide one 9 kg Type ABC dry chemical fire extinguisher adjacent to storage area.

.2 Store oily rags, waste products, empty containers and materials subject to spontaneous combustion in ULC approved, sealed containers and remove from site on a daily basis.

.3 Handle, store, use and dispose of flammable and combustible materials in accordance with the National Fire Code of Canada.

1.8 Waste Management and Disposal

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

.2 Place materials defined as hazardous or toxic in designated containers. Handle and dispose of hazardous materials in accordance with Municipal regulations.

.3 Unused materials must be disposed of at official hazardous material collections site.

.4 Paint and related materials are regarded as hazardous products and are subject to regulations for disposal. Information on these controls can be obtained from the Ministry of the Environment.

.5 Material which cannot be reused must be treated as hazardous waste and disposed of in an appropriate manner.

.6 Place materials defined as hazardous or toxic waste in containers or areas designated for hazardous waste.

1.9 Maintenance

.1 Extra Materials:
  .1 Submit maintenance materials in accordance with Section 01 78 00 - Closeout Submittals.
  .2 Quantity: provide one four litre can of each type and colour of finish coating. Identify colour and paint type in relation to established colour schedule and finish system.
  .3 Deliver to Owner and store where directed.

1.10 Ambient Conditions

.1 Heating, Ventilation and Lighting:
  .1 Ventilate enclosed spaces in accordance with Section 01 51 00 – Temporary Utilities.
  .2 Do not perform painting work unless adequate and continuous ventilation and sufficient heating facilities are in place to maintain ambient air and substrate temperatures above 10 °C for 24 hours before, during and after paint application until paint has cured sufficiently.
  .3 Provide continuous ventilation for seven days after completion of application of paint
  .4 Provide minimum lighting level of 323 Lux on surfaces to be painted.

.2 Temperature, Humidity and Substrate Moisture Content Levels:
  .1 Unless specifically pre-approved by Consultant and product manufacturer, perform no painting work when:
    .1 Ambient air and substrate temperatures are below 10 °C.
    .2 Substrate temperature is over 32 °C unless paint is specifically formulated for application at high temperatures.

.3 Substrate and ambient air temperatures are expected to fall outside MPI or paint manufacturer's prescribed limits.
.4 Relative humidity is above 85 % or when dew point is less than 3 °C variance between air/surface temperature.
.5 Rain or snow are forecast to occur before paint has thoroughly cured or when it is foggy, misty, raining or snowing at site.

.2 Perform no painting work when maximum moisture content of substrate exceeds 12%.
.3 Conduct moisture tests using a properly calibrated electronic Moisture Meter.
.4 Test concrete surfaces for alkalinity as required.

.3 Surface and Environmental Conditions:
.1 Apply paint finish in areas where dust is no longer being generated by related construction operations or when wind or ventilation conditions are such that airborne particles will not affect quality of finished surface.
.2 Apply paint to adequately prepared surfaces and to surfaces within moisture limits noted herein.
.3 Apply paint when previous coat of paint is dry or adequately cured.
.4 Apply paint finishes when conditions forecast for entire period of application fall within manufacturer's recommendations.
.5 Do not apply paint when:
.1 Temperature is expected to drop below 10 °C before paint has thoroughly cured.
.2 Substrate and ambient air temperatures are expected to fall outside MPI or paint manufacturer's limits.
.3 Surface to be painted is wet, damp or frosted.
.6 Provide and maintain cover when paint must be applied in damp or cold weather. Heat substrates and surrounding air to comply with temperature and humidity conditions specified by manufacturer. Protect until paint is dry or until weather conditions are suitable.
.7 Schedule painting operations such that surfaces exposed to direct, intense sunlight are scheduled for completion during early morning.
.8 Remove paint from areas which have been exposed to freezing, excess humidity, rain, snow or condensation. Prepare surface again and repaint.

PART 2 PRODUCTS

2.1 Materials

.1 Paint materials listed in latest edition of MPI Approved Products List (APL) and from a single manufacturer for each system used are acceptable for use on this project.

.2 Paint materials for paint systems: to be products of single manufacturer.

.3 Only qualified products with E2 or E3 "Environmentally Friendly" ratings are acceptable for use on this project.

.4 Use only MPI listed ‘L’ rated materials.

.5 Paints, coatings, adhesives, solvents, cleaners, lubricants, and other fluids, to be as follows:
.1 Be water-based water soluble water clean-up.
.2 Be non-flammable biodegradable.
.3 Be manufactured without compounds which contribute to ozone depletion in upper atmosphere.
.4 Be manufactured without compounds which contribute to smog in the lower atmosphere.
.5 Do not contain methylene chloride, chlorinated hydrocarbons, toxic metal pigments.

.6 Water-borne surface coatings must be manufactured and transported in a manner that steps of processes, including disposal of waste products arising therefrom, will meet requirements of applicable governmental acts, by-laws and regulations including Fisheries Act and Canadian Environmental Protection Act (CEPA).

.7 Water-borne surface coatings must not be formulated or manufactured with aromatic solvents, formaldehyde, halogenated solvents, mercury, lead, cadmium, hexavelant chromium or their compounds.

.8 Water-borne surface coatings and recycled water-borne surface coatings must have flash point of 61 °C or greater.

.9 Both water-borne surface coatings and recycled water-borne surface coatings must be made by a process that does not release:
- .1 Matter in undiluted production plant effluent generating a 'Biochemical Oxygen Demand' (BOD) in excess of 15 mg/L to a natural watercourse or a sewage treatment facility lacking secondary treatment.
- .2 Total Suspended Solids (TSS) in undiluted production plant effluent in excess of 15 mg/L to a natural watercourse or a sewage treatment facility lacking secondary treatment.

.10 Water-borne paints and stains, recycled water-borne surface coatings and water borne varnishes must meet a minimum "Environmentally Friendly" E2 or E3 rating.

.11 Recycled water-borne surface coatings must contain 50 % post-consumer material by volume.

.12 Recycled water-borne surface coatings must not contain:
- .1 Lead in excess of 600.0 ppm weight/weight total solids.
- .2 Mercury in excess of 50.0 ppm weight/weight total product.
- .3 Cadmium in excess of 1.0 ppm weight/weight total product.
- .4 Hexavelant chromium in excess of 3.0 ppm weight/weight total product.
- .5 Organochlorines or polychlorinated biphenyls (PCBS) in excess of 1.0 ppm weight/weight total product.

.13 The following must be performed on each batch of consolidated post-consumer material before surface coating is reformulated and canned. These tests must be performed at a laboratory or facility which has been accredited by the Standards Council of Canada.
- .1 Lead, cadmium and chromium are to be determined using ICP-AES (Inductively Coupled Plasma - Atomic Emission Spectroscopy) technique no. 6010 as defined in EPA SW-846.
- .2 Mercury is to be determined by Cold Vapour Atomic Absorption Spectroscopy using Technique no. 7471 as defined in EPA SW-846.
- .3 Organochlorines and PCBs are to be determined by Gas Chromatography using Technique no. 8081 as defined in EPA SW-846.

2.2 Colours

.1 Consultant will provide Colour Schedule.

.2 Exterior colour schedule will be based upon selection of three base colours and two deep tint accent colours.

.3 Selection of colours will be from manufacturer’s full range of colours.

.4 Where specific products are available in restricted range of colours, selection will be based on limited range.

.5 Second coat in three coat system to be tinted slightly lighter colour than top coat to show visible difference between coats.

2.3 Mixing and Tinting

.1 Perform colour tinting operations prior to delivery of paint to site.

.2 Mix paste, powder or catalyzed paint mixes in accordance with manufacturer's written instructions.

.3 Add thinner to paint manufacturer's recommendations. Do not use kerosene or organic solvents to thin water-based paints.

.4 Thin paint for spraying according in accordance with paint manufacturer's instructions. If directions are not on container, obtain instructions in writing from manufacturer and provide copy of instructions to Consultant.

.5 Re-mix paint in containers prior to and during application to ensure break-up of lumps, complete dispersion of settled pigment, and colour and gloss uniformity.

2.4 Gloss/Sheen Ratings

.1 Paint gloss: defined as sheen rating of applied paint, in accordance with following values:

Gloss Level Category/	Units @ 60 Degrees	Units @ 85 Degrees
G1 – matte finish	0 to 5	Max. 10
G2 – velvet finish	0 to 10	10 to 35
G3 – eggshell finish	10 to 25	10 to 35
G4 – satin finish	20 to 35	Min. 35
G5 – semi-gloss finish	35 to 70	
G6 – gloss finish	70 to 85	
G7 – high gloss finish	> 85	

.2 Gloss level ratings of painted surfaces as specified.

2.5 Exterior Painting Systems

.1 Asphalt Surfaces: Refer to Section 32 17 23 for pavement markings.

.2 Steel Doors, Frames and Metal Fabrications:
.1 EXT 5.1D – Alkyd G5 semi-gloss finish over alkyd primer.

PART 3 EXECUTION

3.1 General

.1 Perform preparation and operations for painting in accordance with MPI Architectural Painting Specifications Manual except where specified otherwise.

.2 Compliance: comply with manufacturer's written recommendations or specifications, including product technical bulletins, handling, storage and application instructions, and data sheets.

3.2 Examination

.1 Investigate existing substrates for problems related to proper and complete preparation of surfaces to be painted. Report to Consultant damages, defects, unsatisfactory or unfavourable conditions before proceeding with work.

3.3 Preparation

.1 Perform preparation and operations for exterior painting in accordance with MPI Maintenance Repainting Manual except where specified otherwise.

.2 Clean and prepare exterior surfaces to be repainted in accordance with MPI Maintenance Repainting Manual requirements. Refer to the MPI Manual in regard to specific requirements and as follows:
- .1 Remove dust, dirt, and surface debris by vacuuming, wiping with dry, clean cloths or compressed air.
- .2 Wash surfaces with a biodegradable detergent and bleach where applicable and clean warm water using a stiff bristle brush to remove dirt, oil and other surface contaminants.
- .3 Rinse scrubbed surfaces with clean water until foreign matter is flushed from surface.
- .4 Allow surfaces to drain completely and allow to dry thoroughly. Allow sufficient drying time and test surfaces using electronic moisture meter before commencing work.
- .5 Use water-based cleaners in place of organic solvents where surfaces will be repainted using water based paints.
- .6 Many water-based paints cannot be removed with water once dried. Minimize use of kerosene or such organic solvents to clean up water-based paints.

.3 Clean metal surfaces to be repainted by removing rust, dirt, oil, grease and foreign substances in accordance with MPI requirements and SSPC-SP 6. Remove such contaminates from surfaces, pockets and corners to be repainted by brushing with clean brushes, blowing with clean dry compressed air, or brushing/vacuum cleaning as required.

.4 Prevent contamination of cleaned surfaces by salts, acids, alkalis, other corrosive chemicals, grease, oil and solvents before priming and between applications of remaining coats. Touch-up, spot prime, and apply primer, paint, or pretreatment as soon as possible after cleaning and before deterioration occurs.

3.4 Protection

.1 Protect existing building surfaces and adjacent structures from paint spatters, markings and other damage by suitable non-staining covers or masking. If damaged, clean and restore such surfaces.

.2 Protect items that are permanently attached such as Fire Labels on doors and frames.

.3 Remove light fixtures, surface hardware on doors, and other surface mounted equipment, fittings and fastenings prior to undertaking painting operations. Store items and re-install after painting is completed.

.4 Protect factory finished products and equipment.

.5 As painting operations progress, place "WET PAINT" signs in pedestrian and vehicle traffic areas.

3.5 Application

.1 Apply paint materials in accordance with paint manufacturer's written application instructions.

.2 Brush and Roller Application:
- .1 Apply paint in a uniform layer using brush and/or roller of types suitable for application.
- .2 Work paint into cracks, crevices and corners.
- .3 Paint surfaces and corners not accessible to brush using spray, daubers and/or sheepskins. Paint surfaces and corners not accessible to roller using brush, daubers or sheepskins.
- .4 Brush and/or roll out runs and sags, and over-lap marks. Rolled surfaces shall be free of roller tracking and heavy stipple unless approved by Consultant.
- .5 Remove runs, sags and brush marks from finished work and repaint.

.3 Use dipping, sheepskins or daubers when no other method is practical in places of difficult access and when specifically authorized by Consultant.

.4 Apply coats of paint as continuous film of uniform thickness. Repaint thin spots or bare areas before next coat of paint is applied.

.5 Allow surfaces to dry and properly cure after cleaning and between subsequent coats for minimum time period as recommended by manufacturer.

.6 Sand and dust between coats to remove visible defects.

.7 Finish surfaces both above and below sight lines as specified for surrounding surfaces, including such surfaces as projecting ledges.

.8 Finish top, bottom, edges and cutouts of doors after fitting as specified for door surfaces.

3.6 Mechanical/Electrical Equipment

.1 Unless otherwise specified, paint exterior exposed conduits, piping, hangers, duct work and other mechanical and electrical equipment with colour and finish to match adjacent surfaces.

.2 Touch up scratches and marks on factory painted finishes and equipment with paint as supplied by manufacturer of equipment.

.3 Do not paint over nameplates.

3.7 Field Quality Control

.1 Provide manufacturer's field services consisting of product use recommendations and periodic site visits for inspection of product installation in accordance with manufacturer's instructions.

.2 Standard of Acceptance:
- .1 Walls: no defects visible from a distance of 1000 mm at 90 degrees to surface.
- .2 Ceilings: no defects visible from floor at 45 degrees to surface when viewed using final lighting source.
- .3 Final coat to exhibit uniformity of colour and uniformity of sheen across full surface area.

3.8 Cleaning

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

.2 Remove paint where spilled, splashed, splattered or sprayed as work progresses using means and materials that are not detrimental to affected surfaces.

3.9 Restoration

.1 Clean and re-install hardware items removed before undertaken painting operations.

.2 Remove protective coverings and warning signs as soon as practical after operations cease.

.3 Protect freshly completed surfaces from paint droppings and dust to approval of Consultant. Avoid scuffing newly applied paint.

End of Section

PART 1 GENERAL

1.1 General

.1 Conform to the requirements of Division 1.

1.2 Related Sections

.1 Section 05 12 23 Structural Steel
.2 Section 05 21 00 Steel Joists
.3 Section 05 31 00 Steel Deck
.4 Section 05 50 00 Metal Fabrications
.5 Section 06 20 00 Finish Carpentry
.6 Section 08 11 00 Metal Doors and Frames
.7 Section 08 14 16 Flush Wood Doors
.8 Section 09 21 16 Gypsum Board
.9 Section 09 91 13 Exterior Painting

1.3 References

.1 ASTM International (ASTM)
  .1 ASTM A780/A780M-09(2015) Standard Practice for Repair of Damaged and Uncoated Areas of Hot-Dip Galvanized Coatings
.2 Environmental Protection Agency (EPA)
  .1 Test Method for Measuring Total Volatile Organic Compound Content of Consumer Products, Method 24 (for Surface Coatings).
.3 Master Painters Institute (MPI)
  .1 MPI Architectural Painting Specifications Manual, 2018
  .2 Standard GPS-1-08 and GPS-2-08 MPI Green Performance Standard for Painting and Coatings.
.4 Society for Protective Coatings (SSPC)
  .1 Systems and Specifications, SSPC Painting Manual 2009
.5 Underwriters Laboratories of Canada (ULC)
  .1 ULC 102-18 Standard Method of Test for Surface Burning Characteristics of Building Materials and Assemblies
.6 South Coast Air Quality Management District, California State (SCAQMD)
  .1 SCAQMD Rule 1113-96, Architectural Coatings.
.7 Green Seal GS-11 Green Seal Environmental Standard for Paints and Coatings, January 1997.
.8 National Fire Code of Canada

1.4 Submittals

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

.2 Product Data:
  .1 Submit manufacturer's printed product literature, specifications and datasheet and include product characteristics, performance criteria, physical size, finish and limitations.

.3 Samples:
  .1 Submit full range colour sample chips.
  .2 Submit duplicate 200 x 300 mm sample panels of each paint, stain, clear coating and special finish with specified paint or coating in colours, gloss/sheen and textures required to MPI Architectural Painting Specification Manual standards.

.3 Retain reviewed samples on-site to demonstrate acceptable standard of quality for appropriate on-site surface.

.4 Certificates: submit certificates signed by manufacturer certifying that materials comply with specified performance characteristics and physical properties and SCAQMD Rule 1113-96.

.5 Provide maintenance data for paint products for incorporation into Operating and Maintenance Manuals specified in Section 01 78 00- Closeout Submittals. Include following:
.1 Product name, number, type and use.
.2 Colour numbers.
.3 MPI Environmentally Friendly classification system rating.

1.5 Quality Assurance

.1 Qualifications:
.1 Contractor: to have a minimum of five years proven satisfactory experience.
.2 Qualified journeypersons as defined by local jurisdiction to be engaged in painting work.
.3 Apprentices: may be employed provided they work under direct supervision of qualified journeyperson in accordance with trade regulations.

.2 Conform to latest MPI requirements for painting work including preparation and priming.

.3 Materials: in accordance with MPI Painting Specification Manual "Approved Product" listing and from a single manufacturer for each system used.

.4 Paint materials to be highest quality product of an approved manufacturer listed in MPI Painting Specification Manual and to be compatible with other coating materials as required.

.5 Retain purchase orders, invoices and documents to prove conformance with noted MPI requirements when requested by Consultant.

.6 Provide mock-up in accordance with Section 01 45 00 - Quality Control.
.1 Prepare and paint designated surface, area, room or item (in each colour scheme) to specified requirements, with specified paint or coating showing selected colours, gloss/sheen and textures. Locate where directed.
.2 Mock-up will be used to judge workmanship, substrate preparation, operation of equipment and material application and workmanship to MPI Architectural Painting Specification Manual standards.
.3 Allow 24 hours for inspection of mock-up before proceeding with work.
.4 When accepted, mock-up will demonstrate minimum standard of quality required for this work. Approved mock-up may remain as part of finished work.

1.6 Shipping, Handling and Storage

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

.2 Deliver and store materials in original containers, sealed, with labels intact. Labels to indicate:
.1 Manufacturer's name and address.
.2 Type of paint or coating.
.3 Compliance with applicable standard.
.4 Colour number in accordance with established colour schedule.

.3 Provide and maintain dry, temperature controlled, secure storage. Store materials and equipment in well-ventilated area with temperature range 7 ° C to 30 ° C. Store materials and supplies away from heat generating devices.

.4 Observe manufacturer's recommendations for storage and handling.

.5 Keep areas used for storage, cleaning and preparation, clean and orderly. After completion of operations, return areas to clean condition.

.6 Remove paint materials from storage only in quantities required for same day use.

.7 Comply with requirements of Workplace Hazardous Materials Information System (WHMIS) regarding use, handling storage, and disposal of hazardous materials.

.8 Remove damaged, opened and rejected materials from site.

1.7 Fire Safety Requirements

.1 Provide one 9 kg Type ABC dry chemical fire extinguisher adjacent to storage area.

.2 Store oily rags, waste products, empty containers and materials subject to spontaneous combustion in ULC approved, sealed containers and remove from site on a daily basis.

.3 Handle, store, use and dispose of flammable and combustible materials in accordance with National Fire Code of Canada requirements.

1.8 Waste Management and Disposal

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

.2 Place materials defined as hazardous or toxic in designated containers. Handle and dispose of hazardous materials in accordance with Municipal regulations.

.3 Unused materials must be disposed of at official hazardous material collections site.

.4 Paint and related materials are regarded as hazardous products and are subject to regulations for disposal. Information on these controls can be obtained from the Ministry of the Environment.

.5 Material which cannot be reused must be treated as hazardous waste and disposed of in an appropriate manner.

.6 Place materials defined as hazardous or toxic waste in containers or areas designated for hazardous waste.

1.9 Maintenance

.1 Extra Materials:
  .1 Submit maintenance materials in accordance with Section 01 78 00 - Closeout Submittals.
  .2 Quantity: provide one four litre can of each type and colour of finish coating. Identify colour and paint type in relation to established colour schedule and finish system.
  .3 Deliver to Owner and store where directed.

1.10 Ambient Conditions

.1 Heating, Ventilation and Lighting:
  .1 Ventilate enclosed spaces in accordance with Section 01 51 00 – Temporary Utilities.
  .2 Provide heating facilities to maintain ambient air and substrate temperatures above 10 ° C for 24 hours before, during and after paint application until paint has cured sufficiently.
  .3 Provide continuous ventilation for seven days after completion of application of paint.
  .4 Provide temporary ventilating and heating equipment where permanent facilities are not available or supplemental ventilating and heating equipment if ventilation and heating from existing system is inadequate to meet minimum requirements.
  .5 Provide minimum lighting level of 323 Lux on surfaces to be painted.

.2 Temperature, Humidity and Substrate Moisture Content Levels:
  .1 Unless pre-approved in writing by Consultant and product manufacturer, perform no painting when:
    .1 Ambient air and substrate temperatures are below 10 ° C.
    .2 Substrate temperature is above 32 ° C unless paint is specifically formulated for application at high temperatures.
    .3 Substrate and ambient air temperatures are not expected to fall within MPI or paint manufacturer's prescribed limits.
    .4 The relative humidity is under 85% or when the dew point is more than 3 ° C variance between the air/surface temperature. Paint should not be applied if the dew point is less than 3 ° C below the ambient or surface temperature. Use sling psychrometer to establish the relative humidity before beginning paint work.
  .2 Ensure that conditions are within specified limits during drying or curing process, until newly applied coating can itself withstand 'normal' adverse environmental factors.
  .3 Perform painting work when maximum moisture content of the substrate is below:
    .1 Allow new concrete to cure minimum of 28 days.
    .2 15% for wood.
    .3 12% for plaster and gypsum board.
  .4 Test for moisture using calibrated electronic Moisture Meter. Test concrete floors for moisture using "cover patch test".
  .5 Test concrete and plaster surfaces for alkalinity as required.

.3 Surface and Environmental Conditions:
  .1 Apply paint finish in areas where dust is no longer being generated by related construction operations or when wind or ventilation conditions are such that airborne particles will not affect quality of finished surface.
  .2 Apply paint to adequately prepared surfaces and to surfaces within moisture limits.
  .3 Apply paint when previous coat of paint is dry or adequately cured.

PART 2 PRODUCTS

2.1 Materials

.1 Provide paint materials for paint systems from single manufacturer.

.2 Products to meet requirements of GS-11 or SCAQMD Rule 1113-96

.3 Paint materials listed in the MPI Approved Products List (APL) are acceptable for use on this project.

.4 Only qualified products with E2 or E3 "Environmentally Friendly" rating are acceptable for use.

.5 Linseed oil, shellac, and turpentine: highest quality product from approved manufacturer listed in MPI Architectural Painting Specification Manual, compatible with other coating materials as required.

.6 Paints, coatings, adhesives, solvents, cleaners, lubricants, and other fluids:
.1 Non-flammable, biodegradable.
.2 Manufactured without compounds which contribute to ozone depletion in the upper atmosphere.
.3 Manufactured without compounds which contribute to smog in the lower atmosphere.
.4 Do not contain methylene chloride, chlorinated hydrocarbons or toxic metal pigments.
.5 Recycled content of 15% post-consumer and ½ post-industrial waste.

.7 Formulate and manufacture water-borne surface coatings with no aromatic solvents, formaldehyde, halogenated solvents, mercury, lead, cadmium, hexavalent chromium or their compounds.

.8 Flash point: 61 °C or greater for water-borne surface coatings and recycled water-borne surface coatings.

2.2 Colours

.1 Consultant will provide Colour Schedule.

.2 Colour schedule will be based upon selection of eight base colours and six deep tint accent colours.

.3 Selection of colours will be from manufacturer’s full range of colours.

.4 Where specific products are available in restricted range of colours, selection will be based on limited range.

.5 Second coat in three coat system to be tinted slightly lighter colour than top coat to show visible difference between coats.

2.3 Mixing and Tinting

.1 Perform colour tinting operations prior to delivery of paint to site.

.2 Use and add thinner in accordance with paint manufacturer's recommendations. Do not use kerosene or similar organic solvents to thin water-based paints.

.3 Thin paint for spraying in accordance with paint manufacturer's instructions.

.4 Re-mix paint in containers prior to and during application to ensure break-up of lumps, complete dispersion of settled pigment, and colour and gloss uniformity.

2.4 Gloss/Sheen Ratings

.1 Paint gloss: defined as sheen rating of applied paint, in accordance with following values:

Gloss Level Category/	Units @ 60 Degrees	Units @ 85 Degrees
G1 – matte finish	0 to 5	Max. 10
G2 – velvet finish	0 to 10	10 to 35
G3 – eggshell finish	10 to 25	10 to 35

G4 – satin finish	20 to 35	Min. 35
G5 – semi-gloss finish	35 to 70	
G6 – gloss finish	70 to 85	
G7 – high gloss finish	> 85	

.2 Gloss level ratings of painted surfaces as specified and as noted on Finish Schedule.

2.5 Interior Painting Systems

.1 Concrete Horizontal Surfaces:
  .1 Concrete Floor Sealer: Refer to Section 09 67 00-Fluid Applied Flooring.

.2 Structural Steel:
  .1 INT 5.1X Latex G5 semi-gloss finish (over quick dry shop primer).

.3 Metal Fabrications:
  .1 INT 5.3A Latex G5 semi-gloss finish

.4 Galvanized Metal: interior doors, frames, railings, misc. steel, pipes, and ducts.
  .1 INT 5.3A Latex G5 semi-gloss finish

.5 Concrete masonry units:
  .1 INT 4.2D High performance architectural latex G5 semi-gloss finish.

.6 Wood Clear Polyurethane Finish:
  .1 INT 6.3K Polyurethane varnish G6 gloss finish.

.7 Gypsum Board: Walls and Bulkheads.
  .1 INT 9.2A Latex G3 eggshell finish over latex sealer.

.8 Gypsum Board: Ceilings and Bulkheads:
  .1 INT 9.2A Latex G2 velvet finish over latex sealer.

.9 Ceramic Tile:
  .1 Clean and prepare tile in accordance with manufacturer's written instructions.
  .2 1st coat: Benjamin Moore Fresh Start Multi-Purpose Latex Primer or Sherwin Williams Extreme Bond Bonding Primer MPI 17
  .3 2nd Coat: Benjamin Moore Fresh Start Multi-Purpose Latex Primer or Sherwin Williams Extreme Bond Bonding Primer MPI 17
  .4 3rd Coat: Benjamin Moore Premium Plus Ultra Acrylic Latex or Sherwin Williams Emerald Interior Acrylic Latex (Matte) MPI 53
  .5 4th Coat: Benjamin Moore Premium Plus Ultra Acrylic Latex or Sherwin Williams Emerald Interior Acrylic Latex (Matte) MPI 53

.10 All other surfaces not noted above: high performance finish suitable for commercial and institutional environment and in accordance with MPI painting manual.

PART 3 EXECUTION

3.1 General

.1 Perform preparation and operations for interior painting in accordance with MPI Architectural Painting Specifications Manual except where specified otherwise.

.2 Compliance: comply with manufacturer's written recommendations or specifications, including product technical bulletins, handling, storage and application instructions, and data sheets.

3.2 Examination

.1 Investigate existing substrates for problems related to proper and complete preparation of surfaces to be painted. Report damages, defects, unsatisfactory or unfavourable conditions to Consultant before proceeding with work.

3.3 Preparation

.1 Protection:
  .1 Protect existing building surfaces and adjacent structures from paint spatters, markings and other damage by suitable non-staining covers or masking and in accordance with paint manufacturers and MPI recommendations. If damaged, clean and restore surfaces as directed by Consultant.
  .2 Protect items that are permanently attached such as Fire Labels on doors and frames.
  .3 Protect factory finished products and equipment.

.2 Surface Preparation:
  .1 Remove electrical cover plates, light fixtures, surface hardware on doors, bath accessories and other surface mounted equipment, fittings and fastenings prior to undertaking painting operations. Identify and store items in secure location and re-install after painting is completed.
  .2 Move and cover furniture and portable equipment as necessary to carry out painting operations. Replace as painting operations progress.
  .3 Place "WET PAINT" signs in occupied areas as painting operations progress.

.3 Clean and prepare surfaces in accordance with MPI Architectural Painting Specification Manual requirements. Refer to MPI Manual in regard to specific requirements and as follows:
  .1 Remove dust, dirt, and other surface debris by vacuuming, wiping with dry, clean cloths, or compressed air.
  .2 Wash surfaces with a biodegradable detergent and bleach where applicable and clean warm water using a stiff bristle brush to remove dirt, oil and other surface contaminants.
  .3 Rinse scrubbed surfaces with clean water until foreign matter is flushed from surface.
  .4 Allow surfaces to drain completely and allow to dry thoroughly.
  .5 Prepare surfaces for water-based painting, water-based cleaners should be used in place of organic solvents.
  .6 Use trigger operated spray nozzles for water hoses.
  .7 Many water-based paints cannot be removed with water once dried. Minimize use of mineral spirits or organic solvents to clean up water-based paints.

.4 Prevent contamination of cleaned surfaces by salts, acids, alkalis, other corrosive chemicals, grease, oil and solvents before prime coat is applied and between applications of remaining coats. Apply primer, paint, or pretreatment as soon as possible after cleaning and before deterioration occurs.

.5 Where possible, prime non-exposed surfaces of new wood surfaces before installation. Use same primers as specified for exposed surfaces.
  .1 Apply vinyl sealer to MPI #36 over knots, pitch, sap and resinous areas.
  .2 Apply wood filler to nail holes and cracks.
  .3 Tint filler to match stains for stained woodwork.

.6 Clean metal surfaces to be painted by removing rust, loose mill scale, welding slag, dirt, oil, grease and other foreign substances in accordance with MPI requirements and SSPC-SP 6. Remove traces of blast products from surfaces, pockets and corners to be painted by brushing with clean brushes blowing with clean dry compressed air or vacuum cleaning.

.7 Touch up of shop primers with primer as specified.

.8 Do not apply paint until prepared surfaces have been accepted by Consultant.

3.4 Application

.1 Apply paint materials in accordance with paint manufacturer's written application instructions.

.2 Brush and Roller Application:
- .1 Apply paint in uniform layer using brush and/or roller type suitable for application.
- .2 Work paint into cracks, crevices and corners.
- .3 Paint surfaces and corners not accessible to brush using spray, daubers and/or sheepskins. Paint surfaces and corners not accessible to roller using brush, daubers or sheepskins.
- .4 Brush and/or roll out runs and sags, and over-lap marks. Rolled surfaces free of roller tracking and heavy stipple.
- .5 Remove runs, sags and brush marks from finished work and repaint.

.3 Spray application:
- .1 Provide and maintain equipment that is suitable for intended purpose, capable of atomizing paint to be applied, and equipped with suitable pressure regulators and gauges.
- .2 Keep paint ingredients properly mixed in containers during paint application either by continuous mechanical agitation or by intermittent agitation as frequently as necessary.
- .3 Apply paint in uniform layer, with overlapping at edges of spray pattern. Back roll first coat application.
- .4 Brush out immediately all runs and sags.
- .5 Use brushes and rollers to work paint into cracks, crevices and places which are not adequately painted by spray.

.4 Apply coats of paint continuous film of uniform thickness. Repaint thin spots or bare areas before next coat of paint is applied.

.5 Allow surfaces to dry and properly cure after cleaning and between subsequent coats for minimum time period as recommended by manufacturer.

.6 Sand and dust between coats to remove visible defects.

.7 Finish surfaces both above and below sight lines as specified for surrounding surfaces.

.8 Finish alcoves as specified for adjoining rooms.

.9 Finish top, bottom, edges and cutouts of doors after fitting as specified for door surfaces.

3.5 Mechanical/Electrical Equipment

.1 Paint finished area exposed conduits, piping, hangers, ductwork and other mechanical and electrical equipment with colour and finish to match adjacent surfaces.

.2 Mechanical and electrical rooms: paint exposed conduits, piping, hangers, ductwork and other mechanical and electrical equipment.

.3 Other unfinished areas: leave exposed conduits, piping, hangers, ductwork and other mechanical and electrical equipment in original finish and touch up scratches and marks.

.4 Touch up scratches and marks on factory painted finishes and equipment with paint as supplied by manufacturer of equipment.

.5 Do not paint over nameplates.

.6 Keep sprinkler heads free of paint.

.7 Paint inside of ductwork where visible behind grilles, registers and diffusers with primer and one coat of matt black paint.

.8 Paint fire protection piping red.

.9 Paint natural gas piping yellow.

.10 Paint both sides and edges of backboards for telephone and electrical equipment before installation. Leave equipment in original finish except for touch-up as required, and paint conduits, mounting accessories and other unfinished items.

.11 Do not paint interior transformers and substation equipment.

3.6 Field Quality Control

.1 Provide manufacturer's field services consisting of product use recommendations and periodic site visits for inspection of product installation in accordance with manufacturer's instructions.

.2 Standard of Acceptance:
- .1 Walls: no defects visible from a distance of 1000 mm at 90 degrees to surface.
- .2 Ceilings: no defects visible from floor at 45 degrees to surface when viewed using final lighting source.
- .3 Final coat to exhibit uniformity of colour and uniformity of sheen across full surface area.

3.7 Cleaning and Restoration

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

.2 Clean and re-install hardware items removed before undertaken painting operations.

.3 Remove protective coverings and warning signs as soon as practical after operations cease.

.4 Remove paint splashings on exposed surfaces that were not painted. Remove smears and spatter immediately as operations progress, using compatible solvent.

.5 Protect freshly completed surfaces from paint droppings and dust to approval of Consultant. Avoid scuffing newly applied paint.

.6 Restore areas used for storage, cleaning, mixing and handling of paint to clean condition as approved by Consultant.

End of Section

PART 1 GENERAL

1.1 General

.1 Conform to the requirements of Division 1.

1.2 Related Sections

.1 Section 05 50 00 Metal Fabrications
.2 Section 10 28 10 Toilet and Bath Accessories.

1.3 References

.1 ASTM International (ASTM)
  .1 ASTM A480/A480M-18 Standard Specification for General Requirements for Flat-Rolled Stainless and Heat-Resisting Steel Plate, Sheet, and Strip
  .2 ASTM E84-18b Standard Test Method for Surface Burning Characteristics of Building Materials
.2 CSA Group (CSA)
  .1 CSA-B651-12 Accessible Design for the Built Environment.
.3 American National Standards Association (ANSI)
  .1 ANSI/NEMA LD 3-2005 High-Pressure Decorative Laminates (HPDL)
.4 Accessibility for Ontarians with Disabilities Act (AODA)

1.4 Submittals

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

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

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

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

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

.6 Closeout Submittals:
  .1 Provide maintenance data for plastic toilet compartments for incorporation into manual specified in Section 01 78 00 - Closeout Submittals.

1.5 Shipping, Handling and Storage

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

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

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

1.6 Waste Management and Disposal

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

1.7 Warranty

.1 Warrant the work of this Section against defects of workmanship and material, for a period of three years from the date of Substantial Performance and agree to make good promptly any defects which occur or become apparent within the warranty period.

PART 2 PRODUCTS

2.1 Approved Manufacturers

.1 Compartments and cubicles as manufactured by the following may be used subject to approval of product specifications and details by the Consultant:
  .1 Buddsteel Architectural Products. Teeswater Ontario
  .2 Edwards Door Systems Ltd. Sarnia, Ontario
  .3 ASI Global Partitions
  .4 Bradley Corporation

2.2 Design

.1 Powder coated metal, floor mounted overhead braced toilet partitions with operational full height vandal resistant hardware.
  .1 Standard of acceptance: ASI Global Partitions, #, Powder Coated Metal.

.2 Urinal Screens: 1067mm high Powder Coated Metal wall hung urinal screens
  .1 Standard of Acceptance: ASI Global Partitions.
    .1 Brackets Continuous: 3 mm, double thickness, both sides.

.3 Supply and install all required toilet partitions, change cubicles and urinal screens complete with all required hardware and accessories.

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

.5 Colours will be selected by the Consultant from the manufacturer's full range of colours. Up to two (2) colours will be selected.

2.3 Materials

.1 Doors and panels shall be 1" thick, constructed of two sheets of 22-gauge, galvanized, stretcher-leveled quality steel formed and bonded under pressure with a non-toxic adhesive to a resin-impregnated, sound-deadening honeycomb core.

.2 Pilasters shall be 1-1/4", constructed of two sheets of 22-gauge, galvanized steel, formed and bonded under pressure with a non-toxic adhesive to a full resin-impregnated, sound-deadening full-face honeycomb core.

2.4 Construction

.1 Doors and panels shall be 1" thick. The perimeter shall be sealed with a 22-gauge steel interlocking molding. Molding corners shall be welded to each other and to face sheets and ground smooth to form a rigid frame around the component.

.2 Pilasters shall be 1 -1/4" thick. The perimeter shall be sealed with a 22-gauge steel interlocking molding. An inverted stirrup with a jack bolt for leveling during installation and permanent height adjustment shall be welded within the base of each Pilaster. "L" brackets shall be coupled to the stirrup bracket and floor for full range adjustment. A shoe shall conceal each mounting, having an internal cross section conforming to the pilaster, and being formed of type 304 stainless steel #4 finish.

.3 Headrail shall be provided to bridge all compartments and brace the end freestanding pilasters to the wall; the headrail shall be anodized aluminum satin finish, contoured to provide anti-grip feature.

.4 All units shall be cleaned prior to application of baked hybrid powder coating of at least 1.3 mil thickness.

2.5 Hardware

.1 All exposed door hardware shall be as noted:
- .1 Chromium plated die cast zamac hinge shall have gravity acting cam and wrap around flanges. Upper and lower door hinges are recessed. Door hardware shall include a coat hook, bumper, stop, keeper, a concealed latch with emergency access and chromium plated vandal resistant fasteners.
- .2 Optional: Stainless steel die cast hinge shall have gravity acting cam and wrap around flanges. Upper and lower door hinges are recessed. Door hardware shall include a coat hook, bumper, stop, keeper, a concealed latch with emergency access and stainless steel vandal resistant fasteners.
- .3 Optional: Continuous stainless steel hinge. Door hardware shall include a coat hook, bumper, stop, keeper, a concealed latch with emergency access and stainless steel vandal resistant fasteners.

.2 Panel and pilaster brackets shall be as noted:
- .1 Stirrup brackets shall be 2 1/8" long chromium plated die cast zamac. Stirrup brackets shall be 1/8" thick and mounted with chrome plated steel vandal resistant fasteners. The attachment of brackets to the adjacent wall construction shall be accomplished with 2 ½" chrome plated steel vandal resistant screws and plastic anchors.
- .2 Optional: Stirrup brackets shall be 2 1/8" long die cast stainless steel. Stirrup brackets shall be 1/8" thick and mounted with stainless steel vandal resistant fasteners. The attachment of brackets to the adjacent wall construction shall be accomplished with 2 ½" chromium plated steel vandal resistant screws and plastic anchors.
- .3 Optional: Continuous heavy duty anodized extruded aluminum (6063-T5 alloy) wall brackets are predrilled. Wall brackets are mounted with chromium plated steel vandal resistant fasteners. The attachment of brackets to the adjacent wall construction shall be accomplished with 2 ½" chromium plated steel vandal resistant screws and plastic anchors.

.4 Optional: Continuous heavy duty stainless steel wall brackets are predrilled. Wall brackets are mounted with stainless steel vandal resistant fasteners. The attachment of brackets to the adjacent wall construction shall be accomplished with 2 ½" stainless steel vandal resistant screws and plastic anchors.

.3 Pilaster shoes shall be stainless steel 3" high with a #4 satin finish.

.4 Headrail shall be made of heavy-duty anodized extruded aluminum (6063-T5 alloy). Headrail is anti-grip and attaches to the top of the pilaster with stainless steel vandal resistant screws.

.5 Headrail brackets shall be made from a die cast aluminum alloy and shall be attached to the adjacent wall construction with 2½" stainless steel vandal resistant screws and plastic anchors.

PART 3 EXECUTION

3.1 Manufacturer's Instructions

.1 Compliance: comply with manufacturer's written recommendations or specifications, including product technical bulletins, handling, storage and installation instructions, and datasheets.

3.2 Inspection

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

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

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

3.3 Installation

.1 Ensure supplementary anchorage is in place.

.2 Do work in accordance with CSA-B651.

.3 Install products in strict compliance with manufacturer's written instructions and recommendations, including the following:
.1 Verify blocking and supports in walls and ceilings have been installed properly at points of attachment.
.2 .Verify location does not interfere with door swings or use of fixtures.
.3 Use fasteners and anchors suitable for substrate and project conditions
.4 Install units rigid, straight, plumb, and level.
.5 Conceal evidence of drilling, cutting, and fitting to room finish.
.6 Test for proper operation.

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

3.4 Cleaning

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

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

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

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

End of Section

PART 1 GENERAL

1.1 General

.1 Conform to the requirements of Division 1.

1.2 Related Sections

.1 Section 04 22 00 Concrete Masonry Units
.2 Section 08 80 05 Glazing
.3 Section 09 21 16 Gypsum Board
.4 Section 10 21 13 Compartments and Cubicles
.5 Section 10 51 13 Lockers

1.3 References

.1 ASTM International (ASTM)
  .1 ASTM A653/A653M-18 Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process
  .2 ASTM A924/A924M-18 Standard Specification for General Requirements for Steel Sheet, Metallic-Coated by the Hot-Dip Process
  .3 ASTM B456-17 Standard Specification for Electrodeposited Coatings of Copper Plus Nickel Plus Chromium and Nickel Plus Chromium
.2 Canadian General Standards Board (CGSB)
  .1 CAN/CGSB-1.81-M90, Air Drying and Baking Alkyd Primer for Vehicles and Equipment.
  .2 CAN/CGSB-1.88-92, Gloss Alkyd Enamel, Air Drying and Baking.
  .3 CGSB 31-GP-107Ma-90, Non-inhibited Phosphoric Acid Base Metal Conditioner and Rust Remover.
.3 CSA Group (CSA)
  .1 CSA-B651-12 (R2017) Accessible Design for the Built Environment.
  .2 CSA G164-18 Hot Dip Galvanizing of Irregularly Shaped Articles.

1.4 Submittals

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

.2 Shop Drawings:
  .1 Indicate size and description of components, base material, surface finish inside and out, hardware and locks, attachment devices, description of rough-in-frame, building-in details of anchors for grab bars.

.3 Samples:
  .1 Submit samples when requested.
  .2 Samples to be returned for inclusion into work.

.4 Closeout Submittals:
  .1 Provide maintenance data for toilet and bath accessories for incorporation into manual specified in Section 01 78 00 - Closeout Submittals.

1.5 Shipping, Handling and Storage

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

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

1.6 Waste Management and Disposal

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

1.7 Extra Materials

.1 Provide special tools required for accessing, assembly/disassembly or removal for toilet and bath accessories in accordance with requirements specified in Section 01 78 00 - Closeout Submittals.

.2 Deliver special tools to Owner.

PART 2 PRODUCTS

2.1 Materials

.1 Sheet steel: to ASTM A653 with ZF001 designation zinc coating.

.2 Stainless steel sheet metal: Type 304, with Brushed finish.

.3 Stainless steel tubing: Type 304, commercial grade, seamless welded, minimum 1.2 mm wall thickness.

.4 Fasteners: concealed screws and bolts hot dip galvanized, exposed fasteners to match face of unit. Expansion shields fibre, lead or rubber as recommended by accessory manufacturer for component and its intended use.

2.2 Manufacturers

.1 Products and components listed are minimum standard of acceptance. Alternative products by recognized manufacturers of toilet and bath accessories may be accepted subject to review by the Consultant of manufacturer’s product information and specifications.

.2 Acceptable manufacturers include:
.1 Bobrick
.2 Bradley
.3 Frost
.4 Hafele
.5 Richelieu
.6 Watrous

2.3 Components

.1 Surface Mounted Hand Dryers: World Dryer Airmax Model XM5-974, Automatic hand dryer, 115V, 20 Amp, 2300 Watt, cast iron cover, surface mounted, white

.2 GB1: Grab Bar, 38 mm diameter x 1.6 mm wall tubing of stainless steel, 76 mm diameter wall flanges, concealed screw attachment, flanges welded to tubular bar, provided with steel back plates and all accessories. Knurl bar at area of hand grips. Grab bar material and anchorage to withstand downward pull of 2.2 kN. 600 mm long.
.1 Bobrick B-6806.99 x 24

.3 GB2: Barrier Free Toilet Grab Bars 2 (L-shaped) 760 x 760 38 mm dia. Peened finish c/w mounting kits.
.1 Bobrick B-6898.99, 90° Angle Grab Bar.

.4 Framed Mirror: Bobrick B-165 1830.

.5 Stainless Steel Shelf: To CSA B651. 455 mm long x 125mm wide, 1.2mm type 304 stainless steel, satin finish. 19mm return edge; front edge hemmed for safety. 1.6mm brackets.
.1 Bobrick B295 x 18

.6 Coat Hook: Bright polished stainless steel hook with 50 x 50 mm flange, hook 25 mm wide x 165 mm high. Concealed wall plate.
.1 Bobrick B-682

2.4 Fabrication

.1 Weld and grind joints of fabricated components flush and smooth. Use mechanical fasteners only where approved.

.2 Wherever possible form exposed surfaces from one sheet of stock, free of joints.

.3 Brake form sheet metal work with 1.5 mm radius bends.

.4 Form surfaces flat without distortion. Maintain flat surfaces without scratches or dents.

.5 Back paint components where contact is made with building finishes, to prevent electrolysis.

.6 Hot dip galvanize concealed ferrous metal anchors and fastening devices to CSA G164.

.7 Shop assemble components and package complete with anchors and fittings.

.8 Deliver inserts and rough-in frames to job site at appropriate time for building-in. Provide templates, details and instructions for building in anchors and inserts.

.9 Provide steel anchor plates and components for installation on studding and building framing.

2.5 Finishes

.1 Chrome and nickel plating: to ASTM B456, satin finish.

.2 Baked enamel: condition metal by applying one coat of metal conditioner to CGSB 31-GP-107Ma, apply one coat Type 2 primer to CAN/CGSB-1.81 and bake, apply two coats Type 2 enamel to CAN/CGSB-1.88 and bake to hard, durable finish. Sand between final coats. Colour selected from standard range by Consultant.

.3 Manufacturer's or brand names on face of units not acceptable.

PART 3 EXECUTION

3.1 Installation

.1 Install toilet and bath accessories in accordance with the Ontario Building Code, CSA B651 and manufacturer’s instructions.

.2 Install and secure accessories rigidly in place as follows:
.1 Stud walls: install steel back-plate to stud prior to plaster or drywall finish. Provide plate with threaded studs or plugs.
.2 Hollow masonry units or existing plaster/drywall: use toggle bolts drilled into cell/wall cavity.
.3 Solid masonry or concrete: use bolt with lead expansion sleeve set into drilled hole.

.3 Install grab bars on built-in anchors provided by manufacturer.

.4 Use tamper proof screws/bolts for fasteners.

.5 Fill units with necessary supplies shortly before final acceptance of building.

.6 Install products in strict compliance with manufacturer's written instructions and recommendations, including the following:
- .1 Verify blocking has been installed properly.
- .2 Verify location does not interfere with door swings or use of fixtures.
- .3 Comply with manufacturer's recommendations for backing and proper support.
- .4 Use fasteners and anchors suitable for substrate and project conditions.
- .5 Install units rigid, straight, plumb, and level, in accordance with manufacturer's installation instructions and approved shop drawings.
- .6 Conceal evidence of drilling, cutting, and fitting to room finish.
- .7 Test for proper operation.

.7 Install electric hand dryers according to manufacturer's instructions. Installation shall be by an electrician and shall be completed in accordance with all relevant standards and Codes.

3.2 Schedule

.1 Locate accessories where indicated. Exact locations determined by Owner.

3.3 Cleaning

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

.2 Clean exposed surfaces of compartments, hardware, and fittings using methods acceptable to the manufacturer.

.3 Touch-up, repair or replace damaged products until Substantial Performance.

End of Section

PART 1 GENERAL

1.1 General

.1 Conform to the requirements of Division 1.

1.2 Related Sections

.1 Section 06 10 00 Rough Carpentry
.2 Section 06 20 00 Finish Carpentry

1.3 References

.1 ASTM International (ASTM)
  .1 ASTM A1008/A1008M-20 Standard Specification for Steel, Sheet, Cold-Rolled, Carbon, Structural, High-Strength Low-Alloy, High-Strength Low-Alloy with Improved Formability, Solution Hardened, and Bake Hardenable

1.4 Submittals

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

.2 Submit detailed shop drawings of metal lockers.
  .1 Provide layout plans and elevations of banks of lockers.
  .2 Clearly indicate type and class of locker, materials, thickness of metals, fabricating and assembly methods, assembled banks of lockers, trim, shelves, tops, end panels, filler panels, bases, doors, hardware, numbering, locking assemblies, ventilation method, installation methods and finishes.

.3 Submit samples of locker components, finishes and fastening devices.

.4 Submit triplicate colour charts showing full range of manufacturer's standard colours for selection by the Consultant.

.5 Maintenance Data: Submit manufacturer's written instructions for cleaning and operation of lockers for inclusion in Operation and Maintenance manuals specified in Section 01 78 00 – Closeout Submittals.

1.5 Shipping, Handling and Storage

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

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

.3 Deliver lockers only after closing-in of building.

.4 Handle products to prevent bending, racking or otherwise damaging lockers. Protect refinished surfaces from marring. Damaged products shall not be installed and shall be removed from project site.

1.6 Waste Management and Disposal

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

1.7 Warranty

.1 Warrant the work of this Section against defects of workmanship and material, for a period of two years from the date of Substantial Performance and agree to make good promptly any defects which occur or become apparent within the warranty period.

PART 2 PRODUCTS

2.1 General

.1 Lockers:
- .1 Single full-height and double tier lockers as indicated, 305 mm and 406 mm wide.
- .2 All lockers shall be mounted on existing 150 mm high concrete curbs as detailed.- review site conditions.
- .3 All welded construction.
- .4 Lockers shall be all powder coat painted steel.
- .5 Full height piano hinges.

2.2 Painted Steel Lockers

.1 Cold-Rolled Steel Sheet: ASTM A1008, Commercial Steel (CS) Type B, suitable for exposed applications.

.2 Locker Bodies: Locker sides, backs, tops, bottoms, bases, end closers, and shelves shall be fabricated from pre-painted cold rolled, electro-zinc coated sheet steel. Edges to be suitable formed to provide a rigid assembly when bolted or riveted together. Tops, bottoms and shelves shall be flanged on all sides. Sides shall be double ribbed their entire length to ensure a stiff, rigid installation. Tops to be sloped.

.3 Frames to be 1.60 mm specially formed channel sections of prime cold rolled steel with 16 mm wide full closure strike, full height of door. Doors to close flush with outside face of frame.

.4 Top, Bottom, Backs and Shelves: 0.81 mm pre-painted steel.

.5 Sides: 0.60 mm painted steel.

.6 The locker bottom shall have a 1.60 mm support bracket installed across the center of the locker bottom.

.7 Tiers:
- .1 Single Tier 305 x 1839 x 455 mm deep.
- .2 Double Tier 305 x 915 x 455 mm deep.

2.3 Doors

.1 Doors shall be double skin, minimum 21 mm thick with 1.60 mm outer panel and 0.60 mm inner panel welded together to form a rigid box.

.2 Honeycomb filler for locker doors shall contain minimum 18% recycled content.

2.4 Accessories

.1 Locker numbers: Engraved plastic or aluminum number plates with black numerals. Locker numbering to Owner's requirements.

.2 Provide manufacturer's standard sloping top, fillers and trim required to complete the installation.

.3 Ventilation shall be by louvres in the top and bottom frame members.

.4 Fillers: Provide sheet metal trim finished to match lockers for closure and transition of lockers to adjacent surfaces as detailed on drawings and approved shop drawings.

.5 End panels: Provide exposed ends of locker modules with sheet metal end panels finished to match lockers.

.6 Interior Equipment: Each locker to be provided complete with a shelf located approximately 350 mm below the top of the locker and 3 round tip, zinc plated metal coat hooks attached with 2 bolts per hook.

.7 Provide lockers complete with all hardware necessary for a complete installation. Hardware for each locker includes, but is not limited to, one recessed chrome plated steel or aluminum pocket for padlock locking, flush face, rubber bumpers on strike jamb of frame, and concealed nylon friction action door stop.

.8 Hinges: 1.60 mm continuous integral one piece steel hinge, painted to match lockers.

.9 Fastenings shall be concealed where possible. Exposed fastenings shall be neatly executed and shall be of the same material and finish as the base metal on which they occur.

.10 Mounting hardware: Provide brackets, perforated ventilation strips, fasteners, and other hardware of type and size recommended by manufacturer for type of substrate.

2.5 Finishes

.1 Finish: all cold rolled surfaces shall be thoroughly cleaned before painting with a phosphoric acid based cleaner. The parts shall be finished with an abrasion and graffiti resistant electrostatically applied polymer powder coating baked with the proper temperature/time relationship to ensure a tough, durable finish.

.2 Colours: Locker sides, backs, tops, bottoms and shelves shall be manufacturer's standard colour. Doors, frames, bases, end closers and sloping tops to be of colours as selected by the Consultant from the manufacturers full range of standard colours. Up to three (3) colours may be selected.

PART 3 EXECUTION

3.1 Fabrication

.1 Verify all dimensions on the site prior to proceeding with shop fabrication.

.2 Fabricate the work true to dimensions, square, plumb, and level. Accurately fit members with hairline joints.

.3 Secure intersecting members with appropriate fasteners.

.4 Fabricate the finished work free from distortion and defects detrimental to appearances and performance.

.5 Lockers shall be completely factory assembled by riveting frames and doors to body.

.6 Frame: Welded overlapping construction with double material thickness for lock housing.

.7 Body: Flanged, reinforced and back ventilated.

.8 Base: none required.

3.2 Installation

.1 Prior to installation, check and verify work of other sections on which lockers are to be mounted. Report any discrepancies to the Consultant.

.2 Wood furring for lockers shall be installed as specified in Section 06 10 00.

.3 Assemble and install lockers in accordance with manufacturer's written instructions.

.4 Securely fasten lockers to grounds and nailing strips.

.5 Install filler panels (false fronts) where indicated and where obstructions occur.

.6 Arrange locker modules in sequence of locker numbers.

.7 Install locker numbers.

.8 Provide all metal trim and closures necessary for a complete, finished installation.

.9 Securely anchor lockers in place, true and plumb. Method of fastening shall ensure that lockers are capable of withstanding expected loads without movement.

.10 Install lockers secure, plumb, square, and in line.

.11 Position lockers with 25 mm air flow space between module and wall and 51 mm space between back-to-back lockers. Install perforated filler strip at top of air spaces.

.12 Anchor lockers at spacing indicated on approved shop drawings with appropriate anchor devices to suit adjacent materials and finishes:
- .1 For each locker module, install minimum of 1 locker-to-wall bracket.
- .2 Bolt adjoining locker modules together to provide rigid installation with stainless steel bolts of type, size, and spacing as recommended by manufacturer.

.13 Install filler panels, end panels, filler, sloping tops and trim to completely close off openings.

3.3 Adjustment

.1 Test mechanisms, hinges, locks and latches and where necessary, adjust and lubricate and ensure that accessories are in perfect working order.

3.4 Cleaning

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

.2 Upon completion of the work remove all traces of protective coatings or paper.

.3 Wash exposed surface using a solution of mild detergent in warm water, applied with soft, clean cloths. Do not use abrasives.

End of Section

PART 1 GENERAL

1.1 General

.1 Conform to the requirements of Division 1.

1.2 Related Sections

.1 Section 03 30 00 Cast-In-Place Concrete
.2 Section 04 22 00 Concrete Unit Masonry
.3 Section 09 65 19 Resilient tile Flooring
.4 Section 08 71 10 Door Hardware
.5 Section 09 91 23 Interior Painting

1.3 References

.1 American Society of Mechanical Engineers (ASME)
  .1 ASME A17.1-2016/CSA B44-2016 Safety Code for Elevators and Escalators
  .2 ASME A17.5-2019/CSA B44.1:19 Elevator and Escalator Electrical Equipment.
  .3 ASME A18.1-2017 Safety Standard for Platform Lifts and Stairway Chairlifts.
.2 American National Standards Institute (ANSI)
  .1 ANSI B29.2-2007 (R2017) Inverted Tooth (Silent) Chains and Sprockets.
.3 CSA Group (CSA)
  .1 CSA B355:19 Platform Lifts and Stair Lifts for Barrier-Free Access
  .2 CSA C22.1-18 Canadian Electrical Code, Part I, Safety Standard for Electrical Installations
.4 International Code Council (ICC)
  .1 ICC A117.1-2017 Accessible and Usable Buildings and Facilities.
.5 Accessibility for Ontarians with Disabilities Act (AODA)
.6 Technical Standards & Safety Authority (TSSA)

1.4 Submittals

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

.2 Product Data: Manufacturer's data sheets on each product to be used, including:
  .1 Manufacturer’s installation instructions, including preparation, storage and handling requirements.
  .2 Include complete description of performance and operating characteristics.
  .3 Show maximum and average power demands.

.3 Shop Drawings:
  .1 Show typical details of assembly, erection and anchorage.
  .2 Include wiring diagrams for power, control, and signal systems.
  .3 Show complete layout and location of equipment, including required clearances and coordination with shaftway.

.4 Provide maintenance data for incorporation into Operation and Maintenance Manual specified in Section 01 78 00 – Closeout Submittals.
  .1 Include in maintenance data:
    .1 Replacement parts list
    .2 Legible schematic wiring diagrams covering electrical equipment as supplied and installed, including changes made in final work, with symbols listed corresponding to components or markings.

.3 Manufacturer's recommended maintenance tasks and frequencies.

.5 Selection Samples: For each finished product specified, provide two complete sets of colour chips representing manufacturer's full range of available colours and patterns.

.6 Verification Samples: For each finished product specified, two samples, minimum size 50 x 50 mm, representing actual product, colour, and patterns.

1.5 Quality Control

.1 Use major lift components from standard product line of one manufacturer.

.2 Use components only that have performed together satisfactorily, under conditions of normal use in not less than ten other public Canadian lift installations, and for a period of not less than one year.

.3 Major components shall be construed to mean drive means, machine tower, platform and enclosure assembly, and operating and control fixtures.

1.6 Quality Assurance

.1 Manufacturer Qualifications: Firm with minimum 10 years of experience in manufacturing of vertical platform lifts, with evidence of experience with similar installations of type specified.

.2 Installer Qualifications: Licensed to install equipment of this scope, with evidence of experience with specified equipment. Installer shall maintain an adequate stock of replacement parts, have qualified people available to ensure fulfillment of maintenance and callback service without unreasonable loss of time in reaching project site.

1.7 Requirements of Regulatory Agencies

.1 Fabricate and install work in compliance with applicable jurisdictional authorities.

.2 File shop drawings and submissions with local authorities as the information is made available. Company pre-inspection and jurisdictional authority inspections and permits are to be made on timely basis as required.

1.8 Shipping, Handling and Storage

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

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

.3 Store products in manufacturer's unopened packaging until ready for installation.

.4 Store components off the ground in a dry covered area, protected from adverse weather conditions.

1.9 Project Conditions

.1 Maintain environmental conditions (temperature, humidity, and ventilation) within limits recommended by manufacturer for optimum results. Do not install systems under environmental conditions outside manufacturer's absolute limits.

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

1.10 Waste Management and Disposal

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

1.11 Maintenance Service

.1 Provide complete maintenance and call back service as detailed in manuals specified above, or as required by owner for a period of twelve months following Substantial Performance.

.2 Include for recommended schedule of examinations, cleaning, adjustment and lubrication.

.3 Repair or replace electrical and mechanical parts of lift equipment as required due to defect or normal wear and tear.

.4 Use only genuine standard replacement parts as produced by lift manufacturer.

.5 Perform work by competent personnel, who shall have certification of factory training, under the supervision and in the direct employ of the lift manufacturer.

.6 Scheduled work shall be performed in the regular working hours of regular working days, and work shall be scheduled with the Owner.

.7 Provide proof of successful experience in the complete maintenance of the specified lift type. Maintain locally an adequate stock of parts for replacement for emergency purposes and provide qualified men to ensure fulfilment of serviceability without undue loss of time in reaching the jobsite.

.8 At each inspection, personnel shall register both in and out with designated building personnel. Maintain a log of all tasks performed including explanations of any failures or breakdowns, including corrective actions taken and parts replaced. Make log available to Owner on request and turn log over to Owner on completion of maintenance period.

1.12 Warranty

.1 Warrant the work of this Section against defects of workmanship and material, for a period of two years from the date of Substantial Performance and agree to make good promptly any defects which occur or become apparent within the warranty period.

.2 Extended Warranty: Provide an extended manufacturer's warranty for the entire warranty period covering the wheelchair lift materials and workmanship for the following additional extended period beyond the initial two year warranty. Preventive Maintenance Agreement required.
.1 Five additional years.

PART 2 PRODUCTS

2.1 Manufacturer

.1 Acceptable Manufacturer: Savaria Lift; 2 Walker Drive, Brampton, ON L6T 5E1, TEL: 1-855-728-2742, www.savaria.com.

2.2 Commercial Wheelchair Lift

.1 Hydraulic Vertical Platform Lifts: Savaria V1504-STD – Type 2 or approved alternate.

.2 Hydraulic Vertical Platform Lift: The lift described here, manufactured by Savaria Lifts Inc, is a vertical platform lift consisting of a hydraulic tower with a lifting platform. The platform is made to accommodate a wheelchair user or a person with impaired mobility. The lift can be used indoor or outdoor (with optional package) and in commercial or residential applications.

.3 Work described in this section includes providing equipment, incidental material and labor required for complete, operable roped hydraulic wheelchair lift installation. Lifts shall be erected, installed, adjusted, tested and placed in operation by lift system manufacturer, or manufacturer's authorized installer.
- .1 Lifts shall be in accordance:
  - .1 ASME A18.1 and ADAAG compliant (USA)
  - .2 CSA B355 (Canada)

.4 The following preparatory work to receive the lifts specified in this section is part of the work of other sections:
- .1 Permanent 120 VAC, 20 amp single phase power to operate lift to be provided from a lockable fused/cartridge type disconnect switch with auxiliary contacts for battery operation. Refer to drawings for permanent power specifications and location of disconnects. Temporary power may be provided to expedite installation of lift.
- .2 Provide a plumb and square hoistway with smooth interior surfaces, including fascias or furring of the hoistway interior.
- .3 Provide rough openings per lift contractor's shop drawings.
- .4 Provide substantial, level pit floor slab as indicated on the lift contractor's shop drawings.

.5 Characteristics:
- .1 Rated Load: 340 kg (750 lb).
- .2 Rated Speed: 0.10 m/s (20 fpm).
- .3 Car Dimensions:
  - .1 1067 mm by 1524 mm (42 inches W by 60 inches D)
- .4 Levels Serviced:
  - .1 2.
- .5 Car Configuration:
  - .1 Front/rear exit.
- .6 Travel: 940mm (3’-1”)
- .7 Pit Depth:
  - .1 76mm (3”) – Standard
- .8 Power Coat Finish
  - .1 Almond beige – Standard
- .9 Operation: Constant pressure.
- .10 Power Supply: 110 volt, 20 amp, 1 phase, 60 Hz.
- .11 Drive System: 2:1 Roller chain hydraulic.
- .12 Emergency Power:
  - .1 Battery operation in down direction – Standard.
- .13 Controller: Relay logic based controller.
- .14 Motor/Pump: 3HP (2.24 kw), gear type
- .15 Manual Lowering: Outside the hoistway at lower landing.

.6 Car Enclosure:
.1 Cab Configuration:
.1 Side Guards of platform shall have a steel frame with a powder coat finish and steel panel inserts to a minimum of 42 inches (1067mm) high.

.7 Doors and Gates:
.1 First landing door:
.1 Door type:
.1 2032mm (80”) low profile aluminum door with a concealed electro/mechanical interlock.
.2 Flush closing operation with hoistway side.
.3 Operation
.1 Manual – with hydraulic closer
.4 Door Width
.1 1067 mm (42 inches) clear opening

.8 Upper landing gate:
.1 Gate type:
.1 1067mm (42”) low profile aluminum gate with a concealed electro/mechanical interlock.
.2 Flush closing operation with hoitsway side.
.3 Operation
.1 Manual – with hydraulic closer
.4 Door/Gate Width
.1 1067 mm (42 inches)

.9 Call Stations: Provide flush, surface or door frame mounted landing call/send stations.
.1 Call stations will be:
.2 Keyed (removable in on/off position)

.10 Car Operation:
.1 Car Operating Panel shall consist of constant pressure buttons, emergency stop/alarm button, on/off key switch (when applicable) and emergency LED light mounted on a removable stainless steel panel (Type 304 #4 Stainless Steel Finish).
.2 Auxiliary lighting: The car shall be equipped with a battery operated LED light fixture. The battery shall be the rechargeable type with an automatic recharging system.
.3 Telephone: The car shall be equipped with a
.1 Hand held recessed telephone
.2 ADA Hands free phone.

.11 Pumping Unit and Control:
.1 The pumping unit and control shall be enclosed in the tower. The controller and pump unit shall be pre-wired and tested prior to shipment. The controller is to be relay logic based operation for ease of maintenance and service. Pump unit shall incorporate the following features:
.1 Adjustable pressure relief valve.
.2 Manually operable down valve to lower lift in the event of an emergency. This valve shall be activated from outside of the hoistway through a keyed box.
.3 Pressure gauge isolating valve, manually operable.
.4 Gate valve to isolate cylinder from pump unit.
.5 Electrical solenoid for down direction control.
.6 Emergency Operation - A manual lowering device shall be located outside the hoistway in a lockable box positioned at a lower landing.

.12 Cylinder And Plunger:
.1 The cylinder shall be constructed of steel pipe of sufficient thickness and suitable safety margin. The top of the cylinder shall be equipped with a cylinder head with an internal guide ring and self-adjusting packing.
.2 The plunger shall be constructed of a steel shaft of proper diameter machined true and smooth. The plunger shall be provided with a stop electrically welded to the bottom to prevent the plunger from leaving the cylinder.

.13 Roller Chains: Two No.50 roller chains with 5/8 inch (16 mm) pitch. Minimum breaking strength 6100 lb (2773 kg) each.

.14 Leveling Device:
.1 The lift shall be provided with an anti-creep device which will maintain the carriage level within 1/2 inch (12 mm) of each landing.
.2 All limit switch and leveling device switches shall be located in a position to be inaccessible to unauthorized persons. They shall be located behind the mast wall and be accessible through removable panels.

.15 Guide Yoke: The 2:1 guide yoke/sprocket assembly shall be supplied with idler sheaves, roller guide shoes, bearings and guards.

.16 Terminal Stopping Devices: Normal terminal stopping devices shall be provided at top and bottom of runway to stop the car positively and automatically.

.17 Guide Rails and Brackets: Steel 'C'' guide rails and brackets shall be used to guide the platform and sling. Guide rails shall form part of the structural integrity of the unit and be integral to the mast enclosure, ensuring stability and minimum platform deflection when loaded.

.18 Car Sling: Car sling shall be fabricated from steel tubing 44 inches (1116 mm) high with adequate bracing to support the platform and car enclosure. Roller guide shoes shall be mounted on the top and bottom of the car sling to engage the guide rails. Guide shoes shall be roller type with 3 inches (76 mm) diameter wheels. Nylon guide shoes shall not be used for better ride quality and durability.

.19 Wiring: All wiring and electrical connections shall comply with applicable codes. Insulated wiring shall have flame-retardant and moisture-proof outer covering and shall be run in conduit or electrical wire ways if located outside the unit enclosure. Quick disconnect harnesses shall be used when possible.

PART 3 EXECUTION

3.1 Examination

.1 Do not begin installation until substrates have been properly prepared.

.2 Verify shaft and machine space are of correct size and within tolerances.

.3 Verify required landings and openings are of correct size and within tolerances.

.4 Verify electrical rough-in is at correct location.

.5 If substrate preparation is the responsibility of another installer, notify Consultant of unsatisfactory preparation before proceeding.

3.2 Preparation

.1 Clean surfaces thoroughly prior to installation.

.2 Prepare surfaces using the methods recommended by the manufacturer for achieving the best result for the substrate under the project conditions.

3.3 Installation

.1 Install platform lifts in accordance with applicable regulatory requirements including CSA B355, ASME A 17.1, ASME A 18.1 and the manufacturer's instructions.

.2 Install system components and connect to building utilities.

.3 Accommodate equipment in space indicated.

.4 Startup equipment in accordance with manufacturer’s instructions.

.5 Adjust for smooth operation.

3.4 Field Quality Control

.1 Perform and meet inspection tests as required by jurisdictional authorities

.2 Perform tests in compliance with CSA B355, ASME A17.1 or A18.1 and as required by authorities having jurisdiction.

.3 Provide two weeks written notice of all tests to Consultant.

.4 Schedule tests with agencies to ensure that Owner and Contractor are present.

.5 Provide legible copies of approval certificates as required by jurisdictional authorities.

3.5 Protection

.1 Protect installed products until completion of project.

.2 Touch-up, repair or replace damaged products before Substantial Performance.

3.6 Cleaning

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

End of Section

PART 1 GENERAL

1.1 General

.1 Conform to the requirements of Division 1.

1.2 Related Sections

.1 Section 03 30 00 Cast-In-Place Concrete
.2 Section 32 16 13 Concrete Curbs

1.3 References

.1 ASTM International (ASTM)
  .1 ASTM D698-12e2 Standard Test Methods for Laboratory Compaction Characteristics of Soil Using Standard Effort (12 400 ft-lbf/ft3 (600 kN-m/m3))
  .2 ASTM D1557-12e1 Standard Test Methods for Laboratory Compaction Characteristics of Soil Using Modified Effort (56,000 ft-lbf/ft3 (2,700 kN-m/m3))
.2 Ontario Provincial Standard Specifications (OPSS)
  .1 OPSS 805 Construction Specification for Temporary Erosion and Sediment Control Measures (November 2015)
  .2 OPSS 180 General Specification for the Management of Excess Materials (November 2011)
  .3 OPSS 206 Construction Specification for Grading (November 2009)
  .4 OPSS 1010 Material Specification for Aggregates - Base, Subbase, Select Subgrade, and Backfill Material
.3 Ontario Provincial Standard Details (OPSD)
  .1 OPSD 219.130 Heavy Duty Silt Fence Barrier (November 2006)
  .2 OPSD 805 Temporary Erosion and Sediment Control Measures (November 2015)
.4 The Occupational Health and Safety Act.

1.4 Submittals

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

.2 Submit shop drawings of shoring and bracing required in connection with excavation. Drawings to show clearly procedural sequence to be followed.

1.5 Definitions

.1 Earth: Site excavated material, including shale, rubble rock, building debris, shrub and tree roots and soil.

.2 Soil: Site excavated material, free from shale, rubble rock, building debris, shrub and tree roots.

.3 Fill: Approved materials, other than earth, clay and unapproved soil. Approved soil may be used only with approval of the Consultant in writing.

.4 Rock: All solid rock in ledges, stratified deposits, unstratified masses, and all conglomerate deposits or any other material so firmly cemented by process of nature as to present all the characteristics of solid rock, being so hard or firmly cemented that it cannot be excavated and removed with a power shovel except after thorough and continuous drilling and blasting.

.5 Backfilling: The operation of supplying and installing fill and approved soil materials.

.6 Engineered Fill: Approved material used to build-up to design elevations.

1.6 Examination

.1 Examine the building site and determine the nature and extent of the materials to be removed or the additional fill required to provide depths and levels indicated on drawings. Field check the site to review existing conditions. Verify locations of all existing utilities and services that will affect the work.

.2 Refer to drawings for all building and site development details.

1.7 Geotechnical Investigations

.1 During examination of the site, carry out such investigations as necessary to determine subsurface conditions to be encountered in constructing the Works.

.2 Notify the structural engineer and the inspection and testing company when excavation work commences for inspection and verification of soil conditions.

1.8 Setting Out Work

.1 The drawings indicate the building components location and proposed and final grades. Be responsible to construct the work according to levels and locations shown on the drawings. Report any errors or discrepancies to the Consultant before commencing work.

.2 Commencement of any part of the work shall constitute acceptance of drawings as being correct.

.3 Employ a competent instrument man and provide all lines and levels, limit lines and boundary stakes for the execution of the work as required. All bench marks shall be carefully protected.

.4 Provide and be responsible for, all lines, levels and dimensions which trades require to relate their work to the work of other trades. All trades shall be notified that all such levels and dimensions must be obtained from the Contractor.

1.9 Existing Underground Utilities

.1 Arrange underground locates of all utility assets prior to excavating. Do not commence excavation in a location prior to utility members marking the location of their utilities or indicating that none exist within the outlined excavation limits. Where necessary, employ the services of a private utility locator to ensure that all utilities are located in a timely manner.

.2 Verify the location and elevation of all existing utilities within the limits of the Work. Observe the locations of the stake outs, prior to commencing the Work. In the event there is a discrepancy between the locations of the stake outs and the locations shown on the Contract Documents, that may affect the Work, immediately notify the Consultant and the affected utility companies, in order to resolve the conflict.

.3 All existing buried utilities located within the excavation zone and any other facilities adjacent to the excavation shall be carefully supported and protected from damage as a result of the Contractor's operations. Be responsible for repairing any damaged underground utilities, as a result of actions during the course of the work at no extra cost to the Owner.

.4 All costs associated with this work shall be considered incidental to all related items of work in the Contract. No separate payment will be made for costs incurred in obtaining utility locates.

1.10 Protection of Existing Services

.1 Notify the Owner, Public Utility or Municipal authorities in advance of planned excavations adjacent to their services.

.2 Take care not to damage or displace encountered known and unknown services.

.3 When such services are encountered during the execution of work, immediately notify the Consultant and protect, brace and support active services. Where repairs to these services become necessary use the following procedure:
.1 Known services, repair at no expense to the Owner.
.2 Unknown services, forward to the Consultant a complete breakdown of the estimated cost of such work. Proceed only upon written authorization.

.4 In the case of damage to, or cutting off of an essential service, notify Consultant, the Owner, and Public Utility or Municipal authorities immediately and repair the service under the Consultant's direction.

1.11 Inspection and Testing

.1 Provide proper and sufficient samples, ample opportunity and access at all times for the Consultant or Testing Agency to inspect materials, operations and completed works carried out under this Section.

.2 Sample and test excavated material prior to shipping to landfill off the site. Samples shall be tested for compliance of acceptable material for landfill. Furnish to the Owner the results of all testing and location of landfill site used. This testing will not be undertaken by the Owner's Inspection and Testing Agency.

.3 Provide 24 hours notice to inspection laboratory and request tests as follows:
.1 Sieve Analysis: Proposed fill materials will be tested to confirm stability for intended use and conformity with specifications.
.2 Density Test: Tests will be conducted on compacted fill, to ASTM D698.
.3 Frequency Test: Excavated Surfaces: When existing compacted fill surface is being prepared, make a series of three tests of surface for each 500 m² area.
.4 Fills under Pavement or Slabs on Grade: Make three tests for every two lifts of compacted fill for each 500 m² area.
.5 Backfill Structural Walls: Test each different material for approximately each 30 metres of wall being backfilled at depth increments of 610 mm.

1.12 Standards

.1 Carry out all work in accordance with the applicable OPSS, OPSD and site drawings. The applicable Ontario Provincial Standard Specifications are listed hereafter.

.2 The following shall apply:
.1 OPS 180 Management and Disposal of Excess Material
.2 OPS 206 Grading, Nov. 2005
.3 OPS 314 Untreated Granular Subbase, Base, Surface, Shoulder and Stockpiling

.4 OPS 408 Adjusting or Rebuilding Maintenance Holes, Catch Basins Ditch Inlets and Valve Chambers
.5 OPS 805 Temporary Erosion and Sediment Control Measures

1.13 Shoring and Bracing

.1 Shoring and trench timbering, in addition to requirements of local authorities, shall be carried out in accordance with the requirements of The Occupational Health and Safety Act, "November 1992 Ontario Regulation 213/91" and Regulations for Construction Projects by Ontario Ministry of Labour and to Construction Safety Association brochure "Trenching Safety April 1994".

.2 Erect necessary shoring for excavations in such a manner that:
.1 Whenever a trench or excavated face is necessary, shore and brace to prevent failure. Engage a registered Professional Engineer fully qualified in this line of work to design, stamp shop drawings and assume responsibility for the shoring and bracing. Submit shop drawings to the Consultant.
.2 It will properly retain the banks of the excavations and prevent caving-in or displacement or damage to surrounding or adjacent buildings or other property.
.3 All other work in connection with this Contract, including the Mechanical and Electrical Trades, may be carried out while it is still in place if necessary.
.4 It will be entirely free of footings, foundation walls or other such work so that it may be removed entirely or in sections when it is no longer required or when directed, without causing any damage or injury to the structural work that has been completed.

1.14 Sedimentation Control

.1 Maintain and/or repair sedimentation control at all watercourses and catch basins to prevent contamination by excavated fill.

.2 Sedimentation control shall be in accordance with the Ontario Provincial Standard Specifications, OPSS 805 and local authorities.

.3 Refer to details and notes on site development drawings.

.4 Install additional sedimentation control as required and obtain Consultant’s approval prior to commencement of site works.

1.15 Dewatering

.1 Keep excavations and backfill dry at all times.

PART 2 PRODUCTS

2.1 Materials

.1 Type A Fill: Class "A" material conforming to OPSS1010, latest edition.

.2 Type B Fill: Class "B" material conforming to OPSS 1010, latest edition.

.3 Sand Fill: Clean, well graded compactable sand to OPSS 1010, Granular “M” fill.

.4 Crushed Stone: Crushed stone shall be composed of clean, hard, durable course gravel, or crushed rock fragments such that 100% of the particles pass the 18 mm sieve and not more than 10% of the particles pass the No. 4 sieve. No clay or other objectionable materials shall be present.

.5 Engineered Fill: fill placed below Type A and Type B fill to bring excavation to the design elevations. To be Type B fill or approved fill, approved in writing by the Consultant.

.6 Topsoil: Clean topsoil, imported material approved by the Consultant, and free from admixtures of subsoil, clay lumps, stones or roots over 25 mm diameter, free of toxic substances or any other foreign matter which would inhibit growth. Minimum 150 mm thickness and 500 mm at all planting beds.

.7 Silt fence: heavy duty geotextile, Mirafi Envirofence or equivalent.

PART 3 EXECUTION

3.1 Preparation

.1 Clearing: Refer to Section 31 10 00 - Site Clearing.

.2 Lines and Levels: Refer to Section 01 71 00 - Examination and Preparation.

.3 Stock Piles: Materials shall not be stockpiled on the site except with the prior approval of the Consultant. Where permitted, stockpile materials in a manner to prevent segregation and contamination. Piles not to exceed 2000 mm in height. Stockpile materials in a location and manner not interfering with ongoing operation and use of the site and building by the Owner.

.4 Install silt fencing as detailed and in accordance with reference standards.

3.2 Excavation Work

.1 Excavate to elevations and dimensions indicated or required by the work, plus sufficient space to permit erection of forms, shoring and inspection. Excavation shall be made to clean lines to minimize quantity of fill material required.

.2 Remove large rocks, stumps and other obstructions of whatever nature encountered in the course of excavation and haul away off the site. Remove all concrete, masonry, rubble or other construction debris encountered during the work.

.3 Unauthorized Excavation - Excavation to greater than required depth shall be corrected by the Contractor at his own expense in a manner as directed by the Consultant. Fill over-excavated areas under structure bearing surfaces and footings with concrete as specified for foundations.

.4 Keep excavation free of water by bailing, pumping or a system of drainage as required and provide pumps, suction and discharge lines or well points of sufficient capacity and maintain until such time as the permanent drainage system is installed or until the Consultant's approval of removal of equipment is obtained. Take all necessary measures to prevent flow of water into the excavation.

.5 Protect the bottom and sides of excavated pits and trenches from freezing. Protect also from exposure to the sun and wet weather to prevent cave-ins and softening of the bed upon which concrete or drains rest.

.6 Excavations must not interfere with the normal 45 degree plane of bearing from the bottom of any footing.

.7 Keep bottoms of excavations clean and clear of loose materials levelled and stepped at changes of levels with exception of excavations made for drainage purposes and those to slope as required.

.8 If the excavations reveal seepage zones, springs or other unexpected sub-surface conditions which may necessitate revisions or additions to any drainage system, inform the Consultant immediately so that remedial action can be taken.

.9 If removal of earth causes displacement of adjacent earth, the earth so disturbed shall be removed at no additional cost to the Owner.

.10 Conditions of Excavated Surfaces
- .1 Excavate to a depth sufficient to expose firm undisturbed subsoil, free of organic matter and to the Testing Agency's approval.
- .2 Remove soft, wet or unconsolidated ground and organic material encountered in excavating.
- .3 Should the nature of the sub-soil at the depths shown prove to be unsatisfactory to the Consultant for the placing of the concrete work, then upon the Consultant's written order, the Contractor shall excavate to greater depth until a satisfactory bottom is reached.

.11 Tolerances: General excavation shall be to the elevations shown on the drawings, plus or minus 25 mm.

3.3 Hydro Excavation

.1 Utilize hydro excavation services when working near and around known utilities to avoid damage.

3.4 Backfilling

.1 Proceed promptly with backfilling as the building progresses, and as work to be backfilled has been inspected and approved by the Consultant. The backfill in areas where settlement cannot be tolerated, e.g. service and footing trenches under the floor slab, should be compacted to at least 100 per cent of its Standard Proctor Maximum Dry Density. The backfill should be placed in lifts not greater than 200 mm thick in the loose state, each lift being compacted with a suitable compactor to the specified density.

.2 Do not commence backfilling operations until mechanical and electrical services has been inspected and approved by Consultant and authorities having jurisdiction. Existing floor subgrade must be proof rolled before backfilling.

.3 Withdraw shoring material during backfill. Lumber left in place without the Consultant's approval will not be paid for by the Owner.

.4 Backfill evenly on both sides of foundation walls to avoid unequal fill pressures on walls.

.5 Place fill around foundation walls and footings so that footings will have a minimum of 1200 mm coverage, measured at an angle of 45 degrees from bottom of footing to protect against frost until final grading is complete.

.6 Where fill is placed adjacent to structures or vulnerable building components or in restricted areas, the fill shall be compacted to the same degree as specified by suitable equipment approved by the Consultant. Avoid damage to or displacement of walls, columns, piers, underground services, and process/ production equipment.

.7 Add water in amounts required only to achieve the optimum moisture content, in accordance with ASTM D1557.

.8 Backfill shall be free of snow and ice, topsoil, construction debris and oversized boulders greater than 150 mm.

3.5 Rough Grading

.1 Preparation and Layout
- .1 Establish extent of grading by area and elevation.
- .2 Prior to commencement of grading work, establish location and extent of all underground utilities occurring in work areas. Maintain, reroute or extend as required. Pay all costs for this work, except costs borne by utilities companies.
- .3 Slope grade away from building as indicated on drawings.
- .4 Cut temporary drainage swales and create containment ponds and structures for temporary surface run-offs, until storm sewer system is installed.
- .5 Regrade all areas that retain or pond water.
- .6 Rough grade all areas to tolerance of plus or minus 50 mm.

3.6 Fills Under Concrete Slab

.1 The fill shall be deposited in layers of such thickness that the equipment being used for compacting can produce the specified density but in no cases, more than 200 mm thickness. If lumps are present in the material each layer shall be continuously disced in order to ensure proper compaction.

.2 The exposed subgrade shall be proof rolled to ensure its integrity. If the subgrade consists of engineered fill, the fill shall be compacted to at least 98% of its maximum Standard Proctor Dry Density for native materials or 100% compaction for Granular “A” and “B” materials, using equipment approved by the Consultant. Any loose, wet or deleterious material shall be sub-excavated and replaced by the Contractor with Type B Engineered fill which must be compacted to 98% Standard Proctor Maximum Density.

.3 Immediately after levelling, each layer of fill shall be thoroughly compacted by the use of approved mechanical equipment.

3.7 Compaction Density

.1 Use approved equipment for compaction. Maintain materials at optimum moisture content to obtain required compaction. Special care shall be taken to prevent disturbance of the existing subgrade and adjacent structures and equipment.

.2 Be responsible for damage to the subgrade and installed materials due to improper compaction methods. Make good to approval of the Consultant.

.3 The minimum density of fill in place shall be the following values of Standard proctor densities for corresponding locations in accordance with ASTM D698.

.1 Type A Fill: To 100% Standard Proctor Maximum Density.
.2 Type B Fill: To 100% Standard Proctor Maximum Density.
.3 Engineered Fill: To 98% Standard Proctor Maximum Density.

.4 If during progress of work, tests indicate that compacted materials do not meet specified requirements, remove defective work, replace and retest at own expense.

.5 Ensure compacted fills are tested and approved before proceeding with placement of surface materials.

3.8 Fill Locations

.1 Type A Fill:
.1 Under all interior and exterior concrete slabs 150 mm minimum thickness.
.2 Below all mechanical or electrical services, from 150 mm below invert, to springline.

.2 Type B Fill:
.1 Around all footings, foundations, grade beams and walls up to the underside of Type A fill.
.2 From top of approved compacted subgrade to underside of concrete slabs (interior or exterior) but not less than 200 mm thickness.

.3 Sand Fill:
.1 Below all mechanical or electrical services, minimum 150 mm deep.
.2 Above all mechanical or electrical pipes and trenches, from springline to 300 mm above pipe obvert.

.4 Crushed Stone: around all foundation drainage and subdrainage piping, minimum 200 mm thick.

.5 Engineered Fill: All fill locations up to the underside of Type B fill and where required to fill up to design elevations.

.6 Topsoil: at all areas to receive sod or hydraulic seeding, and in planting beds. Minimum 100 mm thickness unless noted otherwise.

.7 Site excavated material: as backfill to exterior side of foundation walls only when permitted and approved by the Geotechnical engineer and below all sodded or seeded areas up to underside of topsoil, but not within 600 mm of foundation walls or structures.

3.9 Water on Prepared Surfaces

.1 Promptly remove, by approved methods, water rising from seeping of the soil or resulting from rainfall wherever such water is on the surface of sub-grade soil and compacted fill.

.2 Where proper drainage and pumping is not carried out as specified herein, and any prepared sub-grade soil for under structural work, and any compacted fill for under concrete slabs, is softened or disturbed by water due to improper drainage and pumping, the Contractor shall remove the unsatisfactory soil and fill, and bear all incidental costs in connection with additional excavation and placing and compacting of granular fill under floor slabs.

3.10 Adjustments

.1 All manhole frames and covers, catch basin frames and covers, drains and valves including those existing scheduled to remain, shall be adjusted and set flush with finished elevation.

.2 Adjustments to manholes and catch basins shall be done using concrete adjustment units as per OPSS 408 and OPSD 704.010

3.11 Surplus Soil Disposal

.1 Surplus soil and excavated material shall be promptly removed and disposed of off the site at legal dump sites. Conform to local bylaw requirements for trucking and disposal. Complete testing as described in Part 1 of this specification.

3.12 Cleaning

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

.2 As excavation proceeds, keep roads and aisles clean of dirt and excavated material.

.3 Clean up and wash down to remove all dirt and excavated materials caused by the work of this section daily.

End of Section