PROJECT: NORTH OAKVILLE #3
CATHOLIC ELEMENTARY SCHOOL
& CHILDCARE FACILITY

CLIENT: HALTON CATHOLIC DISTRICT SCHOOL BOARD

PROJECT No.: 24106

DATE: NOVEMBER 2026

BINDER: A ARCHITECTURAL & STRUCTURAL



CONSULTANTS:

HOSSACK ARCHITECTURE
105-1939 IRONOAK WAY
OAKVILLE, ONTARIO L6H 3V8
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Salas O'Brien

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Project Number: 22457
MECHANICAL | ELECTRICAL | AQUATIC

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www.mgm.on.ca

FRP inc.
landscape.architects
1877 Davenport Road
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www.frpinc.ca

PROJECT NAME

North Oakville #3 Catholic Elementary School
3500 Post Road
Oakville, Ontario

PROJECT OWNER

HALTON CATHOLIC DISTRICT SCHOOL BOARD
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Tel: (905) 632-6300

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Part 1 Invitation

1.1 BID CALL

.1 Offers to perform **Contract C00 (Cost-Plus Fee Bid**), signed under seal, executed, and dated will be received by the Architect by email at:

admin@hossackarch.com

on or before

2:00:00 pm local time, on the **November 26, 2026.**

.2 Offers to perform **Subcontract SC01** through to **SC26**, signed under seal, executed, and dated will be received by the Architect by email at:

admin@hossackarch.com

on or before

2:00:00 pm local time, on the **November 26, 2026.**

.3 The Bidder shall submit their Electronic Submission in only one (1) email containing all the bid submission requirements to the email address above. Email attachments should be limited to 10MB in size (total).

.4 Proponents are cautioned that the timing of their Proposal Submission is based on when the Bid is received by the Architect at the email address above, not when a proposal is submitted by a Bidder, as Bid transmissions can be delayed in an "Internet Traffic Jam" due to file transfer size, transmission speed, etc.

.5 For the above reasons, the Purchaser recommends that Proponents allow sufficient time to email their Bid Submission and attachment(s) and to resolve any issues that may arise. The closing time and date shall be determined by the Purchaser's internal server clock.

.6 Include the Project Name clearly in the email subject field.

.7 Amendments to the submitted offer will be permitted if received at the email address above prior to bid closing and if endorsed by the same party or parties who signed and sealed the offer.

.8 Bids are by invitation only from lists of pre-selected bidders. Bids submitted by unsolicited bidders will not be received by the Owner and will be returned unopened.

1.2 INTENT

.1 The intent of this bid call is to obtain offers to perform identified portions of the Work to complete the construction of the new

North Oakville #3 CATHOLIC ELEMENTARY SCHOOL located at:

3500 Post Road, Oakville, Ontario**.**

.2 Contract C00 is identified as a Canadian Construction Documents Committee (CCDC) CCDC 3 - 2016 Cost Plus a Fee Contract based on the Contract Documents.

□

.3 Subcontracts SC01 through SC26 are identified as Canadian Construction Association (CCA) CCA 1- 2008 Stipulated Sum Subcontracts. Successful Subcontractors will enter into written agreements with the successful Contractor holding Contract C00, based on the Contract Documents.

.4 Contract C00 and Subcontract SC01 will be awarded to a single Contractor.

.5 Substantial Performance of the Work is required before the date identified in Section 01 12 00 Multiple Contract Summary.

1.3 CONTRACT DOCUMENTS IDENTIFICATION

.1 The Contract Documents are identified as Project No.: 24106 as prepared by Hossack Architecture located at 105-1939 Ironoak Way, Oakville, Ontario.

Part 2 Contract and Bid Documents

2.1 DEFINITIONS

.1 Contract Documents: As defined in the Contract.

.2 Bid Documents: As defined in Document 00 71 03.

.3 Bid, Offer, or Bidding: Defined as the act of submitting an offer under seal.

.4 Bid Price: Defined as the monetary sum identified by the Bidder in the Bid Form.

2.2 AVAILABILITY

.1 One set of Bid Documents may be obtained electronically by each bidder from the Consultant.

.2 Bid Documents are made available only for the purpose of obtaining offers for this project. Their use does not confer a license or grant for other purposes.

2.3 EXAMINATION

.1 Upon receipt of Bid Documents verify that documents are complete; notify Consultant should the documents be incomplete.

.2 Immediately notify the Consultant upon finding discrepancies or omissions in the Bid Documents.

2.4 QUERIES AND ADDENDA

.1 Direct queries in writing by email to:

Rabab Saghir
Hossack Architecture
Email: rsaghir@hossackarch.com and admin@hossackarch.com

□

.2 Addenda may be issued during the bidding period. All addenda become part of the 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 5 Working Days before date set for receipt of bids. The reply will be in the form of an addendum, a copy of which will be forwarded to known bidders no later than 2 Working Days before receipt of bids.

2.5 PRODUCT / SYSTEM OPTIONS

.1 Where Bid Documents stipulate a particular Product, requests for substitutions will not be considered by the Consultant less than 7 days before receipt of bids.

.2 When a request to substitute a Product is made, the Consultant may approve the substitution and will issue an Addendum to known bidders.

.3 When requesting a substitution to specified Products, include any changes required in the Work to accommodate such substitutions. A later claim by the bidder for an addition to the Contract Price resulting from changes in the Work necessitated by use of substituted Products will not be considered.

.4 Product or system substitutions recommended by Bidders at the time of receipt of bids may be considered by Consultant if submitted as an attachment to the Bid Form. Substitutions not approved in writing by the Consultant prior to the receipt of bids shall not be included in the base Bid Price. Refer to Section 01 25 00.

.5 Requests for Product or system substitutions submitted with the Bid Form will be evaluated and will be either included in, or excluded from, the Contract. The Consultant will be the sole judge as to their acceptability.

.6 Provide sufficient information to enable the Consultant to determine acceptability of such Product or system substitutions.

.7 Provide complete information on required revisions to other work to accommodate each Product or system substitution, the dollar amount of additions to or reductions from the Bid Price, including revisions to other work.

.8 Unless requests for substitutions are submitted prior to, or as part of the bid submission, and subsequently accepted, provide the specified Products.

.9 Prior approval to submit requests for substitutions is not required.

Part 3 Site Assessment

3.1 PRE-BID SITE EXAMINATION

.1 Visit the Place of the Work prior to submitting a bid.

.2 There is no organized mandatory site meeting for this project. Bidders are to independently visit the site prior to submitting a bid.

.5 No claims for extra payment to the successful Contractor will be allowed for the execution of additional work or difficulties encountered due to conditions at the Place of the Work which were visible or reasonably inferred from an examination of the Place of the Work and the available project information prior to receipt of the Bids.

Part 4 Qualifications

4.1 INVITED GENERAL CONTRACTORS

1. Everstrong Construction Ltd.
2. Garritano Bros Ltd.
3. Percon Construction Inc.
4. Tambro Construction Ltd.
5. TRP Construction
6. Pre-Eng Contracting Ltd.

4.2 INVITED MECHANCIAL CONTRACTORS

.1 Anvi Services Ltd.
.2 Besseling Mechanical Inc.
.3 CEC Mechanical Ltd.
.4 Mechfield
.5 L.J. Barton Mechanical Inc.
.6 Mattina Mechanical Ltd.
.7 Mekcon Mechanical Services

4.3 INVITED ELECTRICAL CONTRACTORS

.1 Best Electric Co.
.2 Cahill Electric Ltd.
.3 CEC Services Ltd.
.4 L.J. Barton Electrical Inc.
.5 Gremar Electrical Ltd.
.6 Elite Electrical
.7 Indcon Inc.

4.4 SUBCONTRACTORS

.1 The Owner reserves the right to reject a proposed Subcontractor for reasonable cause. Upon such rejection, the bidder will be required to propose an alternate subcontractor with a resulting change to the Bid Price. This change can effect the status of the low bid, and may result in a different bid becoming low.

.2 Refer to CCDC 3, GC 3.8 - Subcontractor and Supplier; and CCA 1, SCC 3.4 - Sub-subcontractors.

Part 5 Bid Submission

5.1 BID INELIGIBILITY

□

.1 Bids that are unsigned, improperly signed or sealed, conditional, illegible, obscure, contain arithmetical errors, erasures, alterations, or irregularities of any kind shall, at the discretion of the Owner, be declared non-compliant.

.2 Bids with Bid Forms and enclosures which are missing, incomplete or improperly prepared shall, at the discretion of the Owner, be declared non-compliant.

.3 Bids that fail to include the consent of surety (where applicable) or WSIB requirements shall, at the discretion of the Owner, be declared non-compliant.

.4 Bids based upon prices seeming to be so unbalanced as to adversely affect the interests of the Owner shall, at the discretion of the Owner, be declared non-compliant.

.5 Bids based upon an unreasonable period of time for completion of the Work shall, at the discretion of the Owner, be declared non-compliant.

5.2 SUBMISSIONS

.1 Bidders shall be solely responsible for the delivery of their bids in the manner and time prescribed.

.2 Submissions will be received by the Architect by email at **admin@hossackarch.com** on, or before the time noted earlier in this section or amended by addendum.

.3 Refer to the details noted in item "**1.1 Bid Call**" of this specification section.

.4 Submission emails shall attach a digital copy of the properly executed offer on the Bid Form(s) provided, along with additional requirements (such as Consent of Surety by General Contractors). Ensure the following is noted on the Bid Form(s):

.1 Relevant '**SC-_____**' Subcontract number and name (based on section 01 12 00 Multiple Contract Summary)
.2 Bidder's name and address
.3 Addenda numbers issued
.4 Fixed fee or Sub-Contract amount
.5 Buy Ontario Act Declaration information
.6 Signatures

.3 Bidders wishing to submit prices for more than one Contract or Subcontract may do so on separate bid forms, submitted in separate emails as described above. Do not combine information pertaining to multiple Contracts or Subcontracts on a single bid form. General Contractors may include 'C00 – Contractor' (Cost-Plus Fee Bid) and 'SC01 – General' forms in a single email submission."

Part 6 Bid Enclosures and Requirements

6.1 CONSENT OF SURETY

.1 Subcontractors who are required to acquire bonding shall submit with the Bid Form a Consent of Surety, stating that the identified surety is willing to supply the Performance Bond and Labour & Materials Payment Bond required.

.2 Include the cost of the Consent of Surety in the Bid Price.

□

.3 General Contractors are to submit 'Consent of Surety' with the Bid Form stating that the identified surety is willing to supply the Performance Bond and Labour & Materials Payment Bond for a construction value of $24,000,000.

6.2 PERFORMANCE ASSURANCE

.1 Specified Subcontractors will be required to acquire and submit a Performance Bond and a Labour & Materials Payment Bond as described in the Supplementary Subcontract Conditions.

.2 Include the cost of bonds in the Bid Price.

6.3 WORKPLACE SAFETY AND INSURANCE BOARD

.1 Provide a signed confirmation from the Workplace Safety and Insurance Board (WSIB) that, at the date of the letter, the bidder maintains an account with the WSIB, and is in good standing.

6.4 TAXES

.1 Unless specifically excluded by the Contract, include all applicable government taxes in the base Bid Price.

.2 The General Conditions of the Contract specifically excludes Value Added Taxes, such as the Harmonized Sales Tax, from the Contract Price.

.3 Refer to Supplementary Conditions for inclusion of taxes and procedures for tax rebate claims by the Owner.

6.5 BID FORM REQUIREMENTS

.1 The bidder, in submitting an offer, agrees to complete the Work by the date indicated in the Contract Documents.

.2 The Owner requires that the Work be completed as quickly and expeditiously as possible.

6.6 BID SIGNING

.1 Sign and seal the Bid Form prior to submission using the most appropriate of the following methods:

.1 Sole Proprietorship: Signature of sole proprietor in the presence of a witness who will also sign. Insert the words "Sole Proprietor" under the signature.

.2 Partnership: Signature of all partners in the presence of a witness who will also sign.

.3 Limited Company: Signature of a duly authorized signing officer(s) in their normal signatures. Insert the officer's capacity in which the signing officer acts, under each signature. Affix the corporate seal. If the bid is signed by officials other than the President and Secretary of the company, or the President-

Secretary-Treasurer of the company, a copy of the by-law resolution of the Board of Directors authorizing them to do so, must also be submitted with the Bid in the Bid submission.

.4 Joint Venture: Each party of the joint venture shall execute the Bid under their respective seals in a manner appropriate to such party as described above, similar to the requirements of a Partnership.

6.7 SUPPLEMENTS TO THE BID FORM

.1 The following Bid Form Supplements must be submitted with the Bid:

.1 Bid Form Supplement A - List of Bid Documents: A complete listing of all documents and information issued, from which the Bid Price was derived.

6.8 SUPPLEMENTS TO THE SUBCONTRACT BID FORM

.1 The following Bid Form Supplements must be submitted with the Bid:

.1 Bid Form Supplement A - List of Bid Documents: A complete listing of all documents and information issued, from which the Bid Price was derived.

Part 7 Offer Acceptance or Rejection

7.1 DURATION OF OFFER

.1 Bids shall remain open to acceptance and shall be irrevocable for a period of 60 days after the bid closing.

7.2 ACCEPTANCE OF OFFER

.1 The Owner reserves the right to accept or reject any or all offers.

.2 The Owner will award Contract C00 and Subcontract SC01 to the same bidder. In this instance, the lowest bidder will be determined by the aggregate sum of the Contractor's Fee identified for Contract C00 and the Subcontract Price for Subcontract SC01.

.3 The Owner reserves the right to negotiate with the lowest acceptable bidder to verify their Bid, undertake value engineering and consider the benefit of dividing the Work into multiple Subcontracts for the different Phases. The Owner may, at their sole discretion, reject a bid during such negotiations if sufficient information and cost breakdowns are not forthcoming within a reasonable time frame.

.4 After acceptance by the Owner, the Consultant, on behalf of the Owner, will issue to the successful bidder a written bid acceptance.

.5 After a bid has been accepted, all rejected bids will be returned to the respective bidders with submitted bid securities and other requested enclosures.

END OF SECTION

□

Part 1 General

1.1 THIRD-PARTY DOCUMENTS

.1 In addition to the Drawings and the Specifications, the Owner may also distribute a collection of reports, surveys and similar types of documents relevant to the Place of the Work that have been prepared by third-parties and are intended strictly as additional information for consideration by the bidders.

.2 Such reports have been prepared primarily for use by the Consultant. Recommendations contained therein are not considered a requirement of this Contract unless also stated as such, either specifically or by reference, in the Contract Documents.

.3 Bidders are cautioned that such documents, by their nature, cannot reveal all conditions that exist or can occur at the Place of the Work.

.4 Should conditions at the Place of the Work, in the opinion of the Consultant, be found to substantially vary from those identified in the third-party documents, then changes in the Work may need to be made, with appropriate adjustments being made to the Contract Price and Contract Time.

.5 Direct questions pertaining to third-party documents by contacting the authoring organization.

1.2 GEOTECHNICAL INVESTIGATION REPORTS

.1 A copy of a detailed geotechnical investigation report with respect to the Place of the Work is being made available as part of the Bid Documents in Binder C; titled as follows:

PROJECT NAME: **Geotechnical Investigation**
Proposed North Oakville #3 Catholic School
Oakville, Ontario
Prepared by: Forward Engineering & Associates Ltd.
Project No. : G7565
Date: January 27, 2026

Soil Chemical Testing Report
North Oakville #3 Catholic Elementary School
Post Road and Settlers Road East
Oakville, Ontario
Prepared by: Forward Engineering & Associates Ltd.
Project No. : 7565
Date: December 8, 2025

.2 Such reports record properties of the soils and include recommendations for the design of foundations and pavements.

□

1.3 DESIGNATED SUBSTANCE SURVEYS AND AUDITS

.1 A copy of a designated substance audit report with respect to the Place of the Work is being made available as part of the Bid Documents in Binder C; titled as follows:

Titled: Not applicable

.2 Such reports identify locations and types of designated substances present at the Place of the Work and may include recommendations for their safe removal and disposal.

1.4 DOCUMENTS DESCRIBING THE EXISTING FACILITY

.1 Documents describing the existing facility are available for viewing by bidders at the Owner's office.

.2 These documents were prepared by others and neither the Owner nor the Consultant can take responsibility for the accuracy of the information nor verify that they represent the actual conditions at the Place of the Work.

END OF SECTION

□

COST-PLUS FEE BID

Project No.: 24106

Project: Construction of the new
North Oakville #3 CATHOLIC ELEMENTARY SCHOOL

Located At: 3500 Post Road, Oakville, Ontario

For: The Halton Catholic District School Board
802 Drury Lane, Burlington, Ontario L7R 2Y2

Bidder
Legal Name: _____
(Company Name)

Address: _____
(Business Address)

_____
(City, Province, Postal Code)

Bid Price

Having examined the **Bid Documents** and Addenda No. _____to _____inclusive, all as issued by Hossack Architecture and having visited the Place of the Work; we hereby offer to enter into a Contract to perform the Work required by the Bid Documents for the Cost of the Work, plus:

A fixed fee of: _____Dollars

and _____cents ($_____)

in Canadian funds, which price excludes Value Added Taxes (such as HST).

The fixed fee above <u>includes</u> the Cash Allowance amount as outlined in specification section 01 11 00 Summary or Work, item 1.37 Cash Allowances.

Appendices to Bid: When requested, information on Subcontractors, Unit Prices, Alternative Prices, Separate Prices and Itemized Prices is provided in the attached Appendices and forms an integral part of this Bid. These prices do not include Value Added Taxes.

Interest:
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 payments on such unpaid amounts as stated in Article A-8 PAYMENT shall also become due and payable until payment. The prime rate shall be the rate of interest quoted by CIBC for prime business loans as it may change from time to time.

Bid Documents: DRAWINGS: As listed on the Cover Sheet of the Drawings
SPECIFICATIONS: As listed in 00 01 10 - TABLE OF CONTENTS

Declarations:

We hereby declare that:

(a) We agree to perform the Work in compliance with the required completion schedule stated in the Bid Documents;

(b) No person, firm or corporation other than the undersigned has any interest in this Bid or in the proposed Contract for which this Bid is made;

(c) This Bid is open to acceptance for a period of Sixty (60) days from the date of bid closing.

Signatures

SIGNED AND SUBMITTED for and on behalf of:

_____
(name of bidder)

_____
(signature)

_____ Witness
(name and title of person signing)

_____ _____
(signature) (signature)

_____ _____
(name and title of person signing) (name and title of person signing)

Date: _____

N.B. W here legal jurisdiction or Owner requirement calls for:
- a) proof of authority to execute this Bid, attach such proof of such authority in the form of a certified copy of a resolution naming the representative(s) authorized to sign this Bid for and on behalf of the Corporation or Partnership; or
- b) the affixing of a corporate seal, this Bid should be properly sealed.

STIPULATED PRICE SUBCONTRACT BID

Project No.: 24106

Subcontract No. SC -_____

Project: Construction of the new
North Oakville #3 CATHOLIC ELEMENTARY SCHOOL

Located At: 3500 Post Road, Oakville, Ontario

For: The Halton Catholic District School Board
802 Drury Lane, Burlington, Ontario L7R 2Y2

Subcontract Bidder
Legal Name: _____
(Company Name)

Address: _____
(Business Address)

_____
(City, Province, Postal Code)

Subcontract Bid Price

Having examined the **Bid Documents** and **Addenda No.** _____to _____ inclusive, all as issued by Hossack Architecture and having visited the Place of the Work; we hereby offer to enter into a Subcontract to perform the Work of **Subcontract SC-** _____ required by the Bid Documents for the stipulated price of:

_____Dollars

and _____cents ($_____)

in Canadian funds, which price excludes Value Added Taxes (such as HST).

Interest:
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 payments on such unpaid amounts as stated in Article A-8 PAYMENT shall also become due and payable until payment. The prime rate shall be the rate of interest quoted by CIBC for prime business loans as it may change from time to time.

Bid Documents: DRAWINGS: As listed on the Cover Sheet of the Drawings
SPECIFICATIONS: As listed in 00 01 10 - TABLE OF CONTENTS

Buy Ontario Act:

As outlined in specification Section '01 11 10 Buy Ontario', this tender and construction must comply with the 'Buy Ontario Procurement Directive' with goals to maximize the use of Ontario-Made and Canadian-Made Good and Services, while maintaining value for money and the timely delivery of the work.

A Domestic Supply Chain Plan (DSCP) will be formed by the consultant from the information provided by contractors in this 'Stipulated Price Subcontract Bid' form, in compliance with the requirements of the *Buy Ontario Procurement Directive*, which outlines the origin and sourcing strategy for major goods and services required for the construction of the proposed work.

Refer to Section 01 11 10 Buy Ontario for definitions.

In accordance with the Buy Ontario Procurement Directives, a 10% evaluation advantage to the bidder with the highest proportion of Ontario-Made Goods and Ontario Services will be applied, followed by Canadian-Made Goods and Canadian Services.

Declarations:

We confirm that we shall not substitute goods or services with those that do not comply with the Buy Ontario Act. Any substitutions shall be subject to the Consultants' and Board's approval.

1.1.1. The undersigned Bidder commits to:

.1 Prioritizing Ontario-based suppliers and subcontractors.
.2 Engaging local labour and trades wherever possible.
.3 Ensuring transparency in sourcing decisions.
.4 Maintaining documentation to verify origin of goods and services.
.5 Mitigating supply chain risks through diversified domestic sourcing.
.6 Have identified specified materials that do not comply with the directive to the tender facilitator during tender. For overlooked items, we commit to provide alternates that meet the requirements of the specification and mandate within the tender/contract price.

1.1.2. The undersigned Bidder declares, to the best of our knowledge based on our investigations and selections during the Bidding phase, the following Goods and Services source location percentage for the sub-contract goods and services:

Subcontract No.	**Location**	**Content (%)**
SC -_____	**Ontario** ……..…	_____%
	Canada ……..…	_____%
	Non-Domestic …… *(list other countries below)*	_____%
	_____	
	_____	
	_____	

1.1.3. We hereby declare that:

(a) We agree to perform the Subcontract Work in compliance with the required completion schedule stated in the Bid Documents.

(b) No person, firm or corporation other than the undersigned has any interest in this Bid or in the proposed Contract for which this Bid is made;

(c) We agree to enter into a Subcontract Agreement, as identified in the Contract Documents, with the successful Contractor;

(d) This Bid is open to acceptance for a period of Sixty (60) days from the date of bid closing.

Signatures

SIGNED AND SUBMITTED for and on behalf of:

_____
(name of bidder)

_____
(signature)

_____ Witness
(name and title of person signing)

_____ _____
(signature) (signature)

_____ _____
(name and title of person signing) (name and title of person signing)

Date: _____

N.B. W here legal jurisdiction or Owner requirement calls for:
a) proof of authority to execute this Bid, attach such proof of such authority in the form of a certified copy of a resolution naming the representative(s) authorized to sign this Bid for and on behalf of the Corporation or Partnership; or
b) the affixing of a corporate seal, this Bid should be properly sealed.

Part 1 General

1.1 AGREEMENT

.1 The CCDC 3-2016 Cost Plus Contract, as amended below, forms the basis of Agreement between the Owner and the Contractor.

1.2 AMENDMENTS TO THE AGREEMENT

.1 Article A-4 - Cost of the Work

.1 Delete Paragraph A-4.1 in its entirety and replace with the following: "The Cost of the Work, which excludes Value Added Taxes, shall be comprised of the stipulated sum costs of subsequently awarded Subcontracts, as nominated by the Owner, and the following:

.1 deposits lost;

.2 the costs to the Contractor that result from any Subcontractor's or Supplier's insolvency or failure to perform;

.3 royalties, patent license fees and damages for infringement of patents and cost of defending suits therefor subject always to the Contractor's obligations to indemnify the Owner as provided in paragraph 10.3.1 of GC 10.3 - PATENT FEES;

.4 losses and expenses sustained by the Contractor for matters which are the subject of insurance under the policies prescribed in GC 11.1 - INSURANCE when such losses and expenses are not recoverable because the amounts are in excess of collectible amounts or within the deductible amounts;

.5 legal costs, incurred by the Contractor, in relation to the performance of the Work provided that they are not caused by negligent acts or omissions of the Contractor and the Work is performed in accordance with the Contract Documents; and

.6 the cost of auditing when requested by the Owner.

Notwithstanding the foregoing and any provisions contained in the General Conditions of the Contract, it is the intention of the parties that the Cost of the Work referred to herein shall cover and include any and all contingencies other than those which are the result of or occasioned by any failure on the part of the Contractor to exercise reasonable care and diligence in the Contractor's attention to the Work. Any cost due to failure on the part of the Contractor to exercise reasonable care and diligence in the Contractor's attention to the Work shall be borne by the Contractor."

.2 Article A-5 - Contractor’s Fee

.1 Delete Paragraph A-5.1.1 in its entirety.

□

.3 Article A-7 - Options
  .1 Delete Paragraph A-7.2 in its entirety.
  .2 Delete Paragraph A-7.3 in its entirety.

.4 Article A-8 - Payment
  .1 Revise Subparagraph A-8.1.1 to insert the phrase "... make progress payments to Contractor subject to GC 5.4 - Progress Payment...".

END OF SECTION

□

Part 1 General

1.1 AGREEMENT

.1 The CCA 1-2008 Stipulated Price Subcontract, as amended below, forms the basis of Agreement between the Contractor and the Subcontractor.

1.2 AMENDMENTS TO THE AGREEMENT

.1 Delete Article 1B in its entirety.

.2 Delete Article 2B in its entirety.

.3 Delete Article 3B in its entirety.

.4 Article 5 - SUBCONTRACT PRICE, delete Paragraph 5.5 in its entirety.

.5 Article 6 - PAYMENT, Paragraph 6.2, Third Sentence; revise to read as follows: "The Contractor shall pay the Subcontractor, in accordance with the payment procedures required
by the Contract Documents, no later than thirty (30) days after the date of the Consultant's certificate of payment, 90 percent of the amount applied for or such other amount as the Consultant determines to be properly due."

.6 Article 6 - PAYMENT, Paragraph 6.4; revise to read as follows: "... and for which the Contractor or Owner might in any way be held responsible ..."

.7 Article 6 - PAYMENT, Paragraph 6.4; delete Subparagraph 6.4.2 in its entirety.

END OF SECTION

□

Part 1 General

1.1 AGREEMENT

.1 The CCDC 3-2016 Cost Plus Contract, includes the Definitions of specific words and terms.

1.2 SUPPLEMENTARY DEFINITIONS

.1 Amend the Definition of the term Contract Documents by inserting the words "in writing" after the words "agreed upon".

.2 Amend the Definition of the term Contractor's Fee by adding the following: "... and including amounts for all overhead and profit, bond and insurance premiums, and any costs for labour and Products required by the Contractor to undertake portions of the Work identified in the Contract Documents and not included in an Owner-nominated Subcontract."

.3 Delete the Definition of the term Guaranteed Maximum Price ("GMP") in its entirety.

.4 Delete the Definition of the term Target Contract Price in its entirety.

.5 Add a new Definition for Bid Documents, as follows: "The Bid Documents shall consist of the Contract Documents, Instructions to Bidders, Bid Form, and other available project information issued for the benefit of bidders."

END OF SECTION

□

Part 1 General

1.1 AGREEMENT

.1 The CCA 1-2008 Stipulated Price Subcontract includes the Definitions of specific words and terms.

1.2 SUPPLEMENTARY SUBCONTRACT DEFINITIONS

.1 Add a new Definition for Bid Documents, as follows: "The Bid Documents shall consist of the Contract Documents, Instructions to Bidders, Bid Form, and other available project information issued for the benefit of bidders."

END OF SECTION

□

Part 1 General

1.1 GENERAL CONDITIONS

.1 CCDC 3-2016, The General Conditions of the Cost Plus Contract is the General Conditions between the Owner and Contractor.

1.2 SUPPLEMENTARY CONDITIONS

.1 Refer to Supplementary Conditions for amendments and supplements to the General Conditions.

END OF SECTION

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Part 1 General

1.1 SUBCONTRACT CONDITIONS

.1 CCA 1-2008, The Subcontract Conditions of the Stipulated Price Subcontract are the Subcontract Conditions between the Contractor and the Subcontractors.

1.2 SUPPLEMENTARY SUBCONTRACT CONDITIONS

.1 Refer to Supplementary Subcontract Conditions for amendments and supplements to the Subcontract Conditions.

END OF SECTION

□

Part 1 Supplements to General Conditions

1.1 GC 1.1 - CONTRACT DOCUMENTS

.1 Delete Paragraph 1.1.8 and replace with the following: "The Contractor will be given two hard-copy sets and one electronic-copy set of the Contract Documents without charge. The Contractor may produce as many additional hard-copy sets of the Contract Documents from the electronic-copy as they deem necessary to undertake the Work, at their own expense."

.2 Add new Paragraph 1.1.11 as follows: "The location of fixtures, outlets, conduit, piping and any other locations shown or specified but not dimensioned shall be considered approximate. The actual location shall be as approved by the Consultant and as required to suit job conditions."

1.2 GC 2.2 - ROLE OF THE CONSULTANT

.1 Add new Subparagraph 2.2.7.1 as follows: "Verbal instructions, regardless of the source, will not be binding on the parties to the Contract, unless otherwise confirmed in writing by the Owner or the Consultant ."

1.3 GC 2.4 - DEFECTIVE WORK

.1 Add new Paragraph 2.4.3 as follows: "Where defective work or work not performed as provided in the Contract Documents is the responsibility of a Subcontractor or Supplier, the Contractor shall require the responsible Subcontractor or Supplier to Make Good the defective work or work not performed as provided in the Contract Documents so as to conform with the Contract Documents."

1.4 GC 3.2 - CONSTRUCTION BY OWNER OR OTHER CONTRACTORS

.1 Delete Paragraph 3.2.2 in its entirety.

.2 Add new Subparagraph 3.2.2.5 as follows: "Notify the Contractor no later than 2 Working Days prior to any other contractor or their own forces being on site. The Contractor will make all necessary arrangements to accommodate access and maintain compliance with applicable health and construction safety legislation at the Place of the Work".

.3 Revise Subparagraph 3.2.3.4 to read as follows: "Assume overall responsibility for the separate contractors and Owner's own forces and for compliance with applicable health and construction safety legislation at the Place of the Work".

1.5 GC 3.5 - CONSTRUCTION SCHEDULE

.1 Add new Paragraph 3.5.2 as follows: "Where portions of the Work are performed by Subcontractors or Suppliers, the Contractor shall coordinate with, and arrange for the Subcontractors and Suppliers to provide detailed construction schedules for their portion of the Work, to be submitted along with the construction schedule described herein."

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.2 Add new Paragraph 3.5.3 as follows: "No change in Contract Time resulting from a change in the Work will be accepted, if, in the Consultant's opinion, such change in the Work can reasonably be accommodated within the approved schedule."

.3 Amend Paragraph 3.5.1.1 by deleting the phrase "... the first application for payment ..." and replacing it with "... commencing the work ...".

1.6 GC 3.7 - SUBCONTRACTORS AND SUPPLIERS

.1 Revise Subparagraph 3.7.1.1 to read as follows: "enter into contracts or written agreements with Subcontractors or Suppliers, including those nominated by the Owner, to require them to perform their work as provided in the Contract Documents;

.1 The Consultant will prepare the written agreements between the Contractor and each Subcontractor or Supplier, based upon a modified CCA 1-2008, Stipulated Price Subcontract, similar in content and intent of this Contract."

.2 Add new Subparagraph 3.7.1.4 as follows: "immediately notify the Consultant of any acts or omissions of Subcontractors or Suppliers and of persons directly or indirectly employed by them."

.3 Add new Subparagraph 3.7.2.1 as follows: "The Contractor shall not change or terminate Subcontractors or Suppliers without the prior written permission of the Owner."

.4 Add new Paragraph 3.7.6 as follows: "The Owner may direct the Contractor to terminate the contract of a Subcontractor or Supplier and the Owner shall nominate a replacement Subcontractor or Supplier to complete that part or portion of the Work. The Contractor shall enter into a contract with the nominated Subcontractor or Supplier for the completion of that portion of the Work. In the event of such an instance, the Contract Time and the Contractor's Fee is to be adjusted by an appropriate amount. The Contractor may reasonably refuse to terminate the contract of a Subcontractor or Supplier if to comply with the Owner's direction would result in a breach of any of the Contractor's obligations under GC 9.4 - CONSTRUCTION SAFETY."

.5 Add new Paragraph 3.7.7 as follows: "The Contractor shall involve the Consultant in any communications with the Subcontractors or Suppliers related to GC 3.5 – CONSTRUCTION SCHEDULE and PART 6 - CHANGES IN THE WORK. The Consultant may discuss issues directly with the Subcontractors and Suppliers related to GC 3.5 – CONSTRUCTION SCHEDULE and PART 6 - CHANGES IN THE WORK , however, the Consultant shall not direct or supervise the Work."

.6 Add new Paragraph 3.7.8 as follows: "The Contractor shall enter into contracts or written agreements with Subcontractors for the Subcontracts identified in the Contract Documents. Such Subcontractors may be union or non-union affiliated. The Contractor shall not be party to any agreement that would prevent them from entering into such Subcontracts."

1.7 GC 3.8 - LABOUR AND PRODUCTS

□

.1 Add new Paragraph 3.8.3 as follows: "The Contractor will cooperate with the Owner to avoid labour complications and will employ workers whose presence and work will be acceptable to, and be in harmony with, other workers employed on the Work, and under conditions satisfactory to the Owner. In the event of labour difficulties resulting from the employment of workers by the Contractor or by the presence of the Contractor on the Project, the Contractor will make any necessary arrangements as required by the Owner in order to prevent delays and additional expense to the Owner."

.2 Add new Paragraph 3.8.4 as follows: "The Contractor is responsible for the safe on-site storage of Products and their protection (including Products supplied by the Owner) in such a way to avoid dangerous conditions or contamination to the Products or other person or property."

1.8 GC 4.1 - CASH ALLOWANCES

.1 Delete Paragraph 4.1.1 in its entirety.

.2 Revise Paragraph 4.1.6 by deleting the phrase "... and the Guaranteed Maximum Price ...".

.3 Add new Paragraph 4.1.8 as follows: "Unexpended Cash Allowances will be deducted from the Contract Price."

1.9 GC 5.2 - ACCOUNTING AND AUDIT

.1 Revise Paragraph 5.2.1 by replacing the phrase "... Cost of the Work as in accordance with Article A-3 - CONTRACT DOCUMENTS." with "... payments under the Contract."

.2 Revise Paragraph 5.2.2 by replacing the phrase "... Cost of the Work ..." with "... payments under the Contract ...".

1.10 GC 5.3 - APPLICATIONS FOR PROGRESS PAYMENT

.1 Revise Paragraph 5.3.1 to read as follows: "The Contractor shall make monthly applications for payment on account as provided in Article A-8 of the Agreement - PAYMENT as the Work progresses."

1.11 GC 5.4 - PROGRESS PAYMENT

.1 Revise Subparagraph 5.4.1.3 to read as follows: "The Owner shall make payment to the Contractor on account as provided in Article A-8 of the Agreement - PAYMENT no later than fourteen calendar days after the date of a certificate for payment by the Consultant."

.2 Add a new Paragraph 5.4.2 as follows: "The Contractor shall make payments to the Subcontractors and Suppliers in the amounts certified as payable by the Consultant, no later than twenty calendar days after the date of the certificate for payment."

1.12 GC 5.5 - SUBSTANTIAL PERFORMANCE OF THE WORK

.1 Add new Paragraph 5.5.4 as follows: "The Contractor's application for a Certificate of Substantial Performance of the Work shall, without limiting the foregoing, include the following:

.1 A written statement to the Owner and the Consultant stating that:

.1 The Contract is substantially performed,

.2 The performance of the balance of the Contract is in process, and identifying the date when this Work will be completed. Where portions of the Contract can not be completed forthwith for reasons beyond the Contractor's control, the Contractor shall indicate completion dates for each outstanding portion of the Work."

.2 A statement showing the amount of holdback monies due for release and payment following the issue of the Certificate of Substantial Performance of the Work.

.3 A statement of completion with the cost value of:

.1 the portion of the Work to be completed, including any defective work or work not performed as provided in the Contract Documents.

.2 portions of the Work which can not be performed for reasons beyond the control of the Contractor.

.4 The submission of all data, operating instructions, maintenance manuals, record drawings, spare parts and materials, evidence of all tests, instructions to Owner's representatives, warranties and any other such documents to enable the Owner to operate and maintain the Project."

.2 Add new Paragraph 5.5.5 as follows: "When making an application for Substantial Performance of the Work, the Contractor shall submit to the Consultant all specified warranties, bonds, maintenance manuals, records, certificates and a Statutory Declaration in a form acceptable to the Consultant, signed by the Contractor, stating that all material, work and services in connection with the Contract have been paid in full, up to the holdback, and that no liens exist, including a receipt from each Subcontractor and Supplier, stating that it has been paid in full up to the holdback for all services and materials supplied in connection with this Contract, and such other statements as the Owner and Consultant may require."

1.13 GC 5.8 - FINAL PAYMENT

.1 Revise Paragraph 5.8.4 by replacing the words "... five calendar days ..." to read "... fourteen calendar days ...".

.2 Add new Paragraph 5.8.5 as follows: "Subject to the lien legislation applicable to the Place of the Work, the Contractor shall make payments to the Subcontractors and Suppliers in the amounts certified as payable by the Consultant, no later than twenty calendar days after the date of the certificate for payment."

□

1.14 GC 6.2 - CHANGE ORDER

.1 Revise Paragraph 6.2.1 by deleting the phrase "... GMP or the Target Contract Price; ..." and replacing it with "... Contract Price; ...".

.2 Revise Paragraph 6.2.2 by deleting the phrase "... GMP, Target Contract Price, ..." and replacing it with "... Contract Price ...".

.3 Add new Paragraph 6.2.3 as follows: "The value of a change to the Contractor's Fee shall be charged as a percentage of the actual increase to the Cost of the Work, as follows:

.1 On additional work performed by the Contractor's own forces: 5 percent;

.2 On additional work performed by Owner-Nominated Subcontractors and Suppliers: 0 percent; and

.3 On additional work performed by Contractor-appointed Subcontractors and Suppliers: 5 percent."

1.15 GC 6.3 - CHANGE DIRECTIVE

.1 Revise paragraph 6.3.1 by deleting the phrase "... in the GMP, in the Target Contract Price, ..." and replacing it with "... in the Contract Price, ...".

.2 Revise paragraph 6.3.7 by deleting the phrase "... to the GMP, to the Target Contract Price, ..." and replacing it with "... to the Contract Price, ...".

.3 Add new Paragraph 6.3.8 as follows: "The value of a change to the Contractor's Fee shall be charged as a percentage of the actual increase to the Cost of the Work, as follows:

.1 On additional work performed by the Contractor's own forces: 5 percent;

.2 On additional work performed by Owner-Nominated Subcontractors and Suppliers:0 percent; and

.3 On additional work performed by Contractor-appointed Subcontractors and Suppliers: 5 percent."

1.16 GC 7.2 - CONTRACTOR'S RIGHT TO TERMINATE CONTRACT

.1 Add new Paragraph 7.2.6 as follows: "If the Contractor stops the Work or terminates the Contract as provided for in the preceding paragraphs, he shall ensure that the Place of the Work and the Work are left and maintained in a secure and safe condition as required by authorities having jurisdiction and these Contract Documents."

1.17 GC 9.1 - PROTECTION OF WORK AND PROPERTY

.1 Add new Paragraph 9.1.5 as follows: "Should there be a stoppage of the Work, for any cause, the Contractor shall assume all responsibility for protecting the Work and Provide and maintain security to the Work and the Place of the Work during such periods, with appropriate adjustments being made to the Contractor's Fee and Contract Time when it

can be proven that the stoppage of the Work was not caused by any action or lack of action on the part of the Contractor."

1.18 GC 9.4 - CONSTRUCTION SAFETY

.1 Amend Paragraph 9.4.1 by deleting the phrase "Subject to paragraph 3.2.3.4 of GC 3.2 - CONSTRUCTION BY OWNER OR OTHER CONTRACTORS".

.2 Add new Paragraph 9.4.2 as follows: "The Contractor shall comply and cause all of its subcontractors and Suppliers to comply with all applicable provisions, requirements, and safety standards of the Ontario Occupational Health and Safety Act and regulations thereto. The Contractor shall be designated and hereby accepts the responsibilities and designation as "constructor" under the Occupational Health and Safety Act on the project and hereby assumes all liabilities and obligations imposed on a "constructor" by the Occupational Health and Safety Act".

.3 Add new Paragraph 9.4.3 as follows: "Prior to commencement of the Work, the Contractor shall submit to the Owner:

.1 Documentation of a valid Workplace Safety and Insurance Board clearance certificate and confirmation of the Contractor's WSIB CAD-7 performance rating.

.2 Documentation of the Contractor's insurance coverage.

.3 Documentation of the Contractor's safety-related programs for the Project.

.4 A copy of the Notice of Project filed with the Ministry of Labour."

.4 Add new Paragraph 9.4.4 as follows: "The Contractor hereby represents and warrants to the Owner that appropriate health and safety instruction and training has been provided and will be provided to the Contractor's employees before the Work is commenced and agrees to provide to the Owner and Consultant satisfactory proof of such instruction and training. The Contractor further undertakes to verify that other contractors and the Owner's own forces have received appropriate health and safety instruction and training in accordance with GC 3.2."

.5 Add new Subparagraph 9.4.4.1 as follows: "The Contractor shall require proof from the Subcontractors and Suppliers that appropriate health and safety instruction and training has been provided to the Subcontractor's and Supplier's employees before the Work is commenced. This information will be kept on file at the site."

.6 Add new Paragraph 9.4.5 as follows: "The Contractor shall tour the appropriate area to familiarize itself with the job site prior to the commencement of the Work",

.7 Add new Paragraph 9.4.6 as follows: "The Contractor shall never work in a manner that may endanger anyone".

.8 Add new Paragraph 9.4.7 as follows: "The Contractor shall indemnify and save harmless the Owner, together with the Owner's agents, officers, directors, employees, consultants, successors and assigns, from and against any and all safety infractions under the Ontario

Occupational Health and Safety Act, and regulations thereto including the payment of all legal fees on a solicitor and client basis."

.9 Add new Paragraph 9.4.8 as follows: "The Contractor shall ensure that its employees, Subcontractors and Suppliers comply with the foregoing conditions".

1.19 GC 10.1 - TAXES AND DUTIES

.1 Add new Paragraph 10.1.2 as follows: "With respect to taxes and duties, the Contractor shall, at the request of the Owner, assist, join in, or at the Owner's expense, make application on behalf of the Owner for any exemption, recovery or refund. The Contractor shall provide the Owner with copies, or, where required original of records, invoices, purchase orders or other documentation as may be necessary to support such application."

.2 Add new Paragraph 10.1.3 as follows: "Any amount included in the Contract or any Subcontract for tax or duty, whether or not paid, which is found to be inapplicable or for which a refund is obtained shall become the sole and exclusive property of the Owner."

1.20 GC 10.2 - LAWS, NOTICES, PERMITS & FEES

.1 Add to Paragraph 10.2.2 as follows: “The Contractor shall take all necessary steps to obtain the occupancy permit, including delivering any notice of completion of the building required by the authorities having jurisdiction.”

.2 Add new Paragraph 10.2.8 as follows: "The Contractor's or its Subcontractor's or Supplier's compliance with statutes or regulations made thereunder or by-laws shall not relieve them of obligations set out in the Contract Documents which may be more extensive than the requirements of those statutes, regulations or by-laws."

1.21 GC 11.1 - INSURANCE

.1 Delete Subparagraph 11.1.1.1 in its entirety and replace with the following: "General liability insurance shall be in the joint names of the Contractor, the Owner, the Consultant, and any and all Subcontractors and subconsultants involved in the Work, with limits not less than $5,000,000 per occurrence and with a property damage deductible not exceeding $5,000. The insurance coverage shall include at least the following extensions: Premises, Property and Operations; Occurrence basis, Owners/Contractors protective, Products and Completed Operations; Blanket Contractual; Employees as Additional Insureds; Broad Form Property Damage; Broad Form Loss of Use; Personal Injury; Incidental Malpractice; Contingent Employers Liability; Cross Liability/Severability of Interests; Non-Owned Automobile Liability including Endorsement Form 96; Intentional Injury to protect persons or property, X-plate/unlicensed/specially licensed vehicles; Attached Machinery; Hostile fire exception to any pollution exclusion; Voluntary Medical Payments. To achieve the desired limit, umbrella or excess liability insurance may be used. All liability coverage shall be maintained for the completed operations hazard from the date of Substantial Performance of the Work, for 24 months following. The Policy shall be

endorsed to provide the named insured with not less than 30 days notice in writing in advance of any cancellation or change or amendment restricting coverage."

.2 Delete Subparagraph 11.1.1.2 in its entirety.

.3 Delete Subparagraph 11.1.1.3 in its entirety.

.4 Delete Subparagraph 11.1.1.4 in its entirety.

.5 Delete Subparagraph 11.1.1.5 in its entirety.

.6 Delete Subparagraph 11.1.1.6 in its entirety.

.7 Delete Subparagraph 11.1.1.7 in its entirety.

.8 Add new Paragraph 11.1.7 as follows: "Notwithstanding the fact that a claim has been made under any insurance policy described in GC 11.1, the Contractor shall continue to perform its obligations under the Contract ."

1.22 GC 12.3 - WARRANTY

.1 Add new Paragraph 12.3.7 as follows: "Should the Work be delayed due to conditions beyond the control of the Contractor, the warranty period shall commence at the time of acceptance of the Work by the Owner."

.2 Add new Paragraph 12.3.8 as follows: "Where warranty repairs on such parts or portions of the Work become necessary, the Consultant will notify the Contractor which Subcontractor or Supplier is responsible to rectify the defective work or work not performed as provided in the Contract Documents."

END OF SECTION

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Part1 Supplements to Subcontract Conditions

1.1 SCC 1.1 – DOCUMENTS

.1 Delete Subparagraph 1.1.7.2 in its entirety.

.2 Revise Paragraph 1.1.8 as follows: "The Consultant shall provide the Subcontractors, without charge, ..."

.3 Add new Paragraph 1.1.9 as follows: "The location of fixtures, outlets, conduit, piping and any other locations shown or specified but not dimensioned shall be considered approximate. The actual location shall be as approved by the Consultant and as required to suit job conditions."

1.2 SCC 2.2 - REVIEW AND INSPECTION OF THE WORK

.1 Revise Paragraph 2.2.2 as follows: "... the Subcontractor shall give the Contractor and Consultant timely notice requesting inspection."

1.3 SCC 2.3 - DEFECTIVE WORK

.1 Revise Paragraph 2.3.1 as follows: "The Subcontractor shall within 5 Working Days remove from the Place of the Work and Make Good defective work that has been rejected by the Contractor or Consultant as failing to conform to the Contract Documents ...".

1.4 SCC 3.4 - SUB-SUBCONTRACTORS

.1 Revise Subparagraph 3.4.1.3 as follows: "be as fully responsible to the Contractor, Owner and Consultant for acts and omissions of Sub-Subcontractors and of persons directly or indirectly employed by them as for acts and omissions of persons directly employed by the Subcontractor."

.2 Revise Paragraph 3.4.6 as follows: "The Contractor or Consultant may provide to a Sub-Subcontractor information as to the percentage ...".

1.5 SCC 3.5 - SHOP DRAWINGS

.1 Revise Paragraph 3.5.2 as follows: "The Consultant shall determine the number of copies of Shop Drawings ...the Subcontractor shall notify the Contractor and Consultant in writing of any deviations ...".

1.6 SCC 3.7 - CUTTING AND REMEDIAL WORK

.1 Revise Paragraph 3.7.3 as follows: "... nor alter the work of any others without the Contractor's and Consultant's written consent, where such member, existing work or other work is apparent from the Subcontract Documents, reasonable examination or instruction of the Consultant."

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.2 Add a new Paragraph 3.7.6 as follows: “Each Subcontractor shall make allowances in his own work to accommodate other Subcontractor's work. The Contractor shall coordinate the cutting and remedial work amongst Subcontractors such that all pieces come together properly."

1.7 SCC 4.1 - CASH ALLOWANCES

.1 Revise Paragraph 4.1.3 to read as follows: "Expenditures under cash allowances shall be authorized by the Consultant."

1.8 SCC 5.1 - APPLICATIONS FOR PAYMENT

.1 Revise Paragraph 5.1.2 as follows: "The Subcontractor shall submit to the Contractor for the Consultant's approval before the first application ..."

.2 Revise Paragraph 5.1.3 as follows: "... supported by such evidence as the Consultant may reasonably direct and when accepted by the Contractor, with the approval of the Consultant, shall ..."

.3 Add new Paragraph 5.1.6 as follows: "Each application for payment must include the Subcontractor's GST Registration number."

.4 Add new Paragraph 5.1.7 as follows: "The Subcontractor shall submit with every application for payment, a "Certificate of Standing" from the Workplace Safety & Insurance Board (WSIB) stating that the Subcontractor has complied with the requirements of the Workers' Compensation Act and is in good standing as of the date of the Certificate."

1.9 SCC 6.1 - CONTRACTOR'S RIGHT TO MAKE CHANGES

.1 Revise Paragraph 6.1.1 as follows: "The Contractor, with the approval of the Consultant, and without invalidating the Subcontract, may make changes ...".

.2 Add new Paragraph 6.1.3 as follows: "The Subcontractor shall respond to requests for information pertaining to Changes within 10 Working Days of receipt of such requests."

1.10 S CC 6.2 - CHANGE ORDER

.1 Revise Paragraph 6.2.2 as follows: "When the Contractor, with the approval of the Consultant, and the Subcontractor agree ..."

.2 Add new Paragraph 6.2.3 as follows: "The value of a change shall be determined by actual credits and cost to the Subcontractor. Where additional work is required, the value of the change shall be the actual cost plus a percentage covering overhead and profit, after all credits included in the change have been deducted. The following percentage fee for overhead and profit shall be applied to additional work:

.1 On work performed by the Subcontractor's own forces: the Subcontractor may charge a maximum of 5 percent combined percentage for overhead and profit;

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.2 On work performed by Sub-Subcontractors, the Sub-Subcontractors may charge a maximum of 5 percent combined percentage for overhead and profit; and

.3 On work performed by Sub-Subcontractors, the Subcontractor may charge a maximum of 5 percent combined percentage for overhead and profit on work performed by the Sub-Subcontractors."

1.11 SCC 6.3 - CHANGE DIRECTIVE

.1 Revise Paragraph 6.3.1 as follows: Insert "... prior to the Contractor receiving the approval of the Consultant..."

.2 Revise Paragraph 6.3.6 as follows: "The value of a change shall be determined by actual credits and cost to the Subcontractor. Where additional work is required, the value of the change shall be the actual cost plus a percentage covering overhead and profit, after all credits included in the change have been deducted. The following percentage fee foroverhead and profit shall be applied to additional work:

.1 On work performed by the Subcontractor's own forces: the Subcontractor may charge a maximum of 5 percent combined percentage for overhead and profit;
.2 On work performed by Sub-Subcontractors, the Sub-Subcontractors may charge a maximum of 5 percent combined percentage for overhead and profit; and
.3 On work performed by Sub-Subcontractors, the Subcontractor may charge a maximum of 5 percent combined percentage for overhead and profit on work performed by the Sub-Subcontractors."

.3 Revise Subparagraph 6.3.7.1 as follows: "... under a salary or wage schedule approved by the Contractor and the Consultant, or in the absence ..."

.4 Revise Paragraph 6.3.12 as follows: "If the Contractor, does not have the approval of the Consultant or the Contractor and the Subcontractor do not agree ...".

.5 Revise Paragraph 6.3.13 as follows: "When the Contractor, with the approval of the Consultant, and the Subcontractor reach an agreement on the adjustment to the Subcontract Price and to the Subcontract Time...."

1.12 SCC 6.4 - CONCEALED OR UNKNOWN CONDITIONS

.1 Revise Paragraph 6.4.1 as follows: "... shall notify the other party and the Consultant ...".

.2 Revise Paragraph 6.4.2 as follows: "The Contractor and the Consultant will promptly investigate such conditions and the Consultant will make a finding.... "

.3 Revise Paragraph 6.4.3 as follows: "If the Consultant finds that the conditions ... are not materially different ... the Consultant shall report the reasons for his finding to the Contractor and Subcontractor in writing."

1.13 SCC 6.5 – DELAYS

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.1 Revise Paragraph 6.5.1 as follows: "... then the Subcontract Time shall be extended for such reasonable time as the Contractor, with the approval of the Consultant and the Subcontractor shall agree that the Subcontract Work was delayed. The Subcontractor shall be reimbursed for reasonable costs incurred by the Subcontractor as a result of such delay."

.2 Revise Paragraph 6.5.2 as follows: "... then the Subcontract Time shall be extended for such reasonable time as the Contractor, with the approval of the Consultant and Subcontractor shall agree that the Subcontract Work was delayed. The Subcontractor shall be reimbursed for reasonable costs incurred by the Subcontractor as a result of such delay."

.3 Revise Paragraph 6.5.4 as follows: "... unless notice in writing of claim is given to the Contractor and Consultant not later than ...".

.4 Revise Paragraph 6.5.5 as follows: "... no request for extension shall be made as a result of failure of the Contractor or Consultant to furnish instructions ...".

1.14 SCC 7.2 - SUBCONTRACTOR'S RIGHT TO STOP THE SUBCONTRACTS WORK OR TERMINATE THE SUBCONTRACTS

.1 Revise Paragraph 7.2.1 as follows "...terminate the Subcontract and such notice shall be provided to the Consultant."

.2 Revise Paragraph 7.2.2 as follows: "...terminate the Subcontract and such notice shall be provided to the Consultant."

.3 Revise Paragraph 7.2.3 to read as follows: "The Subcontractor may notify the Contractor in writing that the Contractor is in default of their contractual obligation if payment is not received as stated in Article 4 of the Subcontract Agreement - PAYMENT and the Subcontractor shall provide a copy of such notice to the Consultant"

.4 Revise Paragraph 7.2.4 by deleting the phrase "... to the Contractor ...". Add a new Sentence to read as follows: "The Owner may remedy the Contractor's default and the Subcontractor agrees to continue to complete the Subcontract Work for the Owner or a new Contractor nominated by the Owner".

1.15 SCC 9.2 - TOXIC OR HAZARDOUS SUBSTANCES AND MATERIALS

.1 Revise the last sentence in Paragraph 9.2.2 as follows: "The expert's report shall be delivered o the Consultant, the Contractor and the Subcontractor."

.2 Revise Subparagraph 9.2.3.3 as follows: "extend the Subcontract Time for such reasonable time as the Contractor, with the approval of the Consultant, and in consultation with the Subcontractor ...".

1.16 SCC 9.4 - CONSTRUCTION SAFETY

.1 Add new Paragraph 9.4.2 as follows: "Prior to commencement of the Work, the Subcontractor shall submit to the Contractor:

.1 Documentation of a valid Workplace Safety and Insurance Board clearance certificate and confirmation of the Subcontractor's WSIB CAD-7 performance rating.
.2 Documentation of the Subcontractor's insurance coverage.
.3 Documentation of the Subcontractor's safety-related programs for the Project.
.4 A copy of the Subcontractor's Form of Notification."

1.17 SCC 9.5 – MOULD

.1 Revise the last sentence in Subparagraph 9.5.1.3 as follows: "The expert's report shall be delivered to the Consultant, the Contractor and the Subcontractor."

.2 Revise Subparagraph 9.5.2.3 as follows: "extend the Subcontract Time for such reasonable time as the Contractor, with the approval of the Consultant, and in consultation with the Subcontractor ...".

1.18 SCC 10.1 - TAXES AND DUTIES

.1 Add new Paragraph 10.1.3 as follows: "With respect to taxes and duties, the Subcontractor shall, at the request of the Contractor, assist, join in, or at the Contractor's expense, make application on behalf of the Contractor for any exemption, recovery or refund. The Subcontractor shall provide the Contractor with copies, or, where required original of records, invoices, purchase orders or other documentation as may be necessary to support such application."

.2 Add new Paragraph 10.1.4 as follows: "Any amount included in the Subcontract for tax or duty, whether or not paid, which is found to be inapplicable or for which a refund is obtained shall become the sole and exclusive property of the Contractor."

1.19 SCC 10.2 - LAWS, NOTICES, PERMITS & FEES

.1 Revise Paragraph 10.2.5 as follows: "... the Subcontractor shall notify the Contractor and Consultant in writing requesting direction immediately upon such variance or change becoming known. The Consultant will make the changes required to the Contract Documents...".

.2 Revise Paragraph 10.2.6 as follows: "If the Subcontractor fails to notify the Contractor and the Consultant in writing; and ...".

.3 Add new Paragraph 10.2.8 as follows: "The Contractor's and Subcontractor's compliance with statutes or regulations made thereunder or by-laws shall not relieve them of obligations set out in the Contract Documents which may be more extensive than the requirements of those statutes, regulations or by-laws."

1.20 SCC 11.1 – INSURANCE

.1 Revise Paragraph 11.1.1 as follows: "Without restricting the generality of SCC 12.1 - INDEMNIFICATION, the Contractor will arrange for a project specific 'Wrap-up Liability' policy in the amounts of not less than $5,000,000 per occurrence with a property damage deductible not exceeding $5,000 on behalf of, and indemnification of the Owner, the

Consultants, the Contractor, the Subcontractors, and any other parties as instructed by the Owner. The Subcontractor shall be responsible for the following insurance policies:

.1 "Subcontractor's Equipment Insurance covering construction machinery and equipment used by the Subcontractor for the performance of the Work. Such insurance shall be on an 'all risks' basis and be endorsed to provide the Consultant and the Owner with not less than 30 days notice in writing in advance of any cancellation, and of any change or amendment restricting coverage.

.2 "Automobile liability insurance in respect of licensed vehicles with limits of not less than $5,000,000 inclusive per occurrence for bodily injury, death and damage to property, and covering all licensed vehicles owned or leased by the Subcontractor. This automobile liability insurance shall be endorsed to provide the Consultant and the Owner with not less than 30 days notice in writing in advance of any cancellation, and of any change or amendment restricting coverage. Where the policy has been issued pursuant to a government-operated automobile system, the Subcontractor shall provide the Owner with confirmation of automobile insurance coverage for all automobiles registered in the name of the Subcontractor."

1.21 SCC 11.2 - CONTRACT SECURITY

.1 Delete Paragraph 11.2.2 in its entirety.

.2 Add new Paragraph 11.2.3 as follows: "Those Subcontractors listed in Paragraph 11.2.5 shall provide a Performance Bond in the joint names of the Contractor and the Owner (as dual obligees) for Fifty Percent (50%) of the Subcontract Price, to assure the faithful performance of the Contract, including corrections to the Work required under GC 12.2 - Warranty; on Performance Bond Form, CCDC 221."

.3 Add new Paragraph 11.2.4 as follows: "Those Subcontractors listed in Paragraph 11.2.5 shall also provide a Labour and Material Payment Bond in the joint names of the Contractor and the Owner (as dual obligees) for Fifty Percent (50%) of the Subcontract Price, to assume faithful payment of monies by the Subcontractor to its suppliers of labour and material ; on Labour and Material Payment Bond Form, CCDC 222."

.4 Add new Paragraph 11.2.5 as follows: "The following Subcontractors are to provide the specified bonding:

.1 SC02 - Mechanical, and

.2 SC03 - Electrical."

1.22 SCC 12.1 – INDEMNIFICATION

.1 Add new Paragraph 12.1.7 as follows: "The Subcontractor shall indemnify and hold harmless the Contractor, the Owner, and the Consultant, their agents and employees from and against claims, demands, losses, costs, damages, actions, suits, or proceedings (hereinafter called "claims"), suffered or incurred on account of any obligation or a provision in the Subcontract Documents, or attributable to, the Subcontractor's performance of the Subcontract. The Subcontractor assumes towards the Contractor all the obligations and responsibilities that Contractor assumes towards Owner as set forth in the Contract Documents, insofar as

applicable, generally or specifically, to the materials to be furnished and the Work to be performed under this Subcontract".

1.23 SCC 12.3 – WARRANTY

.1 Add new Paragraph 12.3.7 as follows: "Should the Work be delayed due to conditions beyond the control of the Subcontractor, the warranty period shall commence at the time of acceptance of the Work by the Owner."

END OF SECTION

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Part 1 eneral

1.0 SECTION INCLUDES

1.1 Precedence
1.2 Relations of Trades
1.3 Additional Drawings
1.4 Existing Site Conditions
1.5 Work within an Existing Occupied Building
1.6 Construction Sequencing
1.7 Temporary Construction Fencing
1.8 Contractor Parking
1.9 Bylaws, Permits and Approvals
1.10 Organization
1.11 Seismic Design Requirements
1.12 Canadian Products and Local Labour
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1.14 Quality Control
1.15 Protection of Other Work
1.16 Fastenings
1.17 Supply and Install
1.18 Occupation Before Completion
1.19 General Requirements
1.20 Coordination
1.21 Access to the Project
1.22 Subtrade Awards
1.23 Safety Data Sheets
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1.25 Site Superintendents and Project Managers
1.26 General Contractor's Responsibilities
1.27 Manufacturers' Instructions
1.28 Air and Vapour Seal
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1.36 Contingency Allowance
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1.38 Allowances Carried in Divisions 15 and 16
1.39 Schedule of Allowances
1.40 Polychlorinated Biphenyl (PCB)
1.41 Use of Consultant's Digital Drawings
1.42 Building Dimensions
1.43 Setting of the Work & Required Surveys
1.44 Layout of Work
1.45 Documents Required: Start, During & Close Out.

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1.1 PRECEDENCE

.1 This Section contains Articles prepared which represent the Owner standards and policies. In all cases this Section is intended to be read in conjunction with and to coordinate with all other Sections. In the case of discrepancy between this Section and other Sections to more stringent Articles of any applicable Section shall apply.

1.2 RELATIONS OF TRADES

.1 The Contract Specifications have been generally divided into trade sections for the purpose of ready reference.

.2 The Contractor is responsible for coordinating all trades. He is solely responsible for determining the lines of demarcation between Contractor and/or trades. Neither the Consultant nor the Owner, assume any responsibility for any such determination or for any dispute arising concerning it. No extras will be considered due to any such dispute concerning either labour or materials.

.3 Specifications and drawings form an integral part of the Contract Documents. Any subject or item omitted from one, but which is mentioned or reasonably implied in the other, shall be considered as properly and sufficiently specified and will be part of the Work.

1.3 ADDITIONAL DRAWINGS

.1 Consultant may furnish additional drawings to assist proper execution of the Work. These drawings will be issued for clarification only. Such drawings, however, shall have the same meaning and intent as if they were included with plans referred to in the Contract Documents.

1.4 EXISTING SITE CONDITIONS

.1 Refer to geotechnical report in Binder C for existing soil information and construction requirements.

.2 Refer to the Soil Testing Report chemical analysis results in Binder C for disposal purposes. It should be noted that the acceptance of fill materials depends on the discretion of the receiving site.

.3 Refer to Drawings for additional grading, removals, new driveways and service connections and reinstatement for areas beyond property lines and coordinate Permits requirements with Section 00 21 13 – Instructions to Bidders.

.4 Sub-division Developer will be providing some modifications to the roadway boulevard to accommodate the bus lay-by lane, as described on the site drawings. Timing of work is to be coordinated with the this General Contractor for site servicing and other related site work.

.5 At the outset of the contract and before any other work begins, the contractor shall review grades on site to confirm compliance with the contract documents. Failure to do so at this initial stage shall eliminate the contractor’s right to make claim regarding incorrect grades or site surface conditions at any later stage for the work.

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.6 Contractor is responsible to quantify all on-site material to achieve design grades and is responsible for the importation or exportation of material from the site as required.

.7 Ascertaining the specific site and building conditions as they relate to the project is the responsibility of the contractor. Notwithstanding this overriding responsibility the consultant has made every effort to properly represent existing site conditions as they are evident at the time of tender.

.8 The Contractor shall assume the work site based on the existing conditions as shown on the drawings and visible on the job site at the time of the closing of the tender. All excavation, stockpiling, removal, importing and/or grading of soils is to be included in the work of this Contract. Refer to site plan drawings. The contractor shall also refer to the recommendations of the soils investigation records which are included for information, and report any discrepancies to the consultant prior to submitting a tender.

.9 Minor adjustments to the level of sodded areas, berms, etc., may be permitted, to the prior approval of the Consultant and owner. It must be stressed that it will be the contractor's responsibility to negotiate and obtain approval for any such changes with the Authorities having Jurisdiction over lot grading approvals for this project. Completion delays due to such approvals shall not be entertained.

.10 Inspection of the site during the tender period is mandatory for all Contractors. In addition, refer to the front-end documents for the time of a *conducted* contractors' site tour.

1.5 WORK WITHIN AN EXISTING OCCUPIED BUILDING

.1 Refer also to *Section 01 35 23 – 'Site Safety Protocol for Occupied Buildings'*.

.2 The contractor is reminded that work to these projects shall begin during the months of the active school year. Access restrictions to portions of the work apply and are outlined within this section under Construction Sequencing. Therefore, precise scheduling and sequencing of the various work areas is required as addressed herein. Refer also to drawings for locations as described.

.3 At all times it is the Owner of the school who is the authority responsible for the well-being of the school occupants. As such, the Contractor's Site Superintendent must establish a working rapport with the Owner or his/her designee, suitable to provide daily notification of proposed construction timing and activities.

.4 During the occupied school year absolutely no contracting personnel are allowed in the school building during operating hours other than in those work areas designated within this Section under Construction Sequencing, or by express permission of the Owner and under the direct supervision of the Contractor's Site Superintendent.

.5 During the school year, if the school is occupied, the General Contractor shall designate a full-time flag person to control construction traffic access and egress to any construction access points and at times as stipulated in articles in this Section and elsewhere in these specifications. Costs for compliance to execute work under these terms is to be carried by all trades as part of the base contract price.

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.6 Connection of any services must be made after hours and in such a way that it leaves no disturbance to materials or systems, nor any exposed construction conditions within the operating school area.

.7 The General Contractor shall maintain construction fencing and hoarding and through access to fire routes at all times.

.8 Catering trucks are not permitted on the school site whatsoever.

.9 During the school year, the Contractor shall minimize nuisances to the school operation such as loud noise, percussion sounds from power tools, dust, odours. Due to noxious fumes, roofing and asphalt paving shall be done after hours (after 4:00 p.m., or during the weekends). Hot asphalt kettles may not be heated until after 4:00 p.m. on weekdays without prior permission from the school Owner and Owner Project Manager.

.10 *Refer also to Section 01 52 00- 'Construction Facilities' and Section 01 56 00- 'Temporary Barriers and Enclosures'*

1.6 CONSTRUCTION SEQUENCING

.1 Completion Dates:

.1 Complete the work so that the work is *Fit for Occupancy/Substantially Performed* by the required date for occupancy in the Contract.
.2 Following *Substantial Performance* complete deficiencies to site works and renovations to the existing building such that project Total Completion is achieved by the required date

1.7 TEMPORARY CONSTRUCTION FENCING

.1 THIS PROJECT HAS BEEN DESIGNATED AS BEING IN A BUILT-UP SUBDIVISION.

.2 For the sake of safety to the neighbours and users of the school in which this project is being constructed, the Owner insists that fencing and hoarding be provided for every construction project, as described below.

.3 At the locations shown on drawings, provide temporary, 6'-0" high (1.8 m) wood hoarding and chain link fencing complete with main and truck gates around entire perimeter of work area, as shown on drawings. Gates shall be locked when no work is in progress, and located as shown on the Site drawings, unless approved by the consultant.

.4 The Owner requires that the installation of this construction fencing be accomplished as the first task of the General Contractor when he moves onto the site.

.5 Ensure for the duration of the contract that surrounding the work site, the construction fencing, siltation fencing and man and truck gates, are provided and maintained. This fence shall be locked when no work is in progress, and located as shown on the site plan drawing.

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1.8 CONTRACTOR PARKING

.1 Refer to section 01 52 00 Construction Facilities.

1.9 BYLAWS, PERMITS AND APPROVALS

.1 Nothing indicated on the Drawings or Specifications is intended to be in conflict with any law, by-law or regulation of Municipal, Provincial, or similar Authority Having Jurisdiction.

.2 Work of this Contract must conform with such laws, by-laws and/or regulations. Any required variation to, or deviation from, the drawings and specifications, shall be performed in accordance with the Contract contained in these specifications.

.3 Furnish inspection certificates and/or permits as may be applicable as evidence that the installed Work conforms with laws, by-laws and regulations of Authorities Having Jurisdiction.

.4 Each subtrade shall obtain and pay for all permits and licenses required by Municipal, Provincial, or other authorities having Jurisdiction, particular to their trade.

.5 It is the final responsibility of the General Contractor to obtain all the required approvals and permits, which the exception of the Building Permit, which has been applied for by the Consultant and paid for by the Owner.

.6 To facilitate the construction start of this project, partial building permits have been applied for to allow foundation, under-slab plumbing and site servicing work to commence as quickly as possible.

.7 Any revisions or deviations to Contract Documents required by any Authorities Having Jurisdiction must be reviewed by the Consultants before implementation.

1.10 ORGANIZATION

.1 Organize the Work of each section as required for satisfactory and expeditious completion of the Work. Take field dimensions required for the Work. Fabricate and install work to suit field dimensions and conditions.

.2 If applicable, take into account existing work to ensure best arrangements of components in available space. Contact the Consultant prior to commencing Work in critical locations and interface with other Contractors' Work.

.3 Provide all forms, templates, anchors, sleeves, inserts and accessories required to be installed in the Work. Set in place, or instruct the applicable subtrade as to their location. Pay costs of extra work, if required, as a result of a failure to comply with these requirements at the proper time.

.4 Before starting his work and from time to time as the work progresses, each Subcontractor shall examine the work and materials installed by the other Subcontractors insofar as it effects his own work, and the General Contractor shall promptly notify the Consultant IN

WRITING, if any condition exists that will prevent any Subcontractor from giving a satisfactory result in his own work.

.5 Should any Subcontractor start his own work without such notification, it shall be construed as an acceptance by him of all preceding work and as a waiver of all claims or questions as to its suitability for receiving his work.

1.11 SEISMIC DESIGN REQUIREMENTS

.1 This project requires adherence to seismic design requirements as stipulated in OBC 2012, Div. B, Part 4. The General Contractor shall be responsible to coordinate all disciplines to ensure compliance with these requirements for all applicable building components.

.2 All disciplines including Mechanical & Electrical shall make reference to individual specification section and the seismic lateral load table on Drawing S01 which outlines components requiring compliance with seismic design.

.3 As a minimum standard, design for all connections to meet seismic forces shall be included in base bid whether specifically stated in specific specification sections or not.

.4 Shop drawings shall clearly include seismic design compliance calculations for all building components within scope of OBC 2006, Div. B, Part 4 requirements.

.5 Refer to Structural Drawing for a table of applicable building components and Section 13 05 41 – 'Seismic Restraint for Non-structural Components'.

1.12 CANADIAN PRODUCTS AND LOCAL LABOUR

.1 To the extent that the same are available and consistent with the proper economy and expeditious completion of the Contract, Canadian equipment, materials, products and other such applicable items are preferred by the Owner to be used in the Work, wherever possible and practical.

1.13 MATERIALS AND WORKMANSHIP

.1 All materials shall be new and the best of their respective kinds, where a specific grade or brand is not indicated. Pre-packaged materials shall be delivered and stored in unopened containers.

.2 All work performed under this Contract shall be done by mechanics skilled in their respective trades. They shall make use of such templates, jigs or special tools as may be required for the operation involved.

.3 The acceptance of any materials or workmanship shall not be a bar to their subsequent rejection, if found defective.

.4 Adequate, dry storage facilities shall be provided and all stored materials shall be protected from damage and theft.

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.5 All Contractors will do Work in accordance with the best industry practice of the type of work specified, unless the Contract Documents stipulate more precise requirements, in which case, the more precise requirements shall govern.

.6 Do Work in a neat, plumb & square manner. Ensure that various work components are properly installed, forming tight joints and appropriately aligned junctions, edges and surfaces, free of warps, twists, waves, or other such irregularities.

.7 Wherever indicated on the drawings or specifications, or in the manufacturers' / suppliers' written instructions, arrange to have manufacturers' / installer's representatives inspect the Work which incorporates their materials, products or items.

.8 Do not permit materials to come in contact with other materials such conditions may result in corrosion, staining, discolouration or deterioration of the completed Work. Provide compatible, durable separators where such contact is unavoidable.

.9 The design of the Work is based on the full interaction of its component parts. No provisions have been made for conditions occurring during construction. Ensure that no part of the Work is subjected to a load which will endanger its safety or which might cause permanent deformation.

.10 Conceal pipes, ducts, conduit, wiring and other such items requiring concealment preferably in, wall or ceiling construction of all finished areas. If in doubt as to method of concealment, or intent of the Contract Documents in this regard, request clarification from the Consultant before proceeding with the Work.

.11 Lay out mechanical and electrical work well in advance of concrete placement and furring installation to allow for proper concealment. Test and inspect Work before applying pipe covering and before it is concealed.

.12 Provide and maintain control lines and levels required for the Work. Lay out the Work in accordance with these lines and levels and dimensions indicated on the drawings.

.13 Verify lines, levels and dimensions and report any errors or inconsistencies on the drawings to the Consultants.

.14 Final responsibility of satisfactory completion of all the Work, however, lies with the General Contractor.

1.14 QUALITY CONTROL

.1 Refer also to Section 01 45 00.

.2 The Consultants and authorized Owner staff shall have access to all areas of the Work, including any off site construction facilities.

.3 The General Contractor shall give timely notice requesting inspection if Work is designated for special tests, inspections, or approvals by the Consultants, or any other authorized Owner staff or testing and Inspection Company.

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.4 If the General Contract covers, or permits to be covered Work that has been designated as outlined above, he shall uncover such work, have the inspections and tests satisfactorily completed and make good such work at no additional cost to the Owner.

.5 The Consultants or the authorized Owner Staff may order any part of the Work to be examined, if such Work is suspected not to be according to the Contract Documents. If, upon examination, such work is found not to be in accordance with the Contract Documents, then the General Contractor shall correct such Work and pay for cost of examinations and correction. If such Work is found to be in full accordance with the Contract Documents, the Owner shall pay for the cost of examination and making good.

.6 If defects are revealed during inspection and/or testing, the appointed agency may request additional inspection and/or testing to ascertain the full degree of defects. The General Contractor shall correct the defects and irregularities as reported by the inspection and/or testing agency, at no additional cost to the Owner and the General Contractor shall pay all associated costs for retesting and reinspection.

.7 The General Contractor shall provide any tools, materials or equipment that may be required by the inspection and/or testing agencies in retesting the Work (*e.g.* Video camera rental to reinspect incorrectly installed sewer lines.)

.8 The employment of inspection and/or testing agencies does not, in any way, affect the General Contractor's responsibility to perform the Work in strict accordance with the Contract Documents.

.9 The General Contractor shall remove all defective work, whether the result of poor workmanship by him or his subtrades, use of defective or damaged products, whether or not incorporated into the Work and any Work that has been rejected by the Consultants or authorized Owner Staff as failing to conform to the Contract Documents. Replacement and execution of the affected Work shall be done in full accordance with the Contract Documents, making good other trades' work damaged by such removals or replacements at no additional charge to the Owner.

.10 If, in the opinion of the Consultant and/or the authorized Owner Staff, it is not expeditious to correct the defective Work, or Work not performed in accordance with the Contract Documents, the Owner, may, at its sole discretion, deduct from the Contract Price, the difference in value between the work performed and that required by the Contract Documents, the amounts of which shall be determined by the Consultant.

.1 The notable exception to the above item is a faulty installation of base and asphalt paving. If, the inspection agency, after performing random test holes to determine compaction and thickness of sub base, base and asphalt, determines that either one or both, are not according to what was specified in the Contract Documents, the Owner will not accept credits for such inconsistencies but rather, demand that any such installation be removed and redone in its entirety, at the pleasure and convenience of the Owner, but within the first year of the warranty period.

1.15 PROTECTION OF OTHER WORK

.1 Each trade shall avoid damage to other trades and shall take all measures necessary and provide all masking and materials necessary, to provide adequate protection.

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.2 Each Subcontractor shall be held responsible for all damage to work installed by others that is caused by this work or by anyone employed by him.

.3 Patching and repairing of damaged work shall be done by the Contractor who installed the work, as directed by the Consultant, but the cost of same, shall be paid for by the Contractor who is responsible for the damage.

1.16 FASTENINGS

.1 All fastenings must be permanent, of same metal, or compatible with any metals with which they are in contact, of adequate size and spacing, to ensure permanent anchorage against load or shear.

.2 Exposed fastenings must be evenly spaced, neatly laid out and must not mar surfaces of prefinished materials.

.3 No ram-setting or similar techniques will be permitted, without prior written approval of the Consultant.

1.17 SUPPLY AND INSTALL

.1 Unless specifically noted, "*supply only*", any reference to supply intends the **supply and installation** of material or item so noted.

1.18 OCCUPATION BEFORE COMPLETION

.1 If the General Contractor, for any reason, does not have the Project completed by the specified completion date and the Owner, of necessity, is forced to occupy any part of the building before the whole of the Work is completed, the Contractor will not be entitled to any indemnity for interference with his operation.

1.19 GENERAL REQUIREMENTS

.1 All Contractors shall examine carefully all drawings and specifications to inform themselves fully of all conditions and limitations pertaining to the work of the contract.

.2 All Contractors shall co-operate and co-ordinate their work for the proper completion of the work, including co-ordination of delivery dates and commencement of subtrades work.

.3 The responsibility and costs for all work, including temporary structures, shoring, shoring design (if applicable) and erection shall at all times rest with the General Contractor and his Subcontractors. The Consultant will review construction methods and shop drawings for general arrangements only. The method of obtaining the results contemplated by the Contract Documents shall be determined by the General Contractor.

.4 The undertaking of period site review by the Consultant or Owner Representative shall not be construed as supervision of actual construction, nor make them responsible for providing a safe place for work, visit, use, access, travel, or occupancy of the Consultant's or Owner's employees or agents.

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.5 The General Contractor shall be fully responsible for coordinating and expediting the work of all Subcontractors and shall employ the necessary and qualified personnel to provide the required quality of labour and materials and to prevent delays in the progress of the project. Each trade shall be afforded all reasonable opportunities for the installation of its work and for the storage and handling of its materials.

1.20 COORDINATION

.1 The General Contractor shall coordinate all work and preparation on which subsequent work depends to facilitate mutual progress, and to prevent any conflict.

.2 The General Contractor shall ensure that each trade makes known, for the information of the General Contractor and other trades, the environmental and surface conditions required for the execution of its work; and that each trade makes known the sequence of others' work required for installation of its work.

.3 The General Contractor shall ensure that each trade, before commencing work, knows the requirements for subsequent work and that each trade is assisted in the execution of its preparatory work by trades whose work depends upon it.

.4 The General Contractor shall ensure that shop and layout drawings, templates, and all information necessary for the location and installation of materials, openings, inserts, anchors, accessories, fastenings, connections and access panels are provided by each trade whose work requires cooperative location and installation by other trades and that such information is communicated to the applicable installer.

.5 The General Contractor shall ensure that delivery of materials supplied by one trade to be installed by another is well before the installation begins.

.6 The General Contractor shall inform all trades that giving installation information in error, or too late to incorporate in the work, shall be responsible for any extra work caused thereby, unless impractical and where required, cutting shall be done by each respective trade, and patching shall be done by the general contractor.

1.21 ACCESS TO THE PROJECT

.1 The General Contractor for this Work shall, at all times allow the Consultants, the Owner, or any other Owner commissioned contractor or their employees, access into the building or around the premises, undisturbed, whether union or non-union, as may be required in the execution of other portions of the building work and installation of equipment, etc.

.2 The General Contractor shall cooperate fully with any and all Owner commissioned Contractors.

1.22 SUBTRADE AWARDS

.1 The Contractor shall, on notice of award of the contract, obtain the Consultants approval of a complete list of all persons or firms to which he proposes to sublet any part of the work, the trades or divisions of work which are to be sublet to each, and the amount of each trade. The General Contractor shall provide to the Consultant a financial breakdown

showing all divisions of the work amounting to the full sum of the contract. Mechanical and Electrical trades shall be further broken down as specified in Divisions 26 and 33.

1.23 SAFETY DATA SHEETS

.1 The General Contractor shall ensure that the following material and safety data sheets are submitted prior to commencing installation and application of at least the following:

- .1 Lead-free solder
- .2 Resilient flooring
- .3 Painting and finishing
- .4 Fertilizers
- .5 Glues and adhesives
- .6 Pesticides
- .7 Herbicides
- .8 Any other product which may give off air borne particles after installation.
- .9 Sealants and caulking

.2 The General Contractor and all of his Subcontractors must note that specifically, Asbestos and Asbestos containing materials solder for piping containing lead, and Painting & Coatings containing lead and/or mercury must be excluded from any part of the Work.

.3 Contractor The General must submit Certificates of Compliance, prior to the application for Substantial performance, for each of the following items:

- .1 An affidavit relative to the use of Lead-free solder for all domestic water lines, regardless of location.
- .2 Products for which Material Safety Data Sheets have been submitted and accepted.
- .3 Other Work/Products identified in the Contract Documents as requiring a Certificate of Compliance.

.4 Each Certificate of Compliance must indicate names and addresses of the project, the Owner, the date of Issue, produce description including name, number, manufacturer, with a statement verifying that the Work/Product installed meets specified requirements and, if applicable, complies with the submitted and accepted Material Safety Data Sheets.

.5 Each Certificate of Compliance must be issued on the trade's letterhead, properly executed, under whose work the respective Work/Product has been provided.

.6 Each Certificate of Compliance must be endorsed by the General Contractor with his authorized stamp/signature.

.7 The Completion Security Account will not be paid to the Contractor without submission of all required affidavits and requested material and safety data sheets.

1.24 REGULATING DOCUMENTS

.1 The General Contractor and all of his Subcontractors, Suppliers/Installers etc., must conform to the latest editions in force at the time of tender of each and all of the following: Ontario Building Code, Canadian Electrical Code (CEC), The Occupational Health and Safety Act, Ontario, the National Fire Code, the local Municipal Fire Code, and all other applicable Codes and Building By-Laws. All must also conform to the requirements of the Authorities Having Jurisdiction, such as Public Utilities. Where required under the Occupational Health and Safety Act, engage a Professional Engineer to design hoarding, scaffolding and shoring, formwork and falsework for concrete.

.2 Contract forms, codes, standards and manuals referred to in these specifications are the latest published editions at the date of close of tenders. The General Contractor and all of his Subcontractors, Suppliers/Installers must meet or exceed the requirements of specified standards.

.3 Provide, on site, copies of documents referred to in the Specification for joint use of Contractor and Consultant.

1.25 SITE SUPERINTENDENTS AND PROJECT MANAGERS

.1 It is the requirement under the work to this Contract that the Contractor provide on-site, full-time, *Site Superintendent* for the entire project duration through to the end of Deficiency completion. Superintendent shall have qualifications of previous experience with similar projects. Superintendent shall remain assigned full time to the project until completion of all deficiencies. This is a base bid requirement and the Contractor shall include this cost in the Tender Amount.

1.26 GENERAL CONTRACTOR'S RESPONSIBILITIES

.1 The list of General Contractor's responsibilities identified below is by no means comprehensive, nor is it in any priority or critical order. It is here, merely to identify the most often forgotten or ignored responsibilities of the General Contractor and is reproduced only as a reminder. The Consultants and the Owner advise the General Contractor that it is he who is responsible for all aspects and facets of the Project, from start to completion, from compliance with Occupational Health and Safety regulations to compliance with all codes and statutes.

.1 The General Contractor will be responsible to take all necessary steps to protect personnel (workers, visitors, general public, etc.) and property from any harm during the course of the contract.

.2 All equipment shall be in safe operating condition and appropriate to the task.

.3 Only competent personnel will be permitted on site. During the site introduction, *only the Consultant* will determine who is competent. The General Contractor will cause to remove from the site any persons not observing or complying with safety requirements.

.4 The General Contractor shall comply with, and shall ensure that all of his Subcontractors, Suppliers, Installers etc., comply with all Federal, Provincial and Municipal Safety Codes and Regulations and the Occupational Health and Safety Act.

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.5 The General Contractor shall supply competent personnel to implement his safety program and ensure that all Subcontractors comply with the Owner's standards, and those of the Occupational Health and Safety Act.

.6 The Owner will provide periodic monitoring to ensure that safety requirements are met, and that safety records are properly kept and maintained. Continued disregard for safety standards can cause the Contract to be canceled and the General Contractor removed from the site.

.7 The Owner may hire Commissioners to perform inspections of building systems at the closing stages of the work of this contract. If so contracted and identified in the *Instructions to Bidders*, the General Contractor shall cooperate with and coordinate the work of the Owner's Commissioners on site.

.8 The General Contractor will report to the Owner and Jurisdictional Authorities any accident or incident involving personnel and/or property of the Contractor, Owner, or Public, arising from the General Contractor's or any of his Subcontractors' execution of the work.

.9 The General Contractor will include all provisions of this contract in any agreement with Subcontractors, and hold them equally responsible for safe work performance.

.10 If the General Contractor is responsible for a delay in the progress of the work due to an infraction of legislation or Owner Health and Safety requirements, the Contractor will, without additional cost to the Owner, work such overtime, and acquire and use for the execution of the work such additional labour and equipment as to be necessary in the sole opinion of the Owner's Representative and Consultant, to avoid delay in the final completion of the work or any operations thereof.

1.27 MANUFACTURERS' INSTRUCTIONS

.1 Unless otherwise specified, the General Contractor and all his Subcontractors shall comply with manufacturer's latest printed instructions for materials and installation methods.

.2 The General Contractor shall notify the Consultant in writing of any conflict between the Specifications and Manufacturer's Instructions and have same clarified.

1.28 AIR AND VAPOUR SEAL

.1 The General Contractor shall ensure that exterior walls, windows, floor and roof surfaces provide an air-tight and vapour-tight membrane to prevent problems due to building vapour migration.

.2 In general, the air/vapour barrier must be achieved on the interior side of the thermal insulation.

1.29 FIRE SAFETY

.1 The General Contractor and all of his Subcontractors must comply with requirements of standard for Building Construction Operations FC No. 301-1982, issued by the Fire Commissioner of Canada.

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.2 The appropriate clauses of the Ontario Building Code relating to fire protection shall be strictly followed.

.3 The General Contractor shall provide and maintain free access to temporary or permanent fire hydrants acceptable to local fire department.

1.30 CONSTRUCTION SAFETY

.1 Refer also to *Section 01 35 23 – 'Site Safety Protocol for Occupied Buildings'*

.2 The General Contractor and all his trades must observe and enforce construction safety measures required by Canadian Construction Safety Code, Workplace Safety & Insurance Owner, and Municipal statutes. In particular, the Ontario Construction Safety Act, the regulations of the Ontario Department of Labour and Ontario Hydro Safety Requirements shall be strictly enforced. In event of conflict between any provisions of above authorities the most stringent provisions will apply.

.3 The General Contractor is reminded, once again, that it is he who is responsible for Occupational Health and Safety on this Project. The items listed below are only guidelines of the Owner's expectations in this regard and not to be construed to be comprehensive or total in nature.

.4 The Owner will take every reasonable precaution to prevent injury or illness to students, employees and the public, participating in Owner activities, or performing their duties. This shall be accomplished by providing and maintaining a safe, health working environment by providing the education necessary to perform these activities or duties safely.

.5 The Owner is vitally interested in the health and safety of all Contractors and their workers performing work for the Owner. Cooperation and support of the General Contractor in the protection of workers from injury or occupational disease is a major, continuing object of the Owner. To achieve these goals, the Owner, in concert with the Contractors, will endeavor to make every effort to ensure that the Contractors provide a work site which is a safe and healthy work environment. The Owner insists that all Contractors and their workers are dedicated to the continuing objective of reducing risk and injury.

.6 The General Contractor covenants and agrees to comply with all statutory and other obligations, including, without limitation, the provisions of the Occupational Health and Safety Act (Ontario) and all Regulations thereto, and all amending and successor legislation, including without limitation, Bill 208 (the "Act") in connection with all work performed by either the Contractor, Subcontractors, or any Other Contractor on, or in connection with, the Project.

.7 Without limiting the foregoing, for the purposes of this Contract, the General Contractor agrees that **he** shall be the "constructor" of the Project within the meaning of the Act, and as such, shall assume all the obligations and responsibilities, and observe all construction safety requirements and procedures, and duties of inspection imposed by the Act on the "constructor", as therein defined, for all work and services performed by the General Contractor, Subcontractors and Other Contractors on or in connection with the Project.

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.8 The General Contractor further covenants and agrees that the Owner and its existing and former officers, trustees, employees and agents, and their respective heirs, executors, administrators, successors and assigns (hereinafter collectively referred to as the "Owner") shall be released from any obligations or liabilities otherwise imposed on the Owner, or on any of them, pursuant to the Act in connection with the Project, and that the General Contractor shall assume all liability and responsibility in connection with same.

.9 The General Contractor agrees to save harmless and indemnify the Owner from any losses, damages, costs and expenses of any kind, or nature whatsoever, including all legal expenses, and all defense costs and related expert or consulting fees, incurred by the Owner, or any of them, arising in connection with the failure, default, or inability of the General Contractor of the Owner, or any of them, to comply with any of the aforementioned statutory, or other legal requirements, or arising in connection with any breach by the General Contractor of any of its covenants, agreements and obligations under this Contract.

.10 The General Contractor shall inform and instruct Other Contractors that they, while performing work on this project, are under the authority of the Contractor. Other Contractors are to discuss and co-ordinate with, and follow instructions from, the General Contractor on all matters of site access, vehicles, deliveries, storage, temporary facilities, coordination with the work of other subcontractors, work methods, scheduling, labour conditions, construction safety, environmental protection, security and all other matters which relate to the safe and proper execution of construction work.

.11 The General Contractor shall ensure that all supervisory personnel on job site are fully aware of the procedures and requirements outlined above and comply with all requirements specified.

.12 All Contractors are responsible to ensure that all machinery and/or equipment are/is safe and that the workers perform their tasks in compliance with established safe work practices or procedures. Workers must receive adequate training in their specific work tasks to protect their health and safety.

.13 The General Contractor shall be responsible for all persons and companies performing work, including Other Contractors, on this project, at all times, up to and including, the date of Substantial Performance of the Work. Authority for coordination and instructions relating to all matters which relate to the safe and proper execution of construction work shall rest with the General Contractor. The Contract Price must include the General Contractor's fees for the coordination and supervision of the work of all Other Contractors.

.14 In addition to the responsibility of all contractors as outlined above, Subcontractors will be held accountable for the health and safety of workers under their supervision.

.15 Every worker must protect his/her own health and safety by working in compliance with the law and with safe work practices and procedures established by the authorities having jurisdiction.

.16 All sections of the Occupational Health and Safety Act for Industrial Establishments, latest edition, and the Occupational Health and Safety Act for Construction projects, latest

edition, shall be enforced, by the General Contractor, in their entirety, throughout the duration of the construction project.

.17 The General Contractor shall provide the Consultant with the telephone number where the General Contractor or his representative can be reached at any time, day or night, for the duration of the contract.

.18 Where an accident, explosion, or fire causes a person injury at the work place, and the worker is disabled from performing the usual task, the General Contractor shall prepare a written notice and shall forward same to the Ministry of Labour within four days of the occurrence with a copy to the Owner's Representative, who shall copy and inform the Owner's Supervisor of Health and Safety and/or the Owner's Joint Health and Safety Committee, containing such information and particulars as may be described.

.19 Where a person is killed or critically injured from any cause at the work place, the General Contractor shall immediately call the Ministry of Labour. A written notice from the General Contractor shall be given to the Ministry of Labour within forty-eight hours after the occurrence, containing such information and particulars as may be prescribed, with copies to the Architect and the Owner's Representative.

.20 The General Contractor is advised that the accident scene is under the jurisdiction of the Ministry of Labour and no wreckage, articles, etc., shall be interfered with, disturbed, destroyed, altered or carried away at the scene, or connected with the occurrence, until the Ministry of Labour has given permission.

1.31 INDEPENDENT TESTS AND INSPECTIONS

.1 The Contractor shall appoint inspection firms as directed by the Consultant and make payments from the cash allowances specified in Division noted, except for the following, which shall be included in the contract:

- .1 Inspection and testing required by laws, ordinances, rules, regulations or orders of public authorities.
- .2 Inspection and testing performed exclusively for Contractor's convenience.
- .3 Testing, adjustment and balancing of mechanical and electrical equipment and systems.
- .4 Mill tests and certificates of compliance.
- .5 Re-testing as already described in *Quality Control* of this Section.

.2 The Consultant will authorize payment of inspection services from specified cash allowances.

.3 The General Contractor shall furnish labour and facilities to:

- .1 Provide access to work to be inspected and tested.
- .2 Facilitate inspections and tests.
- .3 Make good work disturbed by inspection and test.
- .4 Pour concrete test cylinders and store as directed by Inspection Firm.

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.4 The General Contractor shall notify Inspection Firms sufficiently in advance of operations to allow for assignment of laboratory personnel and scheduling of test.

.5 Where materials are specified to be tested, the General Contractor shall deliver representative samples in required quantity to testing laboratory.

1.32 PERIODIC CLEANING

.1 Refer also to Section 01 74 11.

.2 As part of the Tender, the General Contractor shall provide all necessary garbage bins through the duration of the project. The General Contractor shall ensure that the following is accomplished:

.1 Keep all areas of the Work clean and orderly, free from accumulation of dirt, debris, garbage, oily rags, excess material, or such other trash items. Remove such items for all areas of the Work on a daily basis.

.2 Vacuum and/or broom interior building areas when ready to receive painting and other finishes. Continue cleaning on an "as needed" basis until the building is ready for inspection and takeover.

.3 Schedule cleaning operations so that resulting dust and other contaminants do not affect wet, newly painted surfaces.

.4 In preparation for Substantial Performance and Occupancy, conduct inspections of all exposed interior and exterior surfaces.

.5 Remove grease, dust, dirt, stains, labels, fingerprints, and other foreign materials from all exposed interior and exterior finishes, including glass and other polished surfaces.

.6 Remove all protective film from switch plates and hardware, particular kick plates.

.7 Clean lighting reflectors, lenses and other lighting surfaces.

.8 Broom clean paved surfaces and rake clean other disturbed surfaces in the area of the Work, to remove site debris caused by the Work of this Contract. Inspect for damages and make good.

.9 Remove debris and surplus materials from the roof areas and accessible concealed spaces.

.10 Replace heating, ventilation and/or air conditioning filters through the entire building to the extent that they supply or return from the work areas, whether or not, the units were operated during construction operations.

.11 Refer to "cleaning" sections of the specifications for additional specific periodic and final clean up requirements.

.3 The General Contractor must note the Owner insists that tiled (VCT) and sheet good floors (vinyl or linoleum) be broom swept only. Wet mopping and waxing/polishing will be done by the Owner's Caretaking Staff.

.4 Do not provide sealants and waxes on terrazzo, ceramic and other hard surfaced floors without reviewing products and methods of application with the Owner's Caretaking

Staff. Failure to comply with this requirement will result in the contractor stripping these floors in their entirety.

.5 The contractor shall also ensure that the appropriate measures including a stone mud mat are installed and maintained at all construction entrances, to avoid contamination of City roads and sewers. It is the Contractor's responsibility and not the Owner's to ensure that site entrances and roadways in front of the site are maintained in clean condition acceptable to the municipality or Subdivision Engineer, as the case may be for un-assumed subdivisions.

1.33 TEMPORARY PROTECTION

.1 Refer also to Articles 1.8, in this Section.

.2 The General Contractor to provide temporary dustproof and fire resistant barricades, screens or barriers to separate all work areas from other parts of the building and/or as directed by the Consultant and/or authorized Owner Representative, for the safety of persons, or for dividing the Work from portion or portions of the building or site that may be required for use by the school, or others.

.3 Properly protect the Work from any damage by the elements. In cold weather cover all exterior openings in the work areas likely to cause water damage.

.4 During off hours and/or stages of suspended operations for whatever reasons, the General Contractor must assume all responsibility for protection against the elements, theft and/or vandalism. This applies to all work in progress and to any materials, products, tools, equipment, or other such items left at the work site.

.5 Properly protect floors and roofs from any damage. Take special precautions when moving heavy loads or equipment over floors and roofs.

.6 The General Contractor must keep floors free of oils, grease or other such materials likely to discolour them and/or affect bonding of applied surfaces.

.7 The General Contractor must ensure that no part of the Work is loaded greater than it was designed for, when completed. Make any temporary support as strong as the permanent support. Place no load on concrete structure until it has sufficient strength to safely bear such load.

.8 Protect glass and other finishes against heat, slab and weld splatters, using appropriate protective shields and covers.

.9 The General Contractor must provide and maintain, in good working order, appropriately labeled ULC fire extinguishers, to the approval of Authorities Having Jurisdiction.

.10 The General Contractor must provide a minimum of two safety helmets on site at all times for the use of the Consultant and any other Owner authorized visitors to the site. It is the General Contractor's responsibility to make certain that any such visitors wear the protective headgear and any other safety gear which may be necessary at that particular time of construction.

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1.34 COMPLETION

.1 Upon completion of the Work, all protection erected shall be removed, all damage to the Work and adjoining Work due to the lack or failure of such protection shall be made good and all debris, surplus materials tools equipment shall be removed from the work areas and the site, and the Project shall be left clean and tidy to the full and complete satisfaction of the Consultant and Owner Staff. The General Contractor shall give written notice to the Consultant, requesting final inspection of the completed Project.

.2 Refer to the pertinent sections of the Specifications for requirements with respect to submission of *Record Documents, Maintenance Materials, Special Tools* and *Spare Parts.*

1.35 GUARANTEES

.1 The following is a summary of the guarantees (in number of years) required by the contract. Refer to individual specifications sections for additional information on warrantees. In the event an extended warranty is listed in the specific Section, that section will have precedence over this list. If no extended warranty is listed, this list will govern:

.1	Entire Building, General Contract	1
.2	Paving	2
.3	Finish Carpentry	2
.4	Sprayed-In-Place Urethane Insulation	2
.5	Precast Structural Concrete	5
.6	Caulking	2
.7	Aluminum Composite Metal Panels	5
.8	Aluminum Windows & Window Walls (manufacturer's)	5
.9	Glazed Sealed Units	10
.10	Finish Hardware	3
.11	Panic Devices and Door Closers	5
.12	Acoustic Ceilings	2
.13	Built Up Roofing (installation)	2
.14	Built Up Roofing (manufacturer's)	10
.15	Sheet Metal Flashing and Siding	5
.16	Concrete Floors	3
.17	Ceramic Tile	5
.18	Millwork	2
.19	Painting (OPCA warranty)	2
.20	Resilient Tile	3

.2 The guarantee period shall start on the date of issue of the Certificate of Substantial Performance of the Contract by the Consultant.

1.36 CONTINGENCY ALLOWANCE

.1 Refer to the front-end specifications (RFT) for allowance requirements.

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1.37 CASH ALLOWANCES

.1 Include in the Contract Price, a Cash Allowance in the amount of **Seven hundred thousand dollars, ($700,000.00) not including HST.**

.2 Cash Allowances, unless otherwise specified, cover the net cost to the General Contractor of services, products, construction, machinery and equipment, freight, handling, unloading, storage installation and other authorized expenses incurred in performing the Work.

.3 The Contract Price, *and not the Cash Allowance*, includes the General Contractor's profit and coordination costs in connection with all Cash Allowance expenditures.

.4 The Contract Price will be adjusted by written order by the Consultant to provide for an excess or deficit to each Cash Allowance. Any unused portions of these allowances shall be returned to the Owner on the conclusion of the Contract.

.5 A schedule shall be prepared jointly by the Consultant and the General Contractor to show when items called for under Cash Allowances, so that the progress of the Work is not delayed.

.6 Exclusive of Deposits, which are the contractor's sole responsibility to provide as required of Authorities Having Jurisdiction, the following is a summary of the scope Cash Allowances to be included in the contract:

.7 Expend both Cash Allowances as directed by the Consultant in writing. Allowances will be adjusted to actual cost with no adjustment to Contractor's charges. Cash expenditure must identify the H.S.T. separately.

.9 Cash Allowance Breakdown of Items

- .1 Testing and Inspections (requested by Consultant, Owner or imposed by Authorities)
- .2 Exterior building signage (wall mounted school name, address and HCDSB logo supply and install).
- .3 Interior signage (supply and install)
- .4 Unidentified Computer Components (only components that may be required on site that have not specified in specification Binder B)
- .5 Outdoor recreational equipment and play area line painting
- .6 Hydro Service Connection Fees
- .7 Telephone, PA and Clock System
- .8 Lighting controls & equipment. (Installation and connections are to be included in the electrical contractors Bid Price)
- .9 Security System
- .10 Gym sound system
- .11 Local Communications Service Provider
- .12 Incoming Gas Service
- .13 Incoming fibre optic/cable service by Utility Company

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.14 Temporary Site Construction Sign (if required)

.15 Completion Site Survey by OLS

.16 Preparation of digital as-built drawings

1.38 ALLOWANCES CARRIED IN DIVISIONS 15 AND 16

.1 Refer to Divisions 15 and 16 for any additional Cash Allowances to be carried by the Sub-Contractor.

1.39 SCHEDULE OF ALLOWANCES

.1 Material Allowances shall include the following:

.1 Net cost of Material

.2 Applicable taxes and duties

.3 Delivery to site

.2 For Material Allowance, the contract shall include:

.1 Handling at site, including unloading, uncrating, storage and hoisting

.2 Protection from elements, from damage

.3 Labour, installation and finishing

.4 Other expenses required to do cash allowance work (i.e. contract co-ordination)

.5 Overhead and profit

.3 Material and Installation Allowances shall include the following:

.1 Net cost of material

.2 Applicable taxes and duties

.3 Deliver to site

.4 Handling at site, including unloading, uncrating, storage and hoisting

.5 Labour, installation and finishing

1.40 POLYCHLORINATED BIPHENYL (PCB)

.1 Conform to the Environmental Protection Act and Regulations, Ontario Regulation 11/82 as amended.

1.41 USE OF CONSULTANTS'S DIGITAL DRAWINGS

.1 Where a contractor wishes to obtain a digital copy of consultant drawings for shop drawings or survey purposes, the consultant may elect to provide this drawing for a nominal fee. As this is the consultants' option, the contractor shall not anticipate provision of these digital drawings to meet the contract schedule.

1.42 BUILDING DIMENSIONS

.1 Ensure that all necessary job dimensions are taken and all trades are co-coordinated for the proper execution of the work. Assume complete responsibility for the accuracy and completeness of such dimensions, and for co-ordination.

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.2 Verify that all work, as it proceeds, is executed in accordance with dimensions and positions indicated which maintain levels and clearances to adjacent work, as set out by requirements of the drawings, and ensure that work installed in error is rectified before construction resumes.

.3 Check and verify all dimensions referring to the work and the interfacing of all services. Verify all dimensions, with the trade concerned when pertaining to the work of other trades. Be responsible to see that Subcontractors for various trades co-operate for the proper performance of the Work.

.4 Avoid scaling directly from the drawings. If there is ambiguity or lack of information, immediately inform the Consultant. Be responsible for any change through the disregarding of this clause.

.5 All details and measurements of any work which is to fit or to conform with work installed shall be taken at the building.

.6 Advise Consultant of discrepancies and if there are omissions on drawings, including layout of items which affect aesthetics, or which interfere with services, equipment or surfaces. DO NOT PROCEED without direction from the Consultant.

.7 Prepare interference drawings AND SUBMIT AS SHOP DRAWINGS IN ADVANCE OF PRODUCTION to properly co-ordinate the work in all ceiling spaces and where necessary. Coordinate these drawings with all Divisions. Refer also to Section 013300.

1.43 SETTING OF WORK AND REQUIRED SURVEYS

.1 As part of the base tender amount, provide and pay for the services of a Land Surveyor acceptable to the Consultant, registered in the Province of Ontario to establish the property boundaries and the location of the site alternations.

.2 Lay out building lines for the work and provide substantial stakes or monuments to preserve lines and levels.

.3 Verify on the site all grades, lines, levels, dimensions and location of hydrants, existing structures, manholes, overhead and buried utilities, existing trees, roadways, sidewalks and the like, shown on the drawings, and report omissions, errors, or inconsistencies, before commencing work.

.4 Upon completion of layout work and before commencement of any excavation, give ample notification to allow for inspection of lines and levels. Such inspection does not in any way mitigate the Contractor's responsibility for accuracy of layout.

.5 Provide the consultant with a Surveyor’s Certificate describing the location of all perimeter foundation walls relative to property lines before construction proceeds on those walls.

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1.44 LAYOUT OF WORK

.1 Layout work with respect to the work of all trades. Arrange mechanical and electrical work such as piping, ducts, conduits, panels, equipment and the like to suit the architectural and structural details.

.2 Alterations necessary due to conflict and interference between trades, to be executed at no cost to the Owner unless notification is given in writing before Tender Closing Date.

1.45 DOCUMENTS REQUIRED AT START, DURING & CLOSE-OUT OF CONSTRUCTION

.1 At Commencement of Contract

.1 Supply Performance Bond and Labour and Material Bond, in accordance with Section 00 21 13, Instructions to Bidders.

.2 Supply Public Liability and Property Damage Insurance Certificates, also Builder's Risk and Boiler Insurance as required of the Contract.

.3 Supply Certificates of good standing from WSIB for the General Contractor and all Subcontractors.

.4 Supply a complete Contract Sum Breakdown of all subtrades or parts of work and general expense items for approval by all consultants. Include Mechanical and Electrical Breakdowns for review and acceptance by Consultants.

.5 Supply a competent detailed Construction Schedule that has been reviewed and approved by major subtrades. Identify critical milestone dates for Addition, Renovations and Sitework.

.6 Supply Cash Flow schedule of monthly progress payments in coordination with the Construction Schedule and plot as 'S' curve chart.

.7 Supply Schedule of Shop Drawing Submissions and identify list of long-lead items.

.8 Apply for and post and supply a copy of Notice of Project.

.9 Supply a copy of Health & Safety policy as well as post at the job site.

.10 Supply Shoring Designs of all load bearing areas if any required of the construction sequence or if required by the Structural Engineer.

.11 Supply interference drawings for all areas requested by the Architect, Mechanical Engineer or Electrical Engineer.

.2 During Construction

.1 Maintain as-built record drawings in clean condition.

.2 Organize regular Trade Coordination meetings.

.3 Organize separate, regular Owner and Consultant Job Meetings in accordance with Section 012200.

.4 Maintain a copy of up to date records on site including, but not limited to Permit Sets, Contract Documents updated with all addenda, all Changes and Supplementary Instructions issued by Consultants.

.3 Monthly with Each Progress Payment Application

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.1 Supply Monthly Progress Reports and Construction Schedule in accordance with Section 012200.

.2 Adjust Allowances, as required.

.3 Current WSIB Form

.4 Confirm that payments are being made to subcontractors and suppliers by submission of original copies of the current versions of Statutory Declarations with the second and subsequent Progress Payment Application. Include both Statutory Declarations Form CCDC-9A for the General Contractor and CCDC-9B from subcontractors with each monthly Progress Payment Application. No payment will be made for unincorporated material on the site, unless Bill of Sale in proper format is provided.

.4 Prior to Substantial Completion

.1 Provide detailed Completion Schedule a minimum of 90 days prior to Substantial Completion. Schedule to illustrate all trades and sequences required for completion and legal occupancy. Issue to Consultants and upon acceptance, to all trades.

.2 Coordinate Completion Schedule with Building Commissioner at least 60 days prior to substantial completion or as directed by Consultant.

.3 Prior and as a requirement of owner acceptance of Substantial Completion of the work the following to be observed, executed and submitted:

.1 DEFICIENCIES ARE LISTED: prior to Substantial Completion, the contractor shall prepare a room by room deficiency list in electronic format on an MS Excel spreadsheet provided by the Consultant. Contractor shall print and review on site with consultants at a site meeting and post on each room or area. Contractor shall reissue back to Consultant, when updated, in Excel electronic format. This list will be acted upon by all trades and coordinated and updated weekly as a minimum by the General Contractor to ensure all deficiencies are addressed by the date required for Total Performance. Confirm in writing to the Architect when and on what dates each deficiency has been completed in a satisfactory manner. The Consultant's site review will be final approval.

.2 Acceptable preliminary submissions of all Mechanical and Electrical Operations and Maintenance Manuals have been reviewed by Consultants.

.3 Acceptable preliminary submissions of all Warranty and Shop Drawing Records have been reviewed by Consultants.

.4 All final clean-up to have been executed, as specified in Section 01 74 11.

.5 Complete preliminary balancing and provide preliminary Balancing Reports.

.4 Failure to comply with these requirements shall have amounts withheld on Progress Payments and delay issuance of Certificate of Substantial Completion.

.5 Note that Prior to the Release of Holdback, a similar Progress Claim is required, and must include current Statutory Declaration Forms CCDC-9A for the General Contractor and CCDC-9B from subcontractors updated to refer to the Previous Certificate of Payment.

.5 Upon Completion (Refer also to 01 78 00 Close-Out Submittals)

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.1 Upon completion of work before the Final Certificate of Payment is issued, the following to be observed, executed and submitted:

.2 DEFICIENCIES ARE COMPLETE. Confirm in writing to the Architect when and on what dates each deficiency has been completed in a satisfactory manner. The Consultant’s site review will be final approval.

.3 Finishing Hardware, Inspection and Verification. Note requirements for qualified installation and inspection in Section 08 71 10- Door Hardware. Inspection only is paid for from Cash Allowances.

.4 Organize a Final Inspection tour at which to be present: the Owner's authorized representative; the Architectural, Structural, Mechanical and Electrical Consultants, and their supervisory personnel, if any; the Contractor and his superintendent.

.5 Where the above procedure is impossible or where any deficiencies remain outstanding, the Owner's representative and the Consultant concerned, to inspect and accept the affected work and/or material upon notification by the Contractor, that all deficiencies involving this Consultant have been made good.

.6 A complete release of all liens arising out of this Contract, other than his own. If a subcontractor or supplier refuses to furnish a release of such a lien, furnish a bond satisfactory to the Owner to indemnify him against any claim under such a lien.

.7 Certificates of good standing from the WSIB, for the General Contractor and all Subcontractors.

.8 All reference records, as specified, under Section 01 78 00.

.9 Certificate of Inspection from Mechanical and Electrical Engineers.

.10 Copies of all Lists of Deficiencies with each Deficiency verified when complete by only this project's job Superintendent. The Final List of Deficiencies to be signed, completed by all concerned, if accepted.

.11 Statement of Completion from General Contractor.

.12 Final adjustment of all Allowances.

.13 Certificates required by Provincial, Municipal and other authorities having jurisdiction. Including signed Building Permit.

.14 Final Balancing Reports showing completed adjustments

.15 1 set of marked up prints of complete Architectural, Structural, Mechanical and Electrical drawings in addition to the digital copies required below.

.16 Digital copy of Site Services, Architectural, Structural, Mechanical and Electrical and 2 sets As-Built Drawings – paid from Cash Allowance.

.17 As-Built Survey by O.L.S. (.PDF & .DWG format) – paid from Cash Allowance. Survey to include detailed spot elevations and include elevations at tops of all CB's & MH's, all invert elevations (engage private locate firm as required), elevations at bottoms of curbs, elevations at all corners of building.

.18 Final digital PDF of all Maintenance Manuals.

Part 2 Products

2.1 NOT USED

.1 Not used.

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Part 3 Execution

3.1 NOT USED

.1 Not used.

END OF SECTION

□

Part 1 General

1.0 ONTARIO AND CANADIAN GOODS AND SERVICES

.1 It is the intent of this project design, tender and construction to comply with the 'Buy Ontario Procurement Directive'. The objective is to maximize the use of Ontario-Made and Canadian-Made Goods and Ontario Services, while maintaining value for money and the timely delivery of infrastructure projects. This includes construction, fixtures, furniture and equipment that are included in and incidental to this construction project, and as required to support the school's operational readiness immediately following completion of construction.

.2 Efforts have been made to specify Ontario and Canadian made goods in the drawings and specifications. In instances where goods and services have been specified that are not Ontario or Canadian made, if there are alternates that are Ontario and Canadian produced, meet the performance of the specified items and that are available within the project construction schedule, they will be allowed to be supplied as part of this project upon review and approval by the consulting team.

.3 As the School Board is governed under, and considered to be a Broader Public Sector (BPS) entity, they are required by the 'Buy Ontario Procurement Directive' to exclude U.S. businesses from procurements, however, procuring from U.S. businesses is allowed if any of the following circumstances apply:

- .1 A U.S. business is the only viable source for the good/service, and the procurement cannot be delayed.
- .2 For procurements for services, the U.S. business commits to having at least 90 percent of the required staff to deliver the contracted services located in Canada.
- .4 For any goods or services from a U.S. business, regardless of the value, approval must be obtained from the appropriate governing entity to procure.

.4 To understand the procedure, forms and information required for approval of any goods or services, visit https://www.ontario.ca/page/buy-ontario-procurement-directive.

1.1 DOMESTIC SUPPLY CHAIN PLAN (DSCP) – DECLARATION OF GOODS & SERVICES

.1 A Domestic Supply Chain Plan (DSCP) will be formed by the consultant from the information provided by contractors in the 'Stipulated Price Subcontract Bid' forms submitted at the time of tender, in compliance with the requirements of the *Buy Ontario Procurement Directive,* which outlines the origin and sourcing strategy for major goods and services required for the construction of the proposed work.

Contractors shall not substitute goods or services with those that do not comply with the Buy Ontario Act. Any substitutions shall be subject to the Consultants' and Board's approval.

.2 Objectives: Maximize procurement of goods manufactured in Ontario and Canada

- .1 Support local and regional suppliers, trades, and workforce.
- .2 Ensure transparency in sourcing of major construction materials and services.
- .3 Provide traceability and documentation to demonstrate compliance.

.3 Definitions:

.1 Ontario Supplier: A business with a physical presence in Ontario that manufactures, assembles, or distributes goods, or provides services.

.2 Domestic Content: Goods that are manufactured or substantially transformed within Ontario or Canada.

.3 Ontario-Sourced: Goods manufactured or substantially transformed in Ontario.

.4 Canadian-Sourced: Goods manufactured or substantially transformed in Canada.

.5 Non-Domestic: Goods sourced outside Canada.

.6 Major goods: means durable materials, systems or components that are essential to ensuring the operational readiness or performance of the deliverable, and include:

.1 Structural materials: concrete, steel and other metals, lumber, stone, aggregates;

.2 Building envelope components: windows, glass, roofing systems, bricks;

.3 Mechanical and electrical systems: HVAC units, generators, elevators;

.4 Specialty items: prefabricated panels, major fixtures;

.5 Fixtures, furniture and equipment; and,

.6 Transit fleet vehicles.

.7 Ontario Service: A service wholly provided by individuals (natural persons) located in Ontario

.8 Ontario-Made Good: A good that meets any one of the following criteria:

.1 It is wholly manufactured or originating in Ontario, or

.2 At least 51% of the total direct costs of producing or manufacturing the good have been incurred in Ontario.

.9 Canadian-Made Good: A good that meets any one of the following criteria:

.1 Is wholly manufactured or originating in Canada,

.2 At least 51% of the total direct costs of producing or manufacturing the good have been incurred in Canada, or

.3 Is labelled as “Made in Canada” or “Product of Canada”.

.10 Canadian Service: A service wholly provided by individuals (natural persons) located in Canada.

1.2 SUPPLY CHAIN STRATEGY

.1 Contractors and Subcontractors must:

.1 Prioritize Ontario-based suppliers and subcontractors.

.2 Engaging local labour and trades wherever possible.

.3 Ensuring transparency in sourcing decisions.

.4 Maintaining documentation to verify origin of goods and services.

.5 Mitigating supply chain risks through diversified domestic sourcing.

.6 Identify specified materials that do not comply with the directive and provide alternates that meet the requirements of the specification and mandate within the tender/contract price, where required.

.2 Contractors, Subcontractor and Vendor Engagement:

.1 All subcontractors will be required to provide the following during construction:

.1 Disclose the origin of major goods, materials and components.

.2 Demonstrate efforts to source from Ontario suppliers.

.3 Provide supporting documentation upon request.

.3 Monitoring and Reporting

.1 The General Contractor commits to:

.1 Track the origin of the goods and services (Ontario, Canadian or Non-Domestic) throughout the project.

.2 Provide reports to the Owner in compliance with the Directive (with monthly progress billing) including:

.1 Confirmation that actual suppliers used match those identified in the DSCP.

.2 Any deviations from the DSCP are documented with justification.

.3 Supplier certifications with Province/Country-of-origin declarations.

.3 Notify the Owner in advance of any material changes to supply sources, especially where:

.1 A domestic supplier is replaced with a non-domestic supplier (subject to the approval of the Owner where needed).

.2 Availability or cost issues impact compliance.

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 PROJECT DESCRIPTION

.1 Work of the Contractor package and several separate Subcontract packages to be performed under a single Cost Plus Contract comprises the Project, Construction of the:

NORTH OAKVILLE #3 CATHOLIC ELEMENTARY SCHOOL
3500 Post Road
Oakville, Ontario
and further identified as Project No.: 24106

1.2 CONTRACT DOCUMENTS

.1 Refer to CCDC 3, GC 1.1 and CCA 1, SCC 1.1.

.2 The Contract Documents were prepared by the Consultant for the account of the Owner. The material contained herein reflects the Consultant's best judgement in light of the information available to him at the time of preparation. Any use which a third party makes of the Contract Documents, or any reliance on or decisions to be made based on them, are the responsibility of such third parties. The Consultant accepts no responsibility for damages, if any, suffered by any third party as a result of decisions made or actions based on the Contract Documents.

.3 These specifications are written in imperative mood in an abbreviated form. The imperative language of the technical sections is directed to the Contractor, unless specifically noted otherwise. Incomplete sentences shall be completed by inserting "shall", "the Contractor shall", and "shall be", and similar mandatory phrases by inference in the same manner as they are applied to notes on the drawings. The words "shall be" will be supplied by inference where a colon (:) is used within sentences and phrases. Except where worded to the contrary, fulfill and perform all indicated requirements whether stated imperatively or otherwise.

1.3 CONTRACT METHOD

.1 Single Construction Contract: The Contractor shall construct the Work under a CCDC 3, Cost Plus contract.

.2 Throughout the execution of the Project, the Consultant may bid portions of the Project and nominate Subcontractors, whose parts or portions of the Project will be incorporated as part of this Contract to make up the Work.

.3 The Consultant will prepare stipulated price CCA 1 Subcontracts for execution between the Contractor and the Subcontractors.

.4 Refer to the Supplementary Conditions and Supplementary Subcontract Conditions for information pertaining to the contractual relationship between the Contractor and the Subcontractors.

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.5 Sections listed as part of a particular Subcontract package may include work described under other Sections. When referenced as a Related Section, include such portions of the Work as part of that particular Subcontract.

1.4 ADMINISTRATIVE / PROCEDURAL SECTIONS APPLICABLE TO ALL CONTRACTS AND SUBCONTRACTS

01 11 00 Summary of Work
01 12 00 Multiple Contract Summary
01 22 00 Meetings and Progress Reports
01 33 00 Submittal Procedures
01 35 23 Site Safety Protocol for Occupied Buildings
01 35 30 Health and Safety Requirements
01 35 43 Environmental Procedures
01 45 00 Quality Control
01 73 03 Execution Requirements
01 74 11 Cleaning
01 77 00 Closeout Procedures
01 78 00 Closeout Submittals
01 78 10 Sample Guarantee/Warranty form
01 90 00 Integrated System Testing of Fire protection and Life Safety Systems
01 91 00 Building Envelope Quality Control

1.5 TEMPORARY UTILITIES, FACILITIES AND SERVICES

.1 Subcontract SC01: Refer to Section 01 50 00 - Temporary Facilities and Controls.

.2 Each Subcontractor shall Provide and perform the following:

.1 Electrical extension cords from distribution sources, work lights and any special power required for Subcontract Work.

.2 Separate telephone service required for Subcontract Work.

.3 Water hoses required for Subcontract Work.

.4 Field offices and sheds required for Subcontract Work.

.5 Cleaning of Subcontract Work; delivery of debris to collection.

1.6 CONTRACT No. Project No.: 24106-C00 - CONTRACTOR

.1 Assume total control of the Works of the Project. Be responsible for coordination, sequencing and scheduling of work of all Contracts, ensure conformity with the Contract Documents. Refer also to section 01 31 00 Project Management and Coordination.

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.2 Assume sole responsibility for construction means; methods, techniques, sequences and procedures, including site usage; provision of temporary utilities, facilities and services; quality control and coordination of testing and inspection services; and, site administration.

.3 Fulfill the role of the "constructor" as defined in the Ontario Occupational Health and Safety Act (Construction Projects). File the required Notice of Project and carry out and enforce the provisions in the Act and the requirements of the Project Health and Safety Policy.

.4 Report directly to the Consultant.

.5 Conduct site management duties for the duration of the Project, including field engineering services necessary to layout the Project and ensure accurate working lines and levels for Subcontract Work. Refer to Section 01 71 00.

.6 Appoint a single supervisor for the duration of the Contract, until completion of the Contract. Refer to GC 3.6 - Supervisor.

.7 Arrange for a minimum of one labourer to be present on site each Working Day until completion of the Contract.

.8 Arrange and pay for the publication of the Project's Certificate of Substantial Performance of the Work.

.9 Monitor site cleanliness on a daily basis and ensure conformance to the requirements of authorities having jurisdiction with respect to waste audits and waste reduction work plans. Provide waste containers on site and arrange for periodic waste removal as necessary until completion of the Contract.

.10 Contract C00 is to include the Cash Allowance amount outlined in Section 01 11 00 Summary of Work, item 1.37.

1.7 SUBCONTRACT No. Project No.: 24106-SC01 – GENERAL

.1 Report directly to the Contractor on all matters pertaining to the execution of the Work.

.2 Maintain site cleanliness on a daily basis as it applies to the work of this Subcontract and ensure conformance to the requirements of authorities having jurisdiction with respect to waste audits and waste reduction work plans.

.3 Perform final cleaning of the Project as specified in Section 01 74 00.

.4 Sections listed as part of a particular Subcontract package may include work described under other Sections. When referenced as a Related Section, include such portions of the Work as part of that particular Subcontract.

.5 Include the following Work as part of Subcontract Project No.: 24106-SC01:

.6 Division 00

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.1 00 52 11 - Subcontract Agreement
.2 00 71 11 - Subcontracting Definitions
.3 00 72 11 - Subcontract Conditions
.4 00 73 11 - Supplementary Subcontract Conditions

.7 Division 01 - General Requirements
.1 Administrative / procedural sections applicable to all contracts as listed above.
.2 Provide and pay for those items listed above in the temporary utilities, facilities and services as required for the Subcontract Work.
.3 01 51 00 - Temporary Utilities (excluding temporary heat for masonry)
.4 01 52 00 - Construction Facilities
.5 01 56 00 - Temporary Barriers and Enclosures

.9 Division 03 - Concrete
.1 03 10 00 – Concrete Formwork and Accessories
.2 03 20 00 – Concrete Reinforcement
.3 03 30 00 - Cast in Place Concrete (building components)
.4 03 35 05 - Concrete Floor Hardeners

.10 Division 05 - Metals
.1 05 50 00 - Metal Fabrications

.11 Division 06 - Wood, Plastics and Composites
.1 06 10 11 - Rough Carpentry (including roof blocking and curbs)
.2 06 47 00 - Plastic Laminates (for Flush Wood Doors only. Remainder of laminate to be under 06 40 00 Architectural Millwork)
.3 06 18 00 Glue-Laminated Structural Units

.12 Division 07 - Thermal and Moisture Protection
.1 07 11 13 - Bituminous Waterproofing
.2 07 21 13 - Board Insulation (in areas other than wall cavity included in the Masonry scope)
.3 07 21 19 - Foamed-In-Place Insulation (in areas other than wall cavity included in the Masonry scope)
.4 07 27 10 - Air Barriers (in areas other than locations related to masonry scope)
.5 07 81 00 - Applied Fireproofing
.6 07 84 00 - Fire Stopping
.7 07 92 00 - Joint Sealers
All wood blocking at the expansion joint walls & perimeter at parapets
Supply & installation of mineral fibre batt within expansion joints, parapets and walls

.13 Division 08 - Openings
.1 08 11 14 - Metal Doors and Frames (supply only)
.2 08 11 15 - Door Schedule
.3 08 14 10 - Flush Wood Doors
.4 08 80 50 - Glazing (mirrors only)
.5 08 92 00 – Louvres

.14 Division 10 - Specialties
.1 10 11 25 - Manufactured Specialties
.2 10 14 10 – Site Signage
.3 10 28 10 - Washroom Accessories
.4 10 44 00 – Concrete Storage Unit

.15 Division 12 - Furnishings
.1 12 21 16 - Window Coverings
.2 12 21 18 - Stage Drapery

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.16 Division 13 – Special Construction
- .1 13 05 41 Seismic Restraint Requirements for Non-Structural Components (coordination of mechanical and electrical items)

.17 Division 31 - Earthwork
- .1 31 14 10 - Site Preparation
- .2 31 23 10 - Excavating, Trenching and Backfilling (excluding subgrade granulars for 32 12 17 - Asphalt Paving and 32 13 13 - Concrete Paving)
- .3 31 23 13 - Rough Grading
- .4 31 25 00 – Erosion and Sedimentation Control

.18 Division 33 - Utilities
- .1 33 05 14 - Manholes and Catch Basin
- .2 33 11 17 - Water Systems
- .3 33 31 13 - Sanitary Sewers
- .4 33 44 00 - Storm Sewers
- .5 33 46 00 - Subdrainage
- .6 33 46 20 - Foundation and Underslab Drainage

1.8 SUBCONTRACT No. Project No.: 24106-SC02 - MASONRY

.1 Report directly to the Contractor on all matters pertaining to the execution of the Work.

.2 Maintain site cleanliness on a daily basis as it applies to the work of this Subcontract and ensure conformance to the requirements of authorities having jurisdiction with respect to waste audits and waste reduction work plans.

.3 Sections listed as part of a particular Subcontract package may include work described under other Sections. When referenced as a Related Section, include such portions of the Work as part of that particular Subcontract.

.4 Include the following Work as part of Subcontract Project No.: 24106-SC02:

.1 Division 00
- .1 00 52 11 - Subcontract Agreement
- .2 00 71 11 - Subcontracting Definitions
- .3 00 72 11 - Subcontract Conditions
- .4 00 73 11 - Supplementary Subcontract Conditions.

.2 Division 01 - General Requirements
- .1 Administrative / procedural sections applicable to all contracts as listed above.
- .2 Provide and pay for those items listed above in the temporary utilities, facilities and services as required for the Subcontract Work.
- .3 01 51 00 - Temporary Utilities (temporary heat for masonry only).

.3 Division 4 - Masonry
- .1 04 21 13 - Masonry Veneer
- .2 04 22 01 - Structural Load Bearing CMU Construction

.4 Division 07 - Thermal and Moisture Protection
- .1 07 21 13 - Board Insulation (cavity wall rigid board insulation only related to masonry scope)

□

.2 07 21 19 - Foamed-In-Place Insulation (cavity wall locations only related to masonry scope)
.3 07 27 10 - Air Barriers (related to masonry installation scope)

.5 Division 08 - Openings
.1 08 11 14 - Metal Doors and Frames (installation of frames only, in area of work)

.6 Division 05 - Metals
.1 05 10 00 - Structural Metal Framing (installation of loose lintels, wall plates, etc in area of work)

.7 Reinforcing and concrete fill in masonry walls.

1.9 SUBCONTRACT No. Project No.: 24106-SC03 – MECHANICAL

.1 Report directly to the Contractor on all matters pertaining to the execution of the Work.

.2 Maintain site cleanliness on a daily basis as it applies to the work of this Subcontract and ensure conformance to the requirements of authorities having jurisdiction with respect to waste audits and waste reduction work plans.

.3 Sections listed as part of a particular Subcontract package may include work described under other Sections. When referenced as a Related Section, include such portions of the Work as part of that particular Subcontract.

.4 Include the following Work as part of Subcontract Project No.: 24106-SC03:

.1 Division 00
.1 00 52 11 - Subcontract Agreement
.2 00 71 11 - Subcontracting Definitions
.3 00 72 11 - Subcontract Conditions
.4 00 73 11 - Supplementary Subcontract Conditions.

.2 Division 01 - General Requirements
.1 Administrative / procedural sections applicable to all contracts as listed above.
.2 Provide and pay for those items listed above in the temporary utilities, facilities and services as required for the Subcontract Work.

Division 20 Common Requirements for Mechanical
.1 20 00 01 Mechanical Specification Index

.3 Common Contract Requirements for Mechanical
.1 20 02 21 Mechanical Supplemental Tender Form
.2 20 02 51 Mechanical Contract Requirements

.4 Common Work Results for Mechanical
.1 20 05 11 Mechanical Work Requirements
.2 20 05 31 Expansion Fittings and Loops
.3 20 05 32 Thermometers and Pressure Gauges
.4 20 05 34 Bases, Hangers and Supports
.5 20 05 49 Vibration Control Measures
.6 20 05 53 Identification of Mechanical Services

.5 Commissioning for Mechanical
.1 20 08 11 Mechanical Contractor Commissioning Requirements

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Division 21 Fire Suppression
.6 Fire-Suppression Sprinkler Systems
.1 21 13 13 Wet Pipe Fire Suppression
Division 22 Plumbing
.7 Common Work Results for Plumbing
.1 22 05 33 Heat Tracing for Plumbing & Drainage
.8 Plumbing Insulation
.1 22 07 19 Plumbing Piping Insulation
.9 Facility Water Distribution
.1 22 11 11 Site Services - Water Mains
.2 22 11 16 Domestic Water Piping - Copper
.3 22 11 20 Backflow and Cross Connection Measures
.4 22 11 22 Domestic Water Circulation Pump
.5 22 11 31 Potable Water Auxiliary Equipment
.10 Facility Sanitary Sewerage
.1 22 13 13 Sanitary Drains
.2 22 13 16 Sanitary Waste and Vent Piping – Cast Iron and Copper
.3 22 13 17 Sanitary Waste and Vent Piping – Plastic
.4 22 13 23 Sanitary Interceptors
.11 Facility Storm Drainage
.1 22 14 15 Storm Drainage Piping – Cast Iron and Copper
.2 22 14 16 Storm Drainage Piping - Plastic
.3 22 14 26 Storm Drains
.12 Fuel-Fired Domestic Water Heaters
.1 22 34 36 Fuel-Fired Domestic Water Heaters
.13 Plumbing Auxiliary Equipment
.1 22 36 13 Plumbing Auxiliary Equipment
.14 Fire Extinguishers
.1 22 37 13 Portable Fire Extinguishers
.15 Plumbing Fixtures
.1 22 44 13 Plumbing Fixture Combined with Drawing Schedule
Division 23 Heating, Ventilating, and Air
.16 Conditioning (HVAC)
.17 Common Work Results for Integrated Automation
.1 23 05 11 Variable Frequency Drives
.18 Common Work Results for HVAC
.1 23 05 81 Pipe Welding
.19 HVAC Insulation
.1 23 07 13 Duct Insulation
.2 23 07 19 HVAC Piping Insulation
.20 Facility Fuel Piping
.1 23 11 23 Facility Natural-Gas & Propane Piping
.21 Hydronic Piping and Pumps
.1 23 21 11 Hydronic Accessories
.2 23 21 13 Hydronic Piping (Welded)
.3 23 21 23 Pumps Hydronic
.22 Refrigerant Piping
.1 23 23 13 Refrigerant Piping and Specialties
.23 HVAC Water Treatment

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.1 23 25 13 HVAC Water Treatment

.24 HVAC Ducts and Casings
- .1 23 31 13 Metal Ducts

.25 Air Plenums and Chases
- .1 23 32 13 Fabricated, Metal Air Plenums

.26 Air Duct Accessories
- .1 23 33 13 Duct Accessories
- .2 23 33 13.13 Volume-Control Dampers
- .3 23 33 16 Fire Dampers
- .4 23 33 17 Smoke Control Dampers
- .5 23 33 18 Operating Dampers
- .6 23 33 19 Duct Silencers
- .7 23 33 46 Flexible Ducts
- .8 23 33 53 Duct Liners

.27 HVAC Fans
- .1 23 34 11 Commercial Fans
- .2 23 34 23 Packaged Exhausters
- .3 23 34 41 Destratification Fans

.28 Air Terminal Units
- .1 23 36 16 Variable-Air Volume Units

.29 Air Outlets and Inlets
- .1 23 37 13 Diffusers, Registers, and Grilles
- .2 23 37 23 Louvres and Vents for Intake and Exhaust

.30 Breeching, Chimneys, and Stacks
- .1 23 51 33 Insulated Sectional Chimneys

.31 Heating Boilers
- .1 23 52 13 Stainless Steel Condensing Boilers

.32 Air-To-Air Energy Recovery Equipment
- .1 23 72 13 Heat-Wheel Air-to-Air Energy-Recovery Ventilators

.33 Indoor Central-Station Air-Handling Units
- .1 23 73 23 Built-Up Indoor Air Handling Units

.34 Packaged Outdoor HVAC Equipment
- .1 23 74 43 Packaged Rooftop HVAC Units

.35 Decentralized Unitary HVAC Equipment
- .1 23 81 23 Computer Room Air Conditioners

.36 Convection Heating and Cooling Units
- .1 23 82 29 Radiators, Convectors, and Cabinet Heaters
- .2 23 82 31 Hydronic Radiant Ceiling Panels

1.10 SUBCONTRACT No. Project No.: 24106-SC04 - ELECTRICAL

.1 Report directly to the Contractor on all matters pertaining to the execution of the Work.

.2 Maintain site cleanliness on a daily basis as it applies to the work of this Subcontract and ensure conformance to the requirements of authorities having jurisdiction with respect to waste audits and waste reduction work plans.

□

.3 Sections listed as part of a particular Subcontract package may include work described under other Sections. When referenced as a Related Section, include such portions of the Work as part of that particular Subcontract.

.4 Include the following Work as part of Subcontract Project No.: 24106-SC04:

- .1 Division 00
  - .1 00 52 11 - Subcontract Agreement
  - .2 00 71 11 - Subcontracting Definitions
  - .3 00 72 11 - Subcontract Conditions
  - .4 00 73 11 - Supplementary Subcontract Conditions.
- .2 Division 01 - General Requirements
  - .1 Administrative / procedural sections applicable to all contracts as listed above.
  - .2 Provide and pay for those items listed above in the temporary utilities, facilities and services as required for the Subcontract Work.
- .3 Division 26 Common Requirements for Electrical
  - .1 26 00 11 Electrical Specification Index
- .4 Common Contract Requirements for Electrical
  - .1 26 01 13 Electrical Supplemental Tender Form
  - .2 26 01 15 Electrical Allowances and Fees
  - .3 26 01 16 Electrical General Requirements
  - .4 26 01 20 Commissioning and Integrated Testing of Life Safety and Fire Protection System
- .5 Common Work Results for Electrical
  - .1 26 05 19 Wires and Cables
  - .2 26 05 20 Junction and Pull Boxes
  - .3 26 05 21 Outlet Boxes, Conduit Boxes and Fittings
  - .4 26 05 22 Wire and Box Connectors – 0 –1000 V
  - .5 26 05 26 Grounding Secondary
  - .6 26 05 33 Conduits, Conduit Fastenings and Conduit Fittings
  - .7 26 05 43 Installation of Cables in Trenches and Ducts
  - .8 26 05 73 Short Circuit/Coordination Study
  - .9 26 05 75 Auxiliary Systems
  - .10 26 05 76 Electric Heating Systems
- .6 Low-Voltage Transformers
  - .1 26 22 13 Dry Type Transformers
- .7 Switchboard and Panelboards
  - .1 26 24 13 Service Entrance Board
  - .2 26 24 16 Panelboards
  - .3 26 24 17 Moulded Case Circuit Breakers
- .8 Low-Voltage Distribution Equipment
  - .1 26 27 26 Wiring Devices
- .9 Low-Voltage Circuit Protective Devices
  - .1 26 28 13 Fuses – Low Voltage
  - .2 26 28 16 Disconnect Switches
- .10 Low-Voltage Controllers
  - .1 26 29 13 Starters and Contactors
- .11 Electrical and Cathodic Protection

□

.1 26 43 13 Surge Protective Devices
.12 Interior Lighting
.1 26 51 13 Lighting Equipment
.13 Division 28 Electronic Safety and Security
.14 Fire Detection and Alarm
.1 28 31 25 Fire Alarm System (Addressable)

1.11 SUBCONTRACT No. Project No.: 24106-SC05 – PRECAST CONCRETE

.1 Report directly to the Contractor on all matters pertaining to the execution of the Work.

.2 Maintain site cleanliness on a daily basis as it applies to the work of this Subcontract and ensure conformance to the requirements of authorities having jurisdiction with respect to waste audits and waste reduction work plans.

.3 Sections listed as part of a particular Subcontract package may include work described under other Sections. When referenced as a Related Section, include such portions of the Work as part of that particular Subcontract.

.4 Include the following Work as part of Subcontract Project No.: 24106-SC05:

.1 Division 00
.1 00 52 11 - Subcontract Agreement
.2 00 71 11 - Subcontracting Definitions
.3 00 72 11 - Subcontract Conditions
.4 00 73 11 - Supplementary Subcontract Conditions.
.2 Division 01 - General Requirements
.1 Administrative / procedural sections applicable to all contracts as listed above.
.2 Provide and pay for those items listed above in the temporary utilities, facilities and services as required for the Subcontract Work.
.3 Division 03 - Concrete
.1 03 41 13 – Precast Concrete Hollow Core Planks

1.11 SUBCONTRACT No. Project No.: 24106-SC06 - STRUCTURAL STEEL

.1 Report directly to the Contractor on all matters pertaining to the execution of the Work.

.2 Maintain site cleanliness on a daily basis as it applies to the work of this Subcontract and ensure conformance to the requirements of authorities having jurisdiction with respect to waste audits and waste reduction work plans.

.3 Sections listed as part of a particular Subcontract package may include work described under other Sections. When referenced as a Related Section, include such portions of the Work as part of that particular Subcontract.

.4 Include the following Work as part of Subcontract Project No.: 24106-SC06:

□

.1 Division 00
  .1 00 52 11 - Subcontract Agreement
  .2 00 71 11 - Subcontracting Definitions
  .3 00 72 11 - Subcontract Conditions
  .4 00 73 11 - Supplementary Subcontract Conditions.
.2 Division 01 - General Requirements
  .1 Administrative / procedural sections applicable to all contracts as listed above.
  .2 Provide and pay for those items listed above in the temporary utilities, facilities and services as required for the Subcontract Work.
.3 Division 05 - Metals
  .1 05 12 13 - Architecturally Exposed Structural Steel
  .2 05 21 19 - Structural Steel and Open Web Steel Joist Framing
  .3 05 31 23 - Steel Roof Decking

1.12 SUBCONTRACT No. Project No.: 24106-SC07 - MEMBRANE ROOFING

.1 Report directly to the Contractor on all matters pertaining to the execution of the Work.

.2 Maintain site cleanliness on a daily basis as it applies to the work of this Subcontract and ensure conformance to the requirements of authorities having jurisdiction with respect to waste audits and waste reduction work plans.

.3 Sections listed as part of a particular Subcontract package may include work described under other Sections. When referenced as a Related Section, include such portions of the Work as part of that particular Subcontract.

.4 Include the following Work as part of Subcontract Project No.: 24106-SC07:

.1 Division 00
  .1 00 52 11 - Subcontract Agreement
  .2 00 71 11 - Subcontracting Definitions
  .3 00 72 11 - Subcontract Conditions
  .4 00 73 11 - Supplementary Subcontract Conditions.
.2 Division 01 - General Requirements
  .1 Administrative / procedural sections applicable to all contracts as listed above.
  .2 Provide and pay for those items listed above in the temporary utilities, facilities and services as required for the Subcontract Work.
.4 Division 07 - Thermal and Moisture Protection
  .1 07 52 16 - SBS Modified Bituminous Membrane Roofing
  .2 07 62 00 - Sheet Metal Flashing and Trim (roof parapet flashing only.)

1.13 SUBCONTRACT No. Project No.: 24106-SC08 - ALUMINUM WINDOWS & CURTAINWALL

.1 Report directly to the Contractor on all matters pertaining to the execution of the Work.

□

.2 Maintain site cleanliness on a daily basis as it applies to the work of this Subcontract and ensure conformance to the requirements of authorities having jurisdiction with respect to waste audits and waste reduction work plans.

.3 Sections listed as part of a particular Subcontract package may include work described under other Sections. When referenced as a Related Section, include such portions of the Work as part of that particular Subcontract.

.4 Include the following Work as part of Subcontract Project No.: 24106-SC08:

.1 Division 00
- .1 00 52 11 - Subcontract Agreement
- .2 00 71 11 - Subcontracting Definitions
- .3 00 72 11 - Subcontract Conditions
- .4 00 73 11 - Supplementary Subcontract Conditions.

.2 Division 01 - General Requirements
- .1 Administrative / procedural sections applicable to all contracts as listed above.
- .2 Provide and pay for those items listed above in the temporary utilities, facilities and services as required for the Subcontract Work.

.3 Division 08 - Openings
- .1 08 13 16 - Aluminum Doors
- .2 08 44 13 - Glazed Aluminum Curtain Wall
- .3 08 50 50 - Aluminum Windows
- .4 08 71 10 - Finish Hardware - General (Install of aluminum door hardware only)
- .5 08 71 15 – Finish Hardware Schedule (reference for aluminum door hardware only)
- .6 08 80 50 - Glazing

1.14 SUBCONTRACT No. Project No.: 24106-SC09 - ELEVATORS

.1 Report directly to the Contractor on all matters pertaining to the execution of the Work.

.2 Maintain site cleanliness on a daily basis as it applies to the work of this Subcontract and ensure conformance to the requirements of authorities having jurisdiction with respect to waste audits and waste reduction work plans.

.3 Sections listed as part of a particular Subcontract package may include work described under other Sections. When referenced as a Related Section, include such portions of the Work as part of that particular Subcontract.

.4 Include the following Work as part of Subcontract Project No.: 24106-SC09:

.1 Division 00
- .1 00 52 11 - Subcontract Agreement
- .2 00 71 11 - Subcontracting Definitions

□

.3 00 72 11 - Subcontract Conditions
.4 00 73 11 - Supplementary Subcontract Conditions.

.2 Division 01 - General Requirements
.1 Administrative / procedural sections applicable to all contracts as listed above.
.2 Provide and pay for those items listed above in the temporary utilities, facilities and services as required for the Subcontract Work.

.3 Division 14 – Conveying Systems
.1 14 21 23 – Hydraulic Passenger Elevators

1.15 SUBCONTRACT No. Project No.: 24106-SC10 – PAVING

.1 Report directly to the Contractor on all matters pertaining to the execution of the Work.

.2 Maintain site cleanliness on a daily basis as it applies to the work of this Subcontract and ensure conformance to the requirements of authorities having jurisdiction with respect to waste audits and waste reduction work plans.

.3 Sections listed as part of a particular Subcontract package may include work described under other Sections. When referenced as a Related Section, include such portions of the Work as part of that particular Subcontract.

.4 Include the following Work as part of Subcontract Project No.: 24106-SC10:

.1 Division 00
.1 00 52 11 - Subcontract Agreement
.2 00 71 11 - Subcontracting Definitions
.3 00 72 11 - Subcontract Conditions
.4 00 73 11 - Supplementary Subcontract Conditions.

.2 Division 01 - General Requirements
.1 Administrative / procedural sections applicable to all contracts as listed above.
.2 Provide and pay for those items listed above in the temporary utilities, facilities and services as required for the Subcontract Work.

.3 Division 03, 31 & 32 – Earthwork & Site Improvements
.1 03 10 01 Landscape Concrete Forming and Accessories
.2 03 30 01 Landscape Cast-in-Place Concrete
.3 31 23 10 Excavating, Trenching and Backfilling (excluding interior building areas)
.4 31 23 13 Rough Grading (making good below paved areas only)
.5 32 12 16 Asphalt Paving (including subgrade granulars)
.6 32 13 13 Concrete Paving and Edges (including subgrade granulars, curbs and poured concrete seatwalls)
.7 32 13 14 Detectable Warning Panels
.8 32 14 13 Precast Concrete Unit Paving (including subgrade granulars)
.9 32 17 23 Pavement Markings

□

1.16 SUBCONTRACT No. Project No.: 24106-SC11 – LANDSCAPING

.1 Report directly to the Contractor on all matters pertaining to the execution of the Work.

.2 Maintain site cleanliness on a daily basis as it applies to the work of this Subcontract and ensure conformance to the requirements of authorities having jurisdiction with respect to waste audits and waste reduction work plans.

.3 Sections listed as part of a particular Subcontract package may include work described under other Sections. When referenced as a Related Section, include such portions of the Work as part of that particular Subcontract.

.4 Include the following Work as part of Subcontract Project No.: 24106-SC11:

.1 Division 00
- .1 00 52 11 - Subcontract Agreement
- .2 00 71 11 - Subcontracting Definitions
- .3 00 72 11 - Subcontract Conditions
- .4 00 73 11 - Supplementary Subcontract Conditions.

.2 Division 01 - General Requirements
- .1 Administrative / procedural sections applicable to all contracts as listed above.
- .2 Provide and pay for those items listed above in the temporary utilities, facilities and services as required for the Subcontract Work.

.3 Division 10, 11 & 32 Specialties & Exterior Improvements
- .1 10 73 28 Landscape Structures
- .2 11 68 13 Playground Equipment
- .3 31 22 00 Landscape Grading
- .4 32 01 90 Tree Preservation
- .5 32 12 17 Play Surfacing
- .6 32 12 18 Rubber Play Surfacing
- .7 32 18 13 Synthetic Grass Surfacing
- .8 32 31 13 Fences and Gates
- .9 32 31 19 Decorative Metal Fences and Gates
- .10 32 33 00 Site Furnishings
- .11 32 90 00 Landscape Maintenance
- .12 32 91 19 Topsoil and Finish Grading
- .13 32 92 23 Sodding
- .14 32 93 10 Trees, Shrubs and Groundcover Planting
- .15 32 94 13 Landscape Edging
- .16 32 94 20 Landscape Boulders
- .17 32 94 50 Structural Soil Cells
- .18 32 94 55 Soil Cell Filler Soil
- .19 33 46 00 Landscape Subdrainage

1.17 SUBCONTRACT No. Project No.: 24106-SC12 - PAINTING AND FINISHING

.1 Report directly to the Contractor on all matters pertaining to the execution of the Work.

□

.2 Maintain site cleanliness on a daily basis as it applies to the work of this Subcontract and ensure conformance to the requirements of authorities having jurisdiction with respect to waste audits and waste reduction work plans.

.3 Sections listed as part of a particular Subcontract package may include work described under other Sections. When referenced as a Related Section, include such portions of the Work as part of that particular Subcontract.

.4 Include the following Work as part of Subcontract Project No.: 24106-SC12:

.1 Division 00
- .1 00 52 11 - Subcontract Agreement
- .2 00 71 11 - Subcontracting Definitions
- .3 00 72 11 - Subcontract Conditions
- .4 00 73 11 - Supplementary Subcontract Conditions.

.2 Division 01 - General Requirements
- .1 Administrative / procedural sections applicable to all contracts as listed above.
- .2 Provide and pay for those items listed above in the temporary utilities, facilities and services as required for the Subcontract Work.

.3 Division 09 - Finishes
- .1 09 91 22 – Painting
- .2 09 91 27 - Finishes and Colour Notes (reference)
- .3 09 91 30 - Room Finish Schedule (reference)
- .4 09 97 24 - Concrete Floor Sealer System

1.18 SUBCONTRACT No. Project No.: 24106-SC13 – MILLWORK

.1 Report directly to the Contractor on all matters pertaining to the execution of the Work.

.2 Maintain site cleanliness on a daily basis as it applies to the work of this Subcontract and ensure conformance to the requirements of authorities having jurisdiction with respect to waste audits and waste reduction work plans.

.3 Sections listed as part of a particular Subcontract package may include work described under other Sections. When referenced as a Related Section, include such portions of the Work as part of that particular Subcontract.

.4 Include the following Work as part of Subcontract Project No.: 24106-SC13:

.1 Division 00
- .1 00 52 11 - Subcontract Agreement
- .2 00 71 11 - Subcontracting Definitions
- .3 00 72 11 - Subcontract Conditions
- .4 00 73 11 - Supplementary Subcontract Conditions.

.2 Division 01 - General Requirements
- .1 Administrative / procedural sections applicable to all contracts as listed above.

□

.2 Provide and pay for those items listed above in the temporary utilities, facilities and services as required for the Subcontract Work.

.3 Division 06 - Wood and Plastics
- .1 06 40 00 - Architectural Woodwork
- .2 06 47 00 - Plastic Laminates (for millwork)

.4 Division 08 - Openings
- .1 08 71 00 - Door Hardware (install of teacher closet locks supplied by SC-24).

1.19 SUBCONTRACT No. Project No.: 24106-SC14 - DRYWALL AND ACOUSTICS

.1 Report directly to the Contractor on all matters pertaining to the execution of the Work.

.2 Maintain site cleanliness on a daily basis as it applies to the work of this Subcontract and ensure conformance to the requirements of authorities having jurisdiction with respect to waste audits and waste reduction work plans.

.3 Sections listed as part of a particular Subcontract package may include work described under other Sections. When referenced as a Related Section, include such portions of the Work as part of that particular Subcontract.

.4 Include the following Work as part of Subcontract Project No.: 24106-SC14:

.1 Division 00
- .1 00 52 11 - Subcontract Agreement
- .2 00 71 11 - Subcontracting Definitions
- .3 00 72 11 - Subcontract Conditions
- .4 00 73 11 - Supplementary Subcontract Conditions.

.2 Division 01 - General Requirements
- .1 Administrative / procedural sections applicable to all contracts as listed above.
- .2 Provide and pay for those items listed above in the temporary utilities, facilities and services as required for the Subcontract Work.

.3 Division 09 - Finishes
- .1 09 21 16 - Gypsum Board Assemblies
- .2 09 22 16 - Non-Structural Metal Framing
- .3 09 51 13 - Acoustical Panel Ceilings
- .4 09 84 10 - Acoustical Wall Treatment

.4 Division 08 - Openings
- .1 08 11 14 - Metal Doors and Frames **(installation of frames only, in area of work)**

.5 Division 05 - Metals
- .1 05 41 50 – Lateral Load Bearing Metal Stud System

1.20 SUBCONTRACT No. Project No.: 24106-SC15 – FLOORING

.1 Report directly to the Contractor on all matters pertaining to the execution of the Work.

□

.2 Maintain site cleanliness on a daily basis as it applies to the work of this Subcontract and ensure conformance to the requirements of authorities having jurisdiction with respect to waste audits and waste reduction work plans.

.3 Sections listed as part of a particular Subcontract package may include work described under other Sections. When referenced as a Related Section, include such portions of the Work as part of that particular Subcontract.

.4 Include the following Work as part of Subcontract Project No.: 24106-SC15:

.1 Division 00
- .1 00 52 11 - Subcontract Agreement
- .2 00 71 11 - Subcontracting Definitions
- .3 00 72 11 - Subcontract Conditions
- .4 00 73 11 - Supplementary Subcontract Conditions.

.2 Division 01 - General Requirements
- .1 Administrative / procedural sections applicable to all contracts as listed above.
- .2 Provide and pay for those items listed above in the temporary utilities, facilities and services as required for the Subcontract Work.

.3 Division 09 - Finishes
- .1 09 30 13 - Ceramic Tiling
- .2 09 65 16 - Resilient Sheet Flooring
- .3 09 65 19 - Resilient Tile Flooring
- .4 09 68 00 - Carpeting

1.20 SUBCONTRACT No. Project No.: 24106-SC16 – TESTING & BALANCING

.1 Report directly to the Contractor on all matters pertaining to the execution of the Work.

.2 Maintain site cleanliness on a daily basis as it applies to the work of this Subcontract and ensure conformance to the requirements of authorities having jurisdiction with respect to waste audits and waste reduction work plans.

.3 Sections listed as part of a particular Subcontract package may include work described under other Sections. When referenced as a Related Section, include such portions of the Work as part of that particular Subcontract.

.4 Include the following Work as part of Subcontract Project No.: 24106-SC16:

.1 Division 00
- .1 00 52 11 - Subcontract Agreement
- .2 00 71 11 - Subcontracting Definitions
- .3 00 72 11 - Subcontract Conditions
- .4 00 73 11 - Supplementary Subcontract Conditions.

.2 Division 01 - General Requirements
- .1 Administrative / procedural sections applicable to all contracts as listed above.

□

.2 Provide and pay for those items listed above in the temporary utilities, facilities and services as required for the Subcontract Work.

.3 Division 20 – Common Requirements for Mechanical

.1 20 06 11 – Testing, Adjusting, and Balancing (TAB) of Mechanical Systems

1.20 SUBCONTRACT No. Project No.: 24106-SC17 – METAL LOCKERS

.1 Report directly to the Contractor on all matters pertaining to the execution of the Work.

.2 Maintain site cleanliness on a daily basis as it applies to the work of this Subcontract and ensure conformance to the requirements of authorities having jurisdiction with respect to waste audits and waste reduction work plans.

.3 Sections listed as part of a particular Subcontract package may include work described under other Sections. When referenced as a Related Section, include such portions of the Work as part of that particular Subcontract.

.4 Include the following Work as part of Subcontract Project No.: 24106-SC17:

.1 Division 00

.1 00 52 11 - Subcontract Agreement
.2 00 71 11 - Subcontracting Definitions
.3 00 72 11 - Subcontract Conditions
.4 00 73 11 - Supplementary Subcontract Conditions.

.2 Division 01 - General Requirements

.1 Administrative / procedural sections applicable to all contracts as listed above.
.2 Provide and pay for those items listed above in the temporary utilities, facilities and services as required for the Subcontract Work.

.3 Division 10 - Specialties

.1 10 51 13 – Metal Lockers

1.21 SUBCONTRACT No. Project No.: 24106-SC18–WHITEBOARDS & TACKBOARD

.1 Report directly to the Contractor on all matters pertaining to the execution of the Work.

.2 Maintain site cleanliness on a daily basis as it applies to the work of this Subcontract and ensure conformance to the requirements of authorities having jurisdiction with respect to waste audits and waste reduction work plans.

.3 Sections listed as part of a particular Subcontract package may include work described under other Sections. When referenced as a Related Section, include such portions of the Work as part of that particular Subcontract.

.4 Include the following Work as part of Subcontract Project No.: 24106-SC18:

.1 Division 00

□

.1 00 52 11 - Subcontract Agreement
.2 00 71 11 - Subcontracting Definitions
.3 00 72 11 - Subcontract Conditions
.4 00 73 11 - Supplementary Subcontract Conditions.

.2 Division 01 - General Requirements
.1 Administrative / procedural sections applicable to all contracts as listed above.
.2 Provide and pay for those items listed above in the temporary utilities, facilities and services as required for the Subcontract Work.

.3 Division 10 - Specialties
.1 10 11 16 – Whiteboards & Tackboards

1.21 SUBCONTRACT No. Project No.: 24106-SC19–GYMNASIUM EQUIPMENT

.1 Report directly to the Contractor on all matters pertaining to the execution of the Work.

.2 Maintain site cleanliness on a daily basis as it applies to the work of this Subcontract and ensure conformance to the requirements of authorities having jurisdiction with respect to waste audits and waste reduction work plans.

.3 Sections listed as part of a particular Subcontract package may include work described under other Sections. When referenced as a Related Section, include such portions of the Work as part of that particular Subcontract.

.4 Include the following Work as part of Subcontract Project No.: 24106-SC19:

.1 Division 00
.1 00 52 11 - Subcontract Agreement
.2 00 71 11 - Subcontracting Definitions
.3 00 72 11 - Subcontract Conditions
.4 00 73 11 - Supplementary Subcontract Conditions.

.2 Division 01 - General Requirements
.1 Administrative / procedural sections applicable to all contracts as listed above.
.2 Provide and pay for those items listed above in the temporary utilities, facilities and services as required for the Subcontract Work.

.3 Division 10 - Specialties
.1 11 52 00 – Gymnasium Equipment

1.21 SUBCONTRACT No. Project No.: 24106-SC20–OPERABLE PARTITION

.1 Report directly to the Contractor on all matters pertaining to the execution of the Work.

.2 Maintain site cleanliness on a daily basis as it applies to the work of this Subcontract and ensure conformance to the requirements of authorities having jurisdiction with respect to waste audits and waste reduction work plans.

□

.3 Sections listed as part of a particular Subcontract package may include work described under other Sections. When referenced as a Related Section, include such portions of the Work as part of that particular Subcontract.

.4 Include the following Work as part of Subcontract Project No.: 24106-SC20:

.1 Division 00
- .1 00 52 11 - Subcontract Agreement
- .2 00 71 11 - Subcontracting Definitions
- .3 00 72 11 - Subcontract Conditions
- .4 00 73 11 - Supplementary Subcontract Conditions.

.2 Division 01 - General Requirements
- .1 Administrative / procedural sections applicable to all contracts as listed above.
- .2 Provide and pay for those items listed above in the temporary utilities, facilities and services as required for the Subcontract Work.

.3 Division 10 - Specialties
- .1 10 22 27 – Folding Panel Partition

1.21 SUBCONTRACT No. Project No.: 24106-SC21–TOILET PARTITIONS

.1 Report directly to the Contractor on all matters pertaining to the execution of the Work.

.2 Maintain site cleanliness on a daily basis as it applies to the work of this Subcontract and ensure conformance to the requirements of authorities having jurisdiction with respect to waste audits and waste reduction work plans.

.3 Sections listed as part of a particular Subcontract package may include work described under other Sections. When referenced as a Related Section, include such portions of the Work as part of that particular Subcontract.

.4 Include the following Work as part of Subcontract Project No.: 24106-SC23:

.1 Division 00
- .1 00 52 11 - Subcontract Agreement
- .2 00 71 11 - Subcontracting Definitions
- .3 00 72 11 - Subcontract Conditions
- .4 00 73 11 - Supplementary Subcontract Conditions.

.2 Division 01 - General Requirements
- .1 Administrative / procedural sections applicable to all contracts as listed above.
- .2 Provide and pay for those items listed above in the temporary utilities, facilities and services as required for the Subcontract Work.

.3 Division 10 - Specialties
- .1 10 21 20 – Laminated Plastic Toilet Partitions

1.21 SUBCONTRACT No. Project No.: 24106-SC22 - FINISH HARDWARE

.1 Report directly to the Contractor on all matters pertaining to the execution of the Work.

□

.2 Maintain site cleanliness on a daily basis as it applies to the work of this Subcontract and ensure conformance to the requirements of authorities having jurisdiction with respect to waste audits and waste reduction work plans.

.3 Sections listed as part of a particular Subcontract package may include work described under other Sections. When referenced as a Related Section, include such portions of the Work as part of that particular Subcontract.

.4 Include the following Work as part of Subcontract Project No.: 24106-SC22:

.1 Division 00
- .1 00 52 11 - Subcontract Agreement
- .2 00 71 11 - Subcontracting Definitions
- .3 00 72 11 - Subcontract Conditions
- .4 00 73 11 - Supplementary Subcontract Conditions.

.2 Division 01 - General Requirements
- .1 Administrative / procedural sections applicable to all contracts as listed above.
- .2 Provide and pay for those items listed above in the temporary utilities, facilities and services as required for the Subcontract Work.

.3 Division 08 - Openings
- .1 08 71 10 – Finish Hardware (supply and install)
- .2 08 71 15 – Finish Hardware Schedule (supply and install)

1.22 SUBCONTRACT No. Project No.: 24106-S23 - METAL SIDING & PANELS

.1 Report directly to the Contractor on all matters pertaining to the execution of the Work.

.2 Maintain site cleanliness on a daily basis as it applies to the work of this Subcontract and ensure conformance to the requirements of authorities having jurisdiction with respect to waste audits and waste reduction work plans.

.3 Sections listed as part of a particular Subcontract package may include work described under other Sections. When referenced as a Related Section, include such portions of the Work as part of that particular Subcontract.

.4 Include the following Work as part of Subcontract Project No.: 24106-SC23:

.1 Division 00
- .1 00 52 11 - Subcontract Agreement
- .2 00 71 11 - Subcontracting Definitions
- .3 00 72 11 - Subcontract Conditions
- .4 00 73 11 - Supplementary Subcontract Conditions.

.2 Division 01 - General Requirements
- .1 Administrative / procedural sections applicable to all contracts as listed above.
- .2 Provide and pay for those items listed above in the temporary utilities, facilities and services as required for the Subcontract Work.

□

.3 Division 07 - Thermal and Moisture Protection
- .1 07 41 43 - Aluminum Composite Panels
- .2 07 46 13 - Metal Siding
- .3 07 62 00 - Sheet Metal Flashing and Trim (not including roof parapet flashing, which is to supplied and installed by SC-07 Membrane Roofing)

1.23 SUBCONTRACT No. Project No.: 24106-SC24 - BUILDING CONTROLS

.1 Report directly to the Contractor on all matters pertaining to the execution of the Work.

.2 Maintain site cleanliness on a daily basis as it applies to the work of this Subcontract and ensure conformance to the requirements of authorities having jurisdiction with respect to waste audits and waste reduction work plans.

.3 Sections listed as part of a particular Subcontract package may include work described under other Sections. When referenced as a Related Section, include such portions of the Work as part of that particular Subcontract.

.4 Include the following Work as part of Subcontract Project No.: 24106-SC24:

.1 Division 00
- .1 00 52 11 - Subcontract Agreement
- .2 00 71 11 - Subcontracting Definitions
- .3 00 72 11 - Subcontract Conditions
- .4 00 73 11 - Supplementary Subcontract Conditions.

.2 Division 01 - General Requirements
- .1 Administrative / procedural sections applicable to all contracts as listed above.
- .2 Provide and pay for those items listed above in the temporary utilities, facilities and services as required for the Subcontract Work.

.3 Division 25 - Integrated Automation
- .1 To be tendered at a later date.

.5 Owner will carry $400,000 Allowance for this, in addition to the Cash Allowance.

1.24 CONTRACTOR ACCESS TO AND USE OF THE PLACE OF THE WORK

.1 The Contractor will be granted access to the site upon award of the project.

1.25 OWNER OCCUPANCY OF THE FACILITY

.1 Cooperate with Owner and Consultant in scheduling occupancy of facility.

1.26 PHASING OF THE WORK

.1 If required, phasing of work may be discussed with Owner for partial occupancy.

1.27 PARTIAL OWNER OCCUPANCY OF THE WORK

□

.1 Owner may wish to occupy designated areas of the Work in advance of total completion for full use or the storage of equipment and installing equipment.

.2 In accordance with GC 5.10 - Non-Conforming Work, partial Owner occupancy will not be considered as an acceptance of the Work, nor in any way relieve the Contractor of his responsibility to complete the Work.

1.28 SUBSTANTIAL PERFORMANCE OF THE WORK

.1 Refer to GC 5.5 - Substantial Performance of the Work.

.2 Substantial Performance of the Work is required on or before December 31, 2023.

END OF SECTION

□

Part 1 General

1.1 PROJECT MEETINGS FOR COORDINATION

.1 In consultation with the Consultant not later than the second week of construction, arrange for site meetings weekly or every 2 weeks as appropriate to the stage of construction, for project coordination. Such meetings shall fall at the same time each week the meeting is scheduled.

.2 Responsible representatives of the Contractor's and Subcontractor's office and field forces and suppliers shall be obliged to attend.

.3 Inform the Owner, Consultant, and those others whose attendance is obligatory, of the date of each meeting, in sufficient time to ensure their attendance.

.4 Provide physical space for meetings, prepare an agenda, chair and record the minutes of each meeting. Relevant information must be made available to all concerned, in order that problems to be discussed may be expeditiously resolved. Identify "action by: _____".

.5 Within three days after each meeting, distribute two copies of the minutes to each invited person and regular distribution list to be issued by the consultant.

1.2 PRECONSTRUCTION MEETING

.1 Within 5 days after award of Contract, request a meeting of parties in contract to discuss and resolve administrative procedures and responsibilities.

.2 Include in the agenda the following:

- .1 Appointment of official representative of participants in the Work.
- .2 Site Safety and Security
- .3 Scheduling of Work. Schedule to include a detailed breakdown of mechanical and electrical works.
- .4 Interference with ongoing business.
- .5 Work by other Contractors.
- .6 Schedule of submission of shop drawings and samples.
- .7 Requirements for temporary facilities, site sign, offices, storage sheds utilities.
- .8 Delivery schedule of specified equipment and identification of long-lead or other critical items.
- .9 Site security.
- .10 Procedures for Contemplated change notices, change orders, procedures, approvals required, mark-up percentages permitted, time extensions, overtime, administrative requirements.
- .11 Record drawings.
- .12 Maintenance manuals.
- .13 Take-over procedures, acceptance, warranties.

□

.14 Monthly progress claims, administrative procedures, photographs, holdbacks.

.15 Appointments of inspection and testing agencies or firms.

.16 Insurances, transcript of policies.

.17 Schedule for progress meetings.

1.3 PROJECT MEETINGS FOR PROGRESS OF WORK

.1 Conduct progress meetings in accordance with the schedule and/or decisions made at Preconstruction meeting.

.2 Inform the Owner, Consultant, project consultants, Subcontractors and suppliers and those whose attendance is obligatory, of the date of the meeting, in sufficient time to ensure their attendance.

.3 Include in the agenda the following:

.1 Site Safety and security record or incidents.

.2 Review, approval of minutes of previous meeting.

.3 Review of Work progress since previous meeting.

.4 Field observations, problems, conflicts.

.5 Problems which impede construction schedule.

.6 Review of off-site fabrication delivery schedules.

.7 Corrective measures and procedures to regain projected schedule.

.8 Revisions to construction schedule.

.9 Progress during succeeding work period as a “two-week look ahead”.

.10 Review submittal schedules: expedite as required.

.11 Maintenance of quality standards.

.12 Pending changes and substitutions.

.13 Review proposed changes for effect on construction schedule and on completion date.

.14 Other business.

1.4 PROGRESS RECORDS

.1 Maintain a permanent written record on the site of the progress of the work using standard OGCA form. This record shall be available to the Consultant at the site, and a copy shall be furnished to same on request. The record shall contain:

.1 Daily weather conditions, including maximum and minimum temperatures.

.2 Dates of the commencement and completion of stage or portion of the work of each trade in each area of the project.

.3 Conditions encountered during excavation.

.4 Dates of erection and removal of formwork, in each area of the project.

.5 Dates of pouring the concrete in each area of the project, with quantity and Particulars of the concrete.

.6 Work force on project daily per trade and active hours.

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.7 Visits to site by personnel of Consultant, Jurisdictional Authorities and testing companies.

1.5 PROGRESS REPORTS

.1 Submit to the Consultant, Monthly Progress Reports consisting of a concise narrative and a marked-up summary schedule showing physical percentage complete by item and in total. These progress calculations must agree with the Progress Payment Claims. masonry; mechanical, finishing trades and the like. Include with this submission the digital schedule referenced below

1.6 DIGITAL PROJECT SCHEDULES

.1 At the outset of the project, General Contractor to provide and maintain a digital project schedule including Milestone Dates and listing all trades.

.2 Update and issue to Consultant in hard copy and electronic copy not less than monthly and at each Progress Draw. To be issued in format compatible with Microsoft Project program.

.3 At 70% completion, or 16 weeks prior to Substantial Completion, whichever comes first, Project develop a detailed Completion Schedule outlining final coordination and sequences to completion.

1.7 DOCUMENTS REQUIRED AT PROJECT START, DURING CONSTRYCTION AND CLOSE OUT

.1 Refer to Section 01 11 00 – Summary of Work, article 1.44.

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 PRODUCT SUBSTITUTION PROCEDURES

.1 Requests for substitution will only be considered when submitted in sufficient time to permit proper evaluation by the Consultant.

.2 When requesting Consultant review of a proposed Product substitution, demonstrate that the proposed substitute will perform equally as well or better as the specified Product.

.3 Accompany each request for substitution with a list of properties for both the specified Product and the proposed substitute, including the following information:

.1 Product identification, including manufacturer's name, address, telephone and fax numbers, and web site address where available.

.2 Manufacturer's Product data sheets, including material descriptions, compliance with applicable reference standards, and performance and test data.

.3 A summarized comparison of physical properties and performance characteristics for the specified Product and the proposed substitution, and clearly highlighting significant variations.

.4 Indication of availability of maintenance services and sources of replacement materials and parts, including associated costs and time frames.

.5 Indication of cost savings and reduction of construction schedule.

.6 Verification that the substitute will not result in additional costs or a reduction in performance to other portions of the Work.

.7 Reason for requesting the substitution.

.4 The clauses "or equal", "or approved equal", or other similar clauses, will not be construed as an invitation to submit requests for substitution or to unilaterally substitute Products in place of the specified Products and systems.

.5 The abbreviation "eg." means "for example", and a Product listed thereafter is named as an example of the Product upon which the specification is based. Similar Products from other Acceptable Manufacturers are acceptable for use, provided they meet the specified criteria.

.6 Failure to order specified Products in adequate time to meet the approved construction schedule will not be a valid reason to submit a request for substitution. In accordance with GC 6.5 - Delays, such delays remain the responsibility of the Contractor, and will not result in an extension to the Contract Time or be subject to reimbursement by the Owner.

.7 The Owner is under no obligation to consider Product or system substitutions recommended by the Contractor.

□

.8 Remove and replace substitutions incorporated into the Work without the Consultant's written approval.

END OF SECTION

□

Part 1 General

1.1 CLARIFICATIONS

.1 Request written clarifications when the meaning of the Contract Documents is unclear.

.2 Do not proceed with related parts of the Work until clarification is received.

.3 Failure to notify Consultant when the Contract Documents are unclear or inconsistent will result in the Contractor incurring responsibility for resulting deficiencies and additional costs.

.4 Clarifications issued by the Consultant are deemed to supercede the relevant parts of the Contract Documents, regardless whether those documents are cited in the written clarification.

1.2 REQUESTS FOR INTERPRETATION

.1 The Contractor may, after exercising due diligence to locate the required information, request from the Consultant clarification or interpretation of the Contract Documents, hereinafter referred to as a request for interpretation (RFI).

.2 Submit RFI on a form acceptable in content to the Consultant, including a detailed description of the Contractor's review of the Contract Documents leading up to the issuance of the RFI. Requests for interpretation that fail to include a detailed review description, or whose description is insufficient in the opinion of the Consultant, may not be considered and may be rejected.

.3 Maintain a log of RFI sent to and responses received from the Consultant, complete with corresponding dates. Submit updated RFI log with each application for payment.

.4 Submit RFI to Consultant sufficiently in advance of affected parts of the Work so as not to cause delay in the Work. Additional costs incurred as a result of failure to submit an RFI in sufficient time will not be reimbursed by Owner.

.5 Submit one RFI per RFI form, numbered consecutively in a single sequence, in the order submitted.

.6 The Consultant will review and respond to RFI with reasonable promptness.

.7 The Consultant's response to RFI will not be considered a Changer Order or Change Directive, nor does it authorize changes in the Work, the Contract Price and the Contract Time.

.8 If, at any time, the Contractor submits a large quantity of RFI, such that the Consultant cannot process them within a reasonable period of time, then the Consultant will notify the Contractor of such in writing. In this event, the Contractor and the Consultant will jointly prepare an estimate of time necessary for processing the RFI, as well as determining an order of priority among the submitted RFI. The Contractor will accommodate such necessary time at no increase in the Contract Time and Contract Price.

.9 If the information requested in an RFI is apparent from field observations, is contained in the Contract Documents or is reasonably inferable from them, the Contractor shall be responsible to the Owner for reasonable costs charged by the Consultant for additional services required to prepare and issue such information.

.10 A request for interpretation (RFI) will not constitute a notice of claim for a delay.

1.3 CONTRACT MODIFICATION PROCEDURES

.1 Refer to GC 6.1 - Owner's Right to Make Changes, GC 6.2 - Change Order and GC 6.3 - Change Directive.

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.2 Once a Proposed Change has been issued by the Consultant, it shall be the responsibility of the Contractor to ensure that no work is carried out that may increase the cost of the variation contemplated.

.3 The Consultant will assess the fair market cost of each change before issuing a Change Order. Assist the Consultant with this task by quoting variations in a complete manner, listing:
- .1 quantity of each material,
- .2 unit cost of each material,
- .3 man hours involved,
- .4 cost per hour, and
- .5 Subcontractor quotations.

.4 The Consultant may require further quotations in order to show a breakdown of costs.

.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.

.6 Minor variations may be made in the project from time to time as approved by the Consultant. Such alterations or adjustments shall not constitute a change in cost unless a request is made at the time. No extra will be contemplated except where a clear indication is made that extra payment is claimed, in which case a Proposed Change or Change Directive will be issued by the Consultant in accordance with GC 6.1 - Owner's Right to Make Changes, or GC 6.3 - Change Directive. Unless this procedure is followed, no claims for extras will be allowed.

END OF SECTION

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1 General

1.1 COORDINATION

.1 Coordinate the Work to ensure the Work proceeds safely and expeditiously.

.2 Ensure adequate communication among involved parties.

.3 Allocate mobilization areas of the Place of the Work; for field offices and sheds, for access, traffic, and parking facilities.

.4 Coordinate use of the Place of the Work and facilities through procedures for submittals, reports and records, schedules, coordination of Drawings, recommendations, and resolution of ambiguities and conflicts.

.5 Submit information required for preparation of coordination and interference drawings. Review and approve revised drawings for submission to Consultant.

1.2 DOCUMENTS AT THE PLACE OF THE WORK

.1 Maintain an up-to-date copy of the following documents at the Place of the Work:

- .1 The Contract Documents, including the Drawings, Specifications, addenda, bid revisions, Notices in Writing, Supplemental Instructions, proposed changes, Change Orders, Change Directives, and other modifications to the Contract.
- .2 Accepted Shop Drawings, Product data and samples.
- .3 Quality control submittals, including test and evaluation reports.
- .4 Manufacturer's instructions, including installation and maintenance guidelines.
- .5 Construction schedule.
- .6 Additional requested schedules.
- .7 Consultant's field review reports and deficiency reports.
- .8 Reports from authorities having jurisdiction.
- .9 Permits.
- .10 Construction daily log.
- .11 Record as-built documents as described in Section 01 78 00.

.2 Make documents available to Consultant for review at the Place of the Work.

.3 Construction Daily Log: Maintain a construction log, recording on a daily basis the following information:

- .1 Number of workers actively working at the Place of the Work, organized on a Trade Contract basis.
- .2 Subcontractors working at the Place of the Work.
- .3 Identify the parts of the Work being worked on.
- .4 Identify the working hours being kept at the Place of the Work.
- .5 Activities with intermittent progress.
- .6 Time lost with an explanation as to cause.
- .7 Difficulties encountered, such as construction activity delays, labour inefficiencies, labour shortages, etc.
- .8 Product deliveries.

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.9 Equipment mobilization and de-mobilization.
.10 Demolition conditions.
.11 Start and finish dates for each part of the Work.

1.3 OTHER CONTRACTORS

.1 Cooperate with any separate contractor employed by the Owner and, if necessary, co-ordinate with their work.

.2 Submit necessary information to Owner to assist in the required scheduling of such contractors.

1.4 CONTINUANCE OF OWNER OPERATIONS

.1 Coordinate and schedule the Work to minimize any disruption of the normal functions of the existing building.

.2 Changes to the traditional scheduling of construction may be required and certain portions of the Work may not be able to proceed in continuous sequence.

.3 Every reasonable effort will be made to cooperate with the construction process.

.4 The Owner may modify proposed scheduling where such changes are in the best interests regarding the operation of the existing building.

1.5 GENERAL REQUIREMENTS FOR PROJECT MEETINGS

.1 Schedule and administer project meetings in consultation with Consultant, throughout the progress of the Work.

.2 Prepare agenda for meetings.

.3 Distribute written notice of each meeting 4 days in advance of meeting date to Consultant and Owner.

.4 Provide physical space and make arrangements for meetings.

.5 Preside at meetings.

.6 Record the minutes. Include significant proceedings and decisions. Identify action by the parties.

.7 Reproduce and distribute copies of minutes within 5 days after meeting and transmit to meeting participants, affected parties not in attendance, the Consultant, and the Owner.

.8 Representative of Contractor, Subcontractor, and suppliers attending meetings shall be qualified and authorized to act on behalf of the party each represents.

.9 Schedule meetings at regular 14 day intervals, on a day that is determined as convenient by Contractor and Consultant.

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1.6 PRE-CONSTRUCTION MEETING

.1 Within 15 days after award of Contract, request a meeting with the Owner to discuss and resolve administrative procedures and responsibilities.

.2 Conduct meetings with Subcontractors and Suppliers to discuss and resolve administrative procedures and responsibilities.

.3 Owner, Consultant, Contractor, major Subcontractors, field inspectors and supervisors will be in attendance.

.4 Establish time and location of meeting and notify parties concerned a minimum of 5 days before meeting date.

.5 Incorporate mutually agreed variations to Contract Documents into Agreement, prior to signing.

.6 Pre-construction Meeting Agenda: include the following:

- .1 Appointment of official representative of participants in the Work;
- .2 Schedule of Work, progress scheduling;
- .3 Schedule of submissions of shop drawings, samples, colour chips;
- .4 Requirements for temporary facilities, site sign, offices, storage sheds, utilities, fences;
- .5 Delivery schedule of specified equipment;
- .6 Site security;
- .7 Proposed changes, change orders, procedures, approvals required, mark-up percentages permitted, time extensions, overtime, administrative requirements;
- .8 Owner provided products;
- .9 Record drawings;
- .10 Maintenance manuals;
- .11 Take-over procedures, acceptance, warranties;
- .12 Monthly progress claims, administrative procedures, photographs, holdbacks;
- .13 Appointment of inspection and testing agencies or firms;
- .14 Insurances, transcripts of policies.

1.7 PREINSTALLATION MEETINGS

.1 During the course of the Work, schedule preinstallation meetings as required by the Contract Documents.

.2 Wherever possible, schedule preinstallation meetings on the same date as regularly scheduled progress meetings.

.3 The Contractor, affected Subcontractors and Suppliers, manufacturer's representatives, field inspectors and supervisors, the Consultant and any other specified parties are to be in attendance.

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.4 Preinstallation Meeting Agenda: include the following:

.1 Review of existing conditions and affected parts of the Work, and any testing thereof;
.2 Review of installation procedures and requirements;
.3 Review of environmental and field condition requirements;
.4 Schedule of the applicable parts of the Work;
.5 Schedule of submission for samples and other items requiring Consultant's selection;
.6 Requirements for Temporary Work;
.7 Requirements for notification for reviews. Allow a minimum of 48 hours notice for Consultant to review the affected parts of the Work;
.8 Requirements for inspections and tests as applicable. Schedule and undertake inspections and tests;
.9 Delivery schedule for Products; and
.10 Special safety requirements and procedures.

1.8 PROGRESS AND PROGRESS DRAW MEETINGS

.1 During course of the Work and 2 weeks prior to completion of the Contract, schedule progress meetings biweekly.

.2 During course of the Work, schedule progress draw meetings monthly.

.3 Submit to Consultant a copy of the application for payment not less than two Working Days before scheduled progress draw meeting. Consultant may require changes to the application for payment prior to progress draw meeting.

.4 Contractor, major Subcontractors involved in Work, Consultant, and Owner are to be in attendance.

.5 Progress Meeting Agenda: include the following:

.1 Review, approval of minutes of previous meeting;
.2 Review of Work progress since previous meeting;
.3 Field observations, problems, conflicts;
.4 Problems impeding construction schedule;
.5 Review of off-site fabrication delivery schedules;
.6 Corrective measuring and procedures to regain project schedule;
.7 Revision of construction schedule;
.8 Progress, schedule, during succeeding work period;
.9 Review submittal schedules, record drawings: expedite as required;
.10 Maintenance of quality standards;
.11 Review of proposed changes for affect on construction schedule and on completion date;
.12 Other business.

END OF SECTION

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Part 1 General

1.1 SECTION INCLUDES

.1 Shop drawings and product data.

.2 Samples and mock ups.

1.2 SHOP DRAWINGS

.1 Submit to Architect, for review, shop drawings, product data and samples specified.

.2 Until submission is reviewed, work involving relevant product must not proceed.

1.3 RELATED SECTIONS

.1 Section 13 05 41 - Seismic Restraint for Non-structural Components.

1.4 REFERENCES

.1 PDSB - Stipulated Price Contract, 2011.

1.5 SHOP DRAWINGS AND PRODUCT DATA

.1 The term "shop drawings" means drawings, diagrams, illustrations, schedules, performance charts, brochures and other data which are to be provided by Contractor to illustrate details of a portion of Work.

.2 Drawings to be originals prepared by Contractor, Subcontractor, Supplier or Distributor, which illustrate appropriate portion of work; showing fabrication, layout, setting or erection details as specified in appropriate Sections.

.3 Identify details by reference to sheet and detail numbers shown on Contract Drawings.

.4 Maximum sheet size 606 x 909 mm.

.5 Reproductions for submissions: opaque diazo prints.

1.6 PROJECT DATA

.1 Certain specification Sections specify that manufacturer's standard schematic drawings, catalogue sheets, diagrams schedules, performance charts, illustrations and other standard descriptive data will be accepted in lieu of shop drawings.

.2 Above will only be accepted if they conform to following:

.1 Delete information which is not applicable to project.

.2 Supplement standard information to provide additional information applicable to project.

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.3 Show dimensions and clearances required.

.4 Show performance characteristics and capacities.

.5 Show wiring diagrams (when requested) and controls.

1.7 COORDINATION OF SUBMISSIONS

.1 Review shop drawings, product data and samples prior to submission.

.2 Verify:

.1 Field measurements.

.2 Field construction criteria.

.3 Catalogue numbers and similar data.

.3 Co-ordinate each submission with requirement of work and Contract documents. Individual shop drawings will not be reviewed until all related drawings are available.

.4 Contractor's responsibility for errors and omissions in submission is not relieved by Architect's review of submittals.

.5 Contractor's responsibility for deviations in submission from requirements of Contract documents is not relieved by Architect's review of submission, unless Architect gives written acceptance of specified deviations.

.6 Notify Architect, in writing at time of submission, of deviations from requirements of Contract documents.

.7 After Architect's review, distribute copies.

1.8 SUBMISSION REQUIREMENTS

.1 Schedule submissions at least fourteen (14) days before dates that reviewed submissions will be required to be returned.

.2 Submit one reproducible transparency, plus six (6) opaque diazo copies of shop drawings, product data to Architect for review.

.3 Accompany submissions with transmittal letter, in duplicate, containing:

.1 Date.

.2 Project title and number.

.3 Contractor's name and address.

.4 Number of each shop drawing, product data and sample submitted.

.5 Other pertinent data.

.4 Submissions must include:

.1 Date and revision dates.

.2 Project title and number.

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.3 Name of:

.1 Contractor.

.2 Subcontractor.

.3 Supplier.

.4 Manufacturer.

.5 Separate detailer when pertinent.

.5 Identification of product or material:

.1 Relation to adjacent structure or materials.

.2 Field dimensions, clearly identified as such.

.3 Specification Section number.

.4 Applicable standards, such as CSA or CGSB numbers.

.5 Contractor's stamp, initialed or signed, certifying review of submission, verification of field measurements and compliance with Contract documents

1.9 INTERFERENCE DRAWINGS

.1 Prepare interference drawings for all work in confined space: all typical ceiling space conditions and atypical conditions. Coordinate with all trades.

.2 Submit as shop drawings in advance of fabrication or installation of components. Site conditions requiring corrections, due to failure to provide interference drawings as required will be corrected at no additional cost to the owner.

.3 Ceiling heights and bulkheads will not be revised during construction due to failure to prepare interference drawings.

1.10 SHORING DESIGN DRAWINGS

.1 If required as part of this project, or due to construction sequence, it is the contractor’s responsibility to provide in advance of any work requiring shoring, detailed Shoring design drawings bearing the seal of a Professional engineer registered in the Province of Ontario and also a Method Statement describing the work sequence.

.2 Submit to the Consultants as shop drawings in advance of the work.

1.11 SHOP DRAWINGS BEARING THE SEAL OF A PROFESSIONAL ENGINEERS

.1 In addition to any the similar requirements for shop drawings of any mechanical or electrical systems, Shop Drawings for all structural components or components required to perform in conjunction with other structural or building envelope components, cladding and the like shall bear the seal of a professional engineer licensed in the Province of Ontario.

.2 In addition, all components to be attached to or suspended from the walls and ceiling areas shall also bear the seal of a professional engineer licensed in the Province of Ontario. This shall include but not be limited to the following:

.1 Stage drapery and rigging

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.2 Stage lighting system

.3 Gymnasium equipment such as basketball backstops

.4 Projection screen supports

1.12 LIST OF SAMPLE OR MOCK-UP SUBMITALS

.1 At the outset of the project the contractor shall prepare a comprehensive list of all shop drawings, sample submissions and mock ups required.

.2 For assistance only, the following samples and mock up items to be provided are included but not limited to the list following (note this is not exclusive of data sheets and shop drawings):

.1	04 21 13	Brick Masonry	samples, mock-up (2m x 2m)
.2	04 21 13	Masonry Accessories	samples
.3	04 22 00	Concrete Masonry	samples
.4	06 40 00	Architectural Woodwork	samples (300mm x 300mm)
.5	06 47 00	Plastic Laminates	samples
.6	07 21 13	Board Insulation	samples
.7	07 27 10	Air Barriers	samples
.8	07 41 43	Aluminum Composite Panels & Siding	samples, mock-up (3m x 2m)
.9	07 92 10	Joint Sealing	samples and mock up
.10	08 71 10	Finish Hardware	samples
.11	09 30 13	Ceramic Tiling	samples
.12	09 51 13	Acoustical Panel Ceilings	samples (300 x 300)
.13	09 65 19	Resilient Tile Flooring	samples
.14	09 91 22	Painting	draw downs, mock-up
.15	10 11 25	Manufactured Specialties	samples
.16	10 21 20	Laminated Plastic Toilet Partitions	colour samples

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 DESCRIPTION

.1 This Section outlines the mandatory minimum Health and Safety protocols for all renovation, addition and new school construction Projects where all or a portion of the existing school building remains occupied and in use.

.2 These Health and Safety protocols are mandatory minimum requirements, procedures and standards that the School Board insists are fully complied with by all parties involved with renovation projects.

1.2 RELATED SECTIONS

.1 These specifications apply to all Divisions of this Project specification. It is the responsibility of the Contractor to apply these provisions wherever practical within specification limits to all products and services used on this Project.

.2 The requirements of this Section supersede those of all other specification Sections and Drawings. Where conflicts exist in procedures, methods or materials, they shall immediately be brought to the attention of the Consultant and Board Project Manager. Where clarification is not immediately available, the Contractor shall assume the specifications contained in this Section are a minimum standard and the more stringent specification shall apply.

.3 The Contractor must receive approval from Board Project Manager for any deviations from this specification Section.

.4 The General Contractor shall recognize that it is *he* who is the Constructor of the Project. The General Contractor shall also recognize that he is solely responsible for site safety at the Place of the Work and compliance with the requirements of this Section does not limit or remove his total responsibility for site safety as Constructor of the Project.

1.3 REFERENCES

.1 Applicable related regulations, standards and laws related to safety include but are not limited to:

.1 Canada Labour Code, Part 2, Canada Occupational Safety and Health Regulations.

.2 Health Canada/Workplace Hazardous Materials Information System (WHMIS).

.1 Material Safety Data Sheets (MSDS).

.3 Province of Ontario

1. Occupational Health and Safety Act and Regulations for Construction Projects, R.S.O. 1990 June 2002.

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1.4 COMPLIANCE SPECIFICATION

.1 Notwithstanding the requirements of this Section, the Contractor must comply with all applicable health, safety and environmental regulations and statutes.

1.5 BEYOND COMPLIANCE SPECIFICATION

.1 These specifications apply in addition to all applicable health, safety and environmental compliance regulations. They are incorporated here to reflect the Board's intention to develop a specification which provides the safest practical procedures and policies for construction project sites that are occupied and in use by staff, students and visitors during the execution of the Construction Contract.

.2 Beyond compliance specifications recognize that performance well beyond the minimum regulatory standard is often desirable, possible and affordable, often with no cost or low cost options. It also recognizes that application methods or protocols may be as important as the material specified. Therefore, these specifications cover both material and methods.

.3 These provisions apply to both indoor and outdoor applications equally.

Part 2 Products

2.1 NOT USED

Part 3 Execution and Compliance Requirements

3.1 APPLICATION OF COMPLIANCE REQUIREMENTS

.1 The articles setout herein are to be applied together as a set of related policies and procedures to achieve a comprehensive Health and Safety working protocol.

.2 The Contractor shall execute all of the procedures and meet all of the requirements set out herein and apply these protocols from the outset of the Construction Phase.

.3 These procedures or requirements are to be maintained for the duration of the Construction Phase. The Contractor shall not discontinue any of the individual procedures or requirements without the prior approval of the Board Project Manager.

3.2 SITE SUPERVISOR (SITE SUPERINTENDENT)

.1 A full-time Site Supervisor (Site Superintendent) is required on site, regardless of the number of active workers on site.

.2 Site Superintendent shall have as a minimum:

.1 Recent, previous experience with renovation or addition projects involving occupied buildings including (but not limited to) school construction, sites with students, tenants, employees, retail customers, pedestrian and vehicular traffic.

.2 Successful completion of a multi-session Supervisor's training course conducted by a recognised Construction Association in Ontario.

.3 Site Superintendent must carry a cell phone at all times during construction with the ability to be reached directly during all work hours and the ability to have voicemail recorded and accessed during all non-work hours including weekends and holidays.

.4 Site Superintendent must have means of live phone or walkie-talkie communication with the site Flagman during all work hours.

.5 Site Superintendent shall not be changed throughout project unless confirmed and approved by the Board Project Manager.

3.3 ONTARIO OCCUPATIONAL HEALTH & SAFETY ACT AND REGULATIONS FOR CONSTRUCTION PROJECTS

.1 General Contractor to comply with the Ontario Occupational Health & Safety Act and Regulations for Construction Projects, latest edition– including all amendments.

.2 Beyond compliance in item .1 above, regardless of the number of labourers active on the Project, the General Contractor shall form a contractors' Health & Safety Committee at the outset of construction. This Committee shall then follow the standard requirements for such a Committee as set out in the *Occupational Health & Safety Act and Regulations for Construction Projects.*

3.4 ON-SITE COMMUNICATIONS

.1 At the outset of the project the General Contractor shall provide to the Board Project Manager all relevant contact information for the Site Superintendent, GC Project Manager and key sub-contractors including names and cell phone numbers.

.2 The General Contractor shall provide at least one "emergency contact" telephone number at which the Contractor's representative can be reached directly during all work hours and have the ability to have voicemail recorded during all non-work hours including weekends and holidays. As outlined below, this may be designated to the Site Superintendent's cell phone number.

.3 Regardless of compliance method for the emergency contact telephone number stated above, the Site Superintendent must carry a cell phone at all times during construction with the ability to be reached directly during all work hours and the ability to have voicemail recorded during all non-work hours including weekends and holidays.

.4 Site Superintendent must have means of live phone or walkie-talkie communication with the site Flagman during all work hours.

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.5 The Contractor is to ensure that the Board Project Manager is immediately apprised of any safety issues as each arises and the related request and/or resolution. The Board Project Manager is responsible for any decisions that have an effect on the contract execution.

.6 Notwithstanding the reporting to the Project Manager noted above the Site Superintendent shall liaise with school principal or designate on all safety related matters as required on a daily basis.

.7 In the event of a safety issue requiring contractual clarification or action (i.e. Change Notice, etc.), the contractor shall ensure that, where applicable, the action is followed up with appropriate documentation.

3.5 FULL-TIME ON-SITE FLAGMEN

.1 A full-time, designated Flagman is required at all vehicular construction entrances. Refer to drawings for the scope and locations.

.2 In the event there is more than one entrance to the hoarded/fenced construction area, there must be a separate Flagman for each entrance.

.3 Flagman may not be same person as Site Superintendent or other construction worker.

.4 Flagman shall not be changed throughout the Project unless confirmed and approved by the Board Project Manager.

.5 Flagman must have means of phone communication with Site Superintendent (phone or walkie-talkie).

.6 The Flagman shall not be designated for any other duties than to act as a Flagman for safety purposes as described herein.

.7 The Flagman shall meet and escort any construction traffic from the site **entrance** into and out of the hoarded/fenced construction area (including through open site areas until entrances to hoarding.

.8 The Flagman shall only open hoarded areas when construction traffic moves through and immediately re-close gates.

.9 The Flagman shall control construction parking at the school site (including vehicles parking or traveling in unauthorized areas).

.10 The location of the Flagman shall be set to ensure the safe guarding of staff, student, and pedestrian traffic.

.11 If not designated on the Contract Documents, the location of the Flagman shall be confirmed with the Board Project Manager and Consultant at the outset of the project and before the placement of hoarding and fencing.

□

.12 Where the Contractor deems it necessary, in order for the Flagman to carry out the required full-time duties, the cost of a temporary shelter shall be included in the Tender Price.

.13 The Flagman shall be properly attired to carry out his duties, including the use of safety equipment (e.g. wear reflective vest, have appropriate traffic hand-held "Stop" sign and have a visible identification tag).

3.6 SITE SAFETY SIGNAGE

.1 Standardised Safety Signage is required at all construction entrances.

.2 If not designated on the Contract Documents, the location of the Safety Signage shall be confirmed with the Board Project Manager and Consultant at the outset of the Project and before the placement of hoarding and fencing.

.3 Safety Signage is to be posted at all street entrances to school site and at each entrance to hoarded/fenced construction area.

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

.5 Access signage text shall include cell phone contact number for Site Superintendent.

.6 Signage posted at gates shall state restrictions on hours of entry and egress as described in the Contract Documents and under no circumstances shall construction traffic be allowed within 30 minutes prior to school start, during recess, lunch break, and 30 minutes after dismissal periods.

3.7 ACCESS/EGRESS CONTROLS

.1 At the outset of the Contract, the General Contractor shall advise all suppliers and subcontractors of the protocols listed herein and of the requirement to contact the Site Superintendent by Cell phone prior to entering the site.

.2 The drivers of all construction vehicles entering the site, including delivery vehicle drivers, are to contact site Superintendent by cell phone prior to entering site; the Site Superintendent shall, in turn, give notice to the Flagman to be aware of the traffic and authorize the Flagman to allow entry of that vehicle.

.3 Vehicular Gates are only for entry and exit of for construction purposes such as construction personnel, Authorities performing inspections, Board representative, delivery personnel, and disposal pickup and ONLY under escort by the Flagman. As such vehicular gates must remain closed and locked at all times and only opened for access/egress under escort by the Flagman, then closed and locked again.

.4 Gates are to be lockable swing gates for vehicles and man gates at all access points to the hoarded/fenced construction area.

□

3.8 CONTRACTOR PARKING

.1 Contractor parking shall be restricted to hoarded areas or designated parking areas only where pre-approved by Board Project Manager and Principal.

.2 Contractor parking is restricted from all off-site street areas that interfere with site specific parent drop-off and parking areas.

3.9 REQUIRED PRE-CONSTRUCTION MEETINGS

.1 Meeting 1: Contractor shall receive approval from the Architect and the Board Project Manager for parking, vehicular movement, access/egress strategies at a Pre-construction meeting taking place in advance of mobilizing on site.

.2 Meeting 2: Once hoarding and fencing is erected BEFORE site construction is fully active and vehicles or equipment is mobilized on site, an initial site meeting shall take place at which time the layout of trailers and staging, deliveries, storage of materials, parking areas and vehicular movement to be reviewed and approved by the Board Project Manager.

.3 See article *3.12- 'Site Meetings'* following.

3.10 CONSTRUCTION FENCING AND HOARDING

.1 Construction hoarding requirements shall be a site based decision to be determined by the Architect and the Board Project Manager at the design stage and shown on Contract Documents.

.2 No fencing or hoarding shall be less than a continuous 1800 mm high.

.3 In portions of the site where chain link is approved, it shall be continuous 1800 mm high chain link fencing, wire-tied to staked iron 'tees' at 1800 mm on centre - OR - leased, modular 'quick fencing' if staked down and wire tied together.

.4 All fenced and hoarded areas to be gated with lockable vehicular and man gates-minimum construction to be steel rail and chain link construction.

.5 Plastic snow fencing is NOT permitted.

.6 All hoarding and fencing shall be maintained in a stable condition, for duration of construction period as part of the base contract price and to include Superintendent's inspection at the beginning and end of each work day.

.7 All Fire Routes to be outside all fenced and hoarded areas and maintained clear at all times.

.8 'Covered way' protection shall be provided when accesses or pathways are in proximity to construction, in accordance with Ministry of Labour *Occupational Health & Safety Act* Regulations.

□

3.11 HEALTH, WELLNESS & SAFETY DEPARTMENT REPRESENTATIVE

.1 A representative of the Board's Health, Wellness & Safety Dept. ('Environment, Health and Safety Officer') may visit site at any anytime throughout the duration of the Contract to review the site, as it relates to the safety of the occupied areas of the site. Such site review shall neither constitute an inspection or approval for the Contractor.

.2 Concerns or issues identified by the representative from the Board's Health, Wellness & Safety Dept. shall be communicated through the Board Project Manager and the school Principal for corrective action.

.3 Contractor shall ensure full access to all site areas, at all times, for the Board's Health, Wellness & Safety Department Representative.

3.12 SITE MEETINGS

.1 Coordinate the requirements of this Section with *Section 01 22 00 – 'Meetings and Progress Reports'*.

.2 Initial site meeting to take place after erecting fencing and hoarding but prior to the mobilisation of any vehicles, equipment or start of Work.

.3 Contractor shall ensure that the Board Project Manager, School Principal and a representative of the Board's Health, Wellness & Safety Department and the School Principal attend the initial site meeting.

.4 The initial meeting shall review and approve a standardised agenda for all site meetings and a thorough review of the Site Safety Protocol.

.5 The standardised agenda shall include a Checklist and Report of Health and Safety items at the beginning of the agenda. This Checklist shall be included and each item reviewed at all site meetings for the duration of the project.

.6 The Checklist of Site Safety items shall include but not be limited to:

.1 Contractor's report of site safety record and report of recent site activities, precautions or actions.

.2 Review any visits to the site and actions required by Ministry of Labour or Board Health, Wellness & Safety representatives or other Authorities Having Jurisdiction.

.3 Contractor's Health & Safety policy manual posted in site trailer.

.4 Copy of Ministry of Labour *Occupational Health & Safety Act and Regulations for Construction Projects* in site trailer.

.5 Name of General Contractor H&S representative.

.6 Continuing compliance with Safety Signage.

.7 Hoarding & fencing layout and condition.

.8 Access and egress measures and any breaches of requirements.

□

.9 Confirmation of communications link between Site Superintendent & Flagman.

.10 Work that may produce any noxious odours and the containment measures, (*i.e.*: schedule, type, approvals required therefore).

.11 Copies of Material Safety Data sheets in site trailer.

.12 Complete meeting minutes including details of Safety Checklist shall be copied to Architect, Board Project Manager and Principal.

.7 Contractor to produce record of written Memorandum to all subtrades and suppliers detailing but not limited to: hours of delivery; site access procedures and restrictions; use of existing facilities.

.8 Contractor to prepare detailed and accurate written record of all meetings to be kept and issued to all parties.

3.13 CONTRACTOR'S HEALTH AND SAFETY COMMITTEE MEETINGS

.1 As required in item 3.1.2, the Contractor shall form a Health and Safety Committee, hold meetings and record minutes of meetings for the duration of the Contract.

.2 Contractor to maintain a copy of Health & Safety Committee minutes on site for review by Ministry of Labour or Board representative(s).

END OF SECTION

□

Part 1 General

1.1 SECTION INCLUDES

.1 Health and safety considerations required to ensure due diligence towards health and safety on construction sites, and meets the requirements laid out Occupational Health and Safety - Construction.

1.2 RELATED SECTIONS

.1 These specifications apply to all divisions of this project specification. It is the responsibility of the Contractor to apply these provisions wherever practical within specification limits to all products and services used on this project.

.2 Recognized that currently specified materials and methods may conflict with the basic intention of this section. Where reasonable alternate materials and methods exist that are not specified here, and that do not compromise quality or create additional cost for the Owner, notify the Consultant of such alternate materials or methods. Do not proceed to use alternate materials or methods to those specified without the express approval of the Consultant.

.3 Elsewhere, apply the provisions of this section to all work. Exceptions can only be made when signed off by the Consultant. Suitability of all products used is the responsibility of the Contractor.

1.3 REFERENCES

.1 Canada Labour Code, Part 2, Canada Occupational Safety and Health Regulations.

.2 Health Canada/Workplace Hazardous Materials Information System (WHMIS).

.1 Material Safety Data Sheets (MSDS).

.3 Province of Ontario

.1 Occupational Health and Safety Act and Regulations for Construction Projects, R.S.O. [1990 June 2002].

1.4 COMPLIANCE SPECIFICATION

.1 The Contractor must comply with all applicable health, safety and environmental regulations.

1.5 BEYOND COMPLIANCE SPECIFICATION

.1 These specifications apply in addition to all applicable health, safety and environmental compliance regulations. They are incorporated here to reflect the Owner’s intention to develop a specification which maximizes environmentally “friendly” materials and methods wherever possible within current technical and budget limitations.

□

.2 Beyond compliance specifications recognize that performance well beyond the minimum regulatory standard is often desirable, possible and affordable, often with no cost or low cost options. It also recognizes that application methods or protocols may be as important as the material specified. Therefore these specifications cover both material and methods.

.3 The primary goal of beyond compliance specification is to reduce the use of products or methods which have negative health and environmental impacts both during and after construction. These considerations may include full life cycle impacts, associated with raw materials, manufacturing, transport, deconstruction and their eventual fate.

.4 These specifications will specifically address primary categories of readily identifiable products, ingredients and methods.

.5 These provisions apply to both indoor and outdoor applications equally.

1.6 EXCEPTIONS

.1 These specifications recognize that not all substitutes are equal and therefore exceptions can be made based on substantive evidence of necessary and superior performance. Special considerations may be given to restricted substances when secondary provisions are made such as sealed in place (contained) applications. All such exceptions must be approved in writing by the Consultant.

1.7 PRODUCTS OR SUBSTANCES TO BE AVOIDED OR LIMITED IN USE

.1 No product containing the following substances may be used on this project when an equivalent product without or with a lower concentration of this substance is suitable and available. All products containing substances which are known to cause health effects including but not limited to cancer, mutagenic, neurological, or behavioral effects should be avoided if suitable substitutes not containing or containing lower concentrations are available. This provision shall be limited to information contained on Material Safety Data Sheets, therefore MSDS sheets must be reviewed for all products for which such sheets are required. Applications for exceptions must be accompanied by related MSDS and product application and performance sheets, clearly showing a need for the exception.

1.8 VOLATILE ORGANIC COMPOUNDS

.1 No product containing volatile organic compounds (in over simplified terms volatile petro chemical or similar plant derived solvents) may be used on this project when a suitable non VOC or failing that a low VOC substitute is available. Manufacturers may refer to the U.S. EPA definition of VOC's for guidance or alternatively use the low molecular weight organic compound descriptor.

.1 Example: Paints, Coatings, Primer, Adhesives, Chalks, Firestops, etc.

.2 Waterborne equivalents are available for most of the solvent borne products used in construction and in most cases would be the preferred alternative. Waterborne products may in some instances have high VOC contents; therefore the fact that a product is waterborne does not automatically make it acceptable.

1.9 CHLORINATED SUBSTANCES

.1 Poly Vinyl Chloride (vinyl) and other chlorinated products should be avoided if suitable substitutes are available.

1.10 PLASTICIZERS

.1 Plasticizers which off-gas (low molecular weight) should be avoided.

1.11 MAN MADE MINERAL FIBRES

.1 Products containing mineral fibres which can be emitted or abraded should be avoided.

.1 Examples: duct liner, mineral fibre ceiling tiles, etc.

1.12 RADIATION

.1 Products or methods which result in the lowest emission of Electro Magnetic Fields are preferred.

1.13 BIOCIDES

.1 Products containing biocides (pesticides, miticides, mildeweides. fungicides, rodenticides, etc.) are not to be used if suitable alternatives are available. Highly stable, low human toxicity biocides such as Portercept may be acceptable substitutes. Biocide formulas which break down, emit powders of offgass should be avoided.

1.14 HEAVY METALS

.1 Heavy metals such as lead, cadmium, mercury etc. should be avoided.

1.15 ALUMINUM

.1 Raw aluminum should be avoided, anodized or factory painted aluminum is acceptable. This is particularly applicable to surfaces which people can touch.

1.16 OZONE DEPLETING SUBSTANCES

.1 Products which contain or which use Ozone Depleting Substances such as Bromide, Chlorofluorocarbons (CFC) or Hydrofluorocarbons (HFC) etc. should be avoided if suitable substitutes are available.

1.17 GREENHOUSE GASES

.1 Products which contain, use or generate Greenhouse gasses such as CO2 should be avoided if suitable substitutes are available.

1.18 BITUMINOUS (Tar) PRODUCTS

.1 Products containing tar compounds should not be used if suitable substitutes are available.

□

1.19 CHEMICAL COMPOUNDS

.1 Products containing the following chemical compounds should not be used if suitable substitutes are available: Neoprene, Latex, Butyl, ABS, and Formaldehyde.

1.20 ADHESIVES

.1 Adhesives containing solvents or other non preferred ingredients should be avoided if suitable substitutes are available, including systems designs which do not need adhesives or can use mechanical etc. fastening alternatives

1.21 COMPOSITE PRODUCTS

.1 Some composite products contain adhesives such as formaldehyde which are not preferred, and some composites such as Fibre Reinforced Plastics are not practical for recycling. These products should be avoided if suitable substitutes are available.

1.22 CLEANERS AND SOLVENTS

.1 Products, equipment, and methods which require the use of cleaners and solvents are not preferred if suitable substitutes are available. Examples of preferred products would include No Wax floors, or primerless caulks and adhesives, or products not requiring caulks and adhesives.

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 FIRES

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

1.2 DISPOSAL OF WASTES

.1 Do not bury rubbish and waste materials on site.

.2 Do not dispose of waste or volatile materials, such as mineral spirits, oil or paint thinner into waterways, storm or sanitary sewers.

1.3 DRAINAGE

.1 Refer also to Section 31 23 10.

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

.3 Do not pump water containing suspended materials into waterways, sewer or drainage systems.

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

1.4 SITE CLEARING AND PLANT PROTECTION

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

.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. Avoid unnecessary traffic, dumping and storage of materials over root zones.

.4 Restrict tree removal to areas indicated or designated by Engineer.

1.5 POLLUTION CONTROL

.1 Maintain temporary erosion and pollution control features installed under previous contract and to be provided new under this contract and as requested by local Municipal and Regional Authorities.

.2 Install, maintain, restore, replace sediment control fence as required by Municipal and Regional authorities. The fence shall be in accordance with Municipal standards.

3. Install, maintain, restore, replace roadside catchbasin sediment protection at all street catch basin in accordance with Municipal standards.

□

.3 Install, maintain, restore, replace catchbasin sediment barrier immediately after installation of catch basins on the property in accordance with Municipal Standards.

.4 A temporary mud mat has been installed under the previous grading contract and remains for removal under this contract. As part of this contract, include in the tender amount the supplementary stone required for maintenance and the removal of the mud mat consisting of 30m x 5m x 0.45m clear stone at any construction entrance. This is required whether or not such mud mat is shown on drawings or remains evident on site.

.5 Control emissions from equipment and plant to local authorities emission requirements.

.6 Prevent sandblasting and other extraneous materials from contaminating air beyond application area, by providing temporary enclosures.

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

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 and testing, administrative and enforcement requirements.

.2 Tests and mix designs.

.3 Mock-ups.

.4 Mill tests.

.5 Equipment and system adjust and balance.

1.2 PRECEDENCE

.1 For Federal Government projects, Division 1 Sections take precedence over technical specification sections in other Divisions of this Project Manual.

1.3 RELATED SECTIONS

.1 Section 1 33 00 - Submittal Procedures.

.2 Section 01 78 00 - Closeout Submittals.

.3 Section 01 11 00, article 1.12 – Quality Control

1.4 REFERENCES

.1 Canadian Construction Documents Committee (CCDC)

.1 CCDC 2- 2008 Stipulated Price Contract.

1.5 INSPECTION

.1 General: Materials and workmanship shall be subject to inspection at any time. Cooperate in permitting access for inspection to all places where work is being done or stock is being stored.

.2 Owner's quality control inspection and testing is specified in the technical sections and will be paid from Cash Allowance except as otherwise specified. Contractor to be responsible to pay for inspections and retesting to verify acceptability of work requiring correction.

.3 Allow 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.

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

□

.5 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.

.6 Consultant may order any 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.

1.6 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.

1.7 PROCEDURES

.1 Notify appropriate agency Consultant 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 an orderly sequence so as not to cause delay in Work.

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

1.8 REJECTED WORK

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

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

1.9 TESTS AND MIX DESIGNS

.1 Furnish test results and mix designs as may be requested.

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

.3 Allow sufficient time for testing, evaluation, alterations and retesting so as not to interrupt the Progress Schedule for the Project.

.4 The Consultant may require testing of connections and special prefabricated inserts, as part of the work of this Section.

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1.10 MOCK-UPS

.1 Refer to partial list of mock ups in Section 01 33 00 - Submittal Procedures

.2 Prepare mock-ups for Work specifically requested in specifications. Include for Work of all Sections required to provide mock-ups.

.3 Construct in all locations acceptable to Consultant.

.4 Prepare mock-ups for Consultant's review with reasonable promptness and in an orderly sequence, so as not to cause any delay in Work.

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

.6 If requested, Consultant will assist in preparing a schedule fixing dates for preparation.

.7 Remove mock-up at conclusion of Work or when acceptable to Consultant.

.8 Mock-ups may remain as part of Work only if previously agreed to by consultant and accepted as acceptable quality upon completion..

.9 Specification section identifies whether mock-up may remain as part of Work or if it is to be removed and when.

1.11 MILL TESTS

.1 Submit mill test certificates as required of specification Sections.

1.12 EQUIPMENT AND SYSTEMS

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

1.13 SEALANTS

.1 Refer also to Section 07 92 10.

.2 Sealants used for the various building envelope assemblies shall be selected from those specified in the respective assembly Section, and shall be coordinated with the sealant being provided under other building envelope Sections. Preferably, one sealant by the same manufacturer shall be used throughout. If different sealants are selected, from those specified, it is the responsibility of the respective Section to ensure compatibility between selected sealant, substrates, and sealants of other Sections which come in contact with the selected sealant.

□

Part 2 Products

2.1 NOT USED

.1 Not Used.

Part 3 Execution

3.1 NOT USED

.1 Not Used.

END OF SECTION

□

Date: March 2026

Project: NE Oakville #3 - Halton Catholic District School Board

Project No: 2549-01176-00

Architect: Hossack & Associates Architects

Consulting Structural Engineer: Salas O'Brien Canada Inc.

PART 1 - INTRODUCTION

1.1 General

.1 The following are the terms of reference for the inspection and testing of items listed below:

Strip and Spread Footings
Cast-in-Place Concrete
Structural Precast Concrete
Structural Steel
Steel Deck
Glued Laminated Timber
Masonry and Masonry Reinforcement
Excavation and Backfilling
Caissons

.2 The inspection and testing is to be performed by one or more Independent Inspection and Testing Companies.

1.2 Objective

.1 The objective is to inspect, sample, and test a sufficient number of members, details and procedures, and a sufficient quantity of material, to determine if the structural work is proceeding generally in accordance with the contract documents.

1.3 Execution

.1 Carry out inspection, sampling, and testing in accordance with the 2024 Ontario Building Code and all applicable acts, standard procedures, and by-laws of any authority having jurisdiction.

.2 When standard procedures do not exist, submit, for review by the Engineer, well ahead of the time at which it will be required, a detailed procedure indicating inspection sampling and testing methods, acceptance criteria, and report format.

.3 Employ inspection and testing personnel fully qualified for such work, as per the Ontario Building Code and all applicable acts, standard procedures, and by-laws of any authority having jurisdiction.

.4 Items, which in our opinion require special attention, are listed in the Detailed Requirements, together with a recommended minimum degree of inspection. In general, inspect, sample, and test the first of each element, operation, and material quantity. Where elements, operations, and material repeat, inspect, sample, and test a percentage of each during the course of the work. Where minimum percentages are not specifically listed herein, inspect, sample, and test at least 10%.

.5 The detailed requirements of inspection and testing will be reviewed and refined jointly by the inspection company and the Engineer in close cooperation with the Project Manager, and the Architect at regular intervals to coordinate with the finally adopted fabrication and erection procedures, and the construction schedule.

.6 Regularly evaluate the extent of your inspection and testing to determine that it is achieving the objective. Report to the Engineer with a copy to the Project Manager, and Architect if you deem further inspection and testing is necessary and make recommendations.

1.4 Defects and Deficiencies

.1 When defects or deficiencies are noted, inspect, sample, and test the remedial action and review successive similar elements, operations, and material until you are satisfied the defect or deficiency is not recurring; then progressively revert to the original percentage or frequency of review.

.2 Keep separate, accurate records of dates, time and expenses related to re-inspection, re-sampling, and re-testing of elements, material and procedures. When requested by the Architect prepare a report identifying such costs in detail.

1.5 Contractor's Quality Control

.1 This inspection and testing is not intended to serve as any part of the Contractor's quality control. The inspection and testing company is responsible to the Architect and shall take instructions only from the Architect, or the Engineer.

.2 The specifications state that the cost of additional inspection and testing made necessary by repeated deficiencies or defects in the materials or work will be charged to the Contractor.

PART 2 - QUALIFICATIONS

2.1 Companies to be considered shall have the following qualifications where applicable:

.1 Certification to CSA A283 Qualification Code for Concrete Testing Laboratories, Category 2.

.2 Certification to CSA W178.1 and W178.2 with respect to company, personnel, equipment and procedures for applicable requirements.

2.2 All technicians carrying out non-destructive testing shall be C.G.S.B. Level 2 certified.

2.3 All field technicians performing concrete testing must be certified under CSA A283.

2.4 Be in a position to assemble the necessary experienced staff to carry out the specified work as required by the fabrication and erection schedule.

2.5 Submit with your proposal the following data:

.1 Statements covering the qualification requirements for your firm and individuals assigned to this project.

.2 Set-up of organization as it pertains to this project.

.3 Names and experience of the key inspectors.

.4 A sample of the standard checklists used by your inspectors for shop and field inspection and testing of the applicable work.

PART 3 - PROPOSAL

3.1 Submit a proposal to the Owner with a copy to the Architect and Engineer containing the following:

.1 Schedule of rates.

.2 Estimate of manpower involvement and overall cost estimate based on these terms of reference.

.3 It may be necessary to institute an accelerated program to facilitate early stripping of concrete. Make detailed proposals for such a program with separate cost estimate.

.4 Unit rates for the following:

1. Inspector time on site (includes review of contract documents and preparing hand-written report to be left on site) $ /hr.

2.	Inspector travel time (not to be included in item 1)	$	/hr.
3.	Vehicle travel cost - firm price	$	/km $ /trip
4.	Written report - firm price (includes typing and issuance)	$	/report
5.	Concrete cylinder costs	$	/set of 3
6.	Any additional staff or activities applicable and respective rates		

PART 4 - DOCUMENTS

4.1 Contract Documents

.1 Obtain from the Architect the latest relevant contract documents including drawings and specifications.

.2 Thoroughly familiarize yourself with latest contract documents.

4.2 Geotechnical Investigation Reports

.1 Obtain from the Architect all relevant geotechnical reports, letters and the like, on which the final building design is based.

.2 Thoroughly review these reports, letters, etc.

.3 Include in the proposal, an amount for reviewing these reports, completed foundation drawings and related specification clauses, to ensure that recommendations made in the reports are consistent with the available geotechnical information (i.e. boreholes, tests, etc.). In addition, ensure that the geotechnical report recommendations have been properly interpreted and have been incorporated into the contract documents. NOTE: The successful geotechnical inspection and testing firm will be required to submit a written summary of their comments upon completion of the above noted contract document review. In addition, they will be required to submit a summary of any comments they may have on the contents and recommendations contained in the original geotechnical report.

4.3 Construction Information

.1 Obtain, prior to submitting your proposal, the following from the Contractor:

.2 Construction, fabrication and erection schedule.

.3 Material quantities.

.4 Obtain the following from the Contractor at appropriate times during the construction:

.5 A set of fabrication, setting and erection drawings identified as being a true copy of the drawings bearing the Stephenson Engineering "Reviewed" stamp.

.6 Mill test certificates.

.7 Erection procedures for major elements, including details of temporary shoring and guying of the structure.

PART 5 - GENERAL PROCEDURES

5.1 Examine the proposed construction schedule together with the Owner and Contractor and estimate the appropriate number of site visits accordingly.

5.2 Establish a procedure with the Contractor whereby you are notified in advance when fabrication and erection will commence. Maintain close contact with the Contractor to ensure that the inspection of designated items is not missed.

5.3 Conform to the attached Detailed Requirements. Base inspection and testing on the contract drawings and specifications and reviewed shop and erection drawings bearing the Stephenson Engineering stamp.

5.4 Except as herein noted otherwise, examine materials and procedures on a sampling basis to satisfy yourselves that the Contractor is, in general, complying with the contract requirements.

5.5 Reports

.1 Report immediately to the Architect by telephone, any deviation from the contract documents, giving any recommendations for further testing deemed necessary. No modifications are to be made or instructions given without prior approval of the Engineer.

.2 Issue written inspection reports addressed to the Architect within five (5) working days of the inspection.

.3 Concrete test reports must be issued within five (5) working days of the test.

.4 Among the other routine data, state in the inspection report the exact gridline, location, level and marks of the members which were checked and all details regarding these members that were examined. It is suggested that a tabular system be used for summarizing the inspection.

.5 At the beginning of each report, state whether the contract requirements have been met, and list separately members or conditions not meeting requirements. State the seriousness of these infractions.

.6 Issue a final report, signed by a Professional Engineer licensed in the Province of Ontario, at the end of the applicable phases of work, summarizing previous intermediate reports and signifying that you have complied with these terms of reference and are satisfied that work has been completed in general conformity with the contract documents, applicable codes and standards and reviewed shop drawings.

.7 Keep the Contractor and Architect informed of the results of all inspections and tests.

5.6 Report Distribution

.1 Address reports to the Architect and distribute as follows:

FIRM	COPIES
Owner	1
Architect	1
Chief Building Official	1
Salas O'Brien Canada Inc.	1
Contractor	1

5.7 Invoices

.1 Submit invoices monthly or as per agreed procedure between Inspection Company and the Owner.

.2 Submit the following with your monthly invoices:

.3 A detailed breakdown of all time spent and costs incurred during the billing period. This breakdown should include the number of site/shop visits, the number of concrete cylinder tests performed, the number of hours spent reviewing reinforcement on site and the like.

.4 A recapitulation of the total costs incurred to date, related to the progress (percentage of work completed).

.5 Inform the Owner, Architect and the Engineer, in writing, as soon as possible, when expenditures have reached 50% and 85% of the estimate and/or if it appears that the costs of required testing and inspection may exceed the estimate.

END OF SECTION 01 45 23

Part 1 General

1.1 SECTION INCLUDES

.1 Temporary utilities.

1.2 RELATED SECTIONS

.1 Section 01 52 00 - Construction Facilities.

.2 Section 01 56 00 – Temporary Barriers and Enclosures.

1.3 INSTALLATION AND REMOVAL

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

.2 Remove from site all such work after use.

1.4 DEWATERING

.1 Refer also to Sections 31 23 10 and 01 35 43.

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

1.5 WATER SUPPLY

.1 Arrange, pay for and maintain temporary water supply in accordance with governing regulations and ordinances. Provide for water as require whether available in the vicinity of the site or not.

1.6 TEMPORARY HEATING AND VENTILATION

.1 Pay for cost of temporary heat and ventilation used during construction, including costs of installation, fuel, operation, maintenance and removal of equipment. Use of direct-fired heaters discharging waste products into work areas will not be permitted unless prior approvals given by the Architect.

.2 Furnish and install 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 for storage, installation, curing of materials.

.5 Provide adequate ventilation to meet health regulations for safe working environment.

□

.3 Maintain minimum temperature of 10 degrees C or higher where specified as soon as finishing work is commenced and maintained until acceptance of structure by Engineer.

.4 Ventilating:

.1 Prevent hazardous 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 inharmful 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 elements.

.5 Maintain strict supervision of operation of temporary heating and ventilating equipment to:

.1 Conform with applicable codes and standards.

.2 Enforce safe practices.

.3 Prevent abuse of services.

.4 Prevent damage to finishes.

.5 Vent direct -fired combustion units to outside.

.6 The Architect may permit the use of permanent system providing agreement can be reached on:

.1 Conditions of use, special equipment, protection and maintenance.

.2 Guarantees will not be affected.

.3 Approval of the Owner.

7. Refer to Section 011100, item 1.30. ‘Periodic Cleaning’ for replacement of filters at time of final acceptance of work.

8. Contractor is to provide all temporary utilities, winter heating, frost breaking and inclement weather protection as required to ensure completion date delivery.

1.7 TEMPORARY COMMUNICATION FACILITIES

.1 For duration of contract until final permanent lines are installed, provide and pay for temporary telephone and fax hook up, lines and equipment necessary for own use and use of Consultant.

.2 Immediately upon award of contract, arrange for temporary Bell telephone line to be connected to the site trailer for purposes of providing functional communication equipment listed above.

□

1.8 FIRE PROTECTION

.1 Provide and maintain temporary fire protection equipment during performance of Work required by [insurance companies having jurisdiction] [and] governing codes, regulations and bylaws.

.2 Burning rubbish and construction waste materials is not permitted on site.

1.9 POWER

.1 During the tender period, determine if power will be available in the vicinity of the project site. If no power is deemed available, include costs for generation of power required to carry out the work for the duration required to complete the Project. The Board will not consider payment of generated power.

.2 It is expected that power may not be available to the project site at the onset of the project. The contractor is to include costs for the generation of power, or arrange for the provision of temporary power as required to carry out the work for the duration required to complete the Project

.3 Arrange, pay for and maintain temporary electrical power supply in accordance with governing regulations and ordinances.

.4 Install temporary facilities for power such as pole lines and underground cables to approval of local power supply authority.

.5 Electrical power and lighting systems installed under this Contract may be used for construction requirements with prior approval of Architect, provided that guarantees are not affected. Make good damage. Replace lamps which have been used over period of three (3) months.

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 Office and sheds.

.3 Parking.

.4 Project identification – refer to AD Drawings for jobsite sign.

1.2 RELATED SECTIONS

.1 Section 01 51 00 - Temporary Utilities.

.2 Section 01 56 00 - Temporary Barriers and Enclosures.

1.3 REFERENCES

.1 Canadian Construction Documents Committee (CCDC)

.1 CCDC 2-2008 Stipulated Price Contract.

.2 Canadian General Standards Board (CGSB)

.1 CGSB 1-GP-189M-84, Primer, Alkyd, Wood, Exterior.

.2 CGSB 1.59-97, Alkyd Exterior Gloss Enamel.

.3 Canadian Standards Association (CSA International)

.1 CAN3-A23.1-/A23.2-94, Concrete Materials and Methods for Concrete Construction/Method of Test for Concrete.

.2 CSA-0121-M1978, Douglas Fir Plywood.

.3 CAN/CSA-Z321-96, Signs and Symbols for the Occupational Environment.

1.4 INSTALLATION AND REMOVAL

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

.2 Remove from site all such work after use.

1.5 SCAFFOLDING

.1 All necessary scaffolding shall be provided and constructed according to all by-laws and safety regulations. It shall be removed promptly and completely when no longer required.

.2 As required by Ministry or Labour, design of scaffolding or hoarding shall be by a Professional Engineer.

□

1.6 ACCESS

.1 Provide and maintain adequate access to project site.

.2 The General Contractor for this Work shall, at all times allow the Consultants, the Board, or any other Board commissioned contractor or their employees, access into the building or around the premises, undisturbed, whether union or non-union, as may be required in the execution of other portions of the building work and installation of equipment, etc.

.3 The General Contractor shall cooperate fully with any and all Board commissioned Contractors.

1.7 HOISTING

.1 Provide, operate and maintain hoists & cranes required for moving of workers, materials and equipment. Make financial arrangements with Subcontractors for use thereof.

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

1.8 ELEVATORS

.1 Permanent elevators may not be used by construction personnel for transporting of materials unless coordinated with the Architect or Structural Engineer.

.2 Provide protective coverings for finish surfaces of cars and entrances.

1.9 SITE STORAGE/LOADING

.1 Provide adequate weather tight sheds with raised floors, for storage of materials, tools and equipment which are subject to damage by weather.

1.10 CONSTRUCTION PARKING

.1 Provide, on site, sufficient temporary parking.

1.11 OFFICES

.1 Provide office heated to 22 degrees Celsius, lighted 750 Lx and ventilated, of sufficient size to accommodate site meetings and furnished with drawing lay down table, telephone, and facsimile machine. Pay telephone not acceptable.

.2 Maintain in clean condition.

.3 Provide and maintain in clean condition: two separate plans layout tables, minimum 1200 x 1800 mm each. One table shall be used by the General Contractor and subcontractors at their discretion. The second shall be provided for use by subcontractors and by the consultant or Inspection and Testing Companies during site visits or project meetings.

□

1.12 EQUIPMENT, TOOL AND MATERIALS 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.

1.13 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.

.3 When permanent water and drain connections are completed, provide temporary water closets and urinals complete with temporary enclosures, inside building. Permanent facilities may be used on approval or Architect.

1.14 JOBSITE SIGN

.1 Supply and erect a sign (W.P. Plywood Signboard) as shown on AD Detail Sheets

.2 Construct plumb and level in neat wood framework and securely anchored in ground by posts to withstand wind pressure of 160 km/h.

.3 Provide shop drawing of layout.

.4 Supply of painted sign only shall be paid from Cash Allowance. Contractor is responsible for supply and installation of support framing and foundation connection on the site.

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 Traffic Controls.

.3 Fire Routes.

1.2 RELATED SECTIONS

.1 Section 01 51 00 - Temporary Utilities.

.2 Section 01 52 00 - Construction Facilities.

.3 Section 01 11 00 - Summary of Work.

1.3 REFERENCES

.1 Canadian General Standards Board (CGSB)

.1 CGSB 1.189M- [84], Primer, Alkyd, Wood, Exterior.
.2 CGSB 1.59- [97], Alkyd Exterior Gloss Enamel.

.2 Canadian Standards Association (CSA International)

.1 CSA-O121- [M1978], Douglas Fir Plywood.

1.4 INSTALLATION AND REMOVAL

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

.2 Remove from site all such work after use.

1.5 SITE ENCLOSURES

.1 Refer to Section 01 11 00- Summary of Work, article 1.6 ‘Construction Fencing’ for clarification of existing fence on site.’ Maintain fences in good repair.

2. Maintain siltation control fencing as part of site enclosure, as indicated in Section 01 35 43, and/or required Municipal or Regional authorities. Maintain/restore/replace siltation control fencing as directed throughout the construction period to ensure proper function.

1.6 WEATHER ENCLOSURES

.1 Provide temporary weathertight enclosures protection for exterior openings until permanently enclosed.

.2 Erect enclosures to allow access for installation of materials and working inside enclosure.

□

.3 Design enclosures to withstand wind pressure.

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

1.7 DUST TIGHT SCREENS

.1 Provide dust tight screens or insulated partitions as required 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.

1.8 ACCESS TO SITE

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

1.9 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.

1.10 FIRE ROUTES

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

1.11 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.

1.12 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 5 days prior to installation.

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

1.13 TEMPORARY FENCING TO SODDED AREAS

1. Following the installation of sod to the playfield areas, supply and install temporary, leased Modular (Mod U Lok) 1800 high chain link fencing. Stake with iron “T’s” at minimum 2400 o.c. and maintain for a minimum of 6 weeks while sod is maintained as part of this contract

and is deemed established. Refer to Section 32 92 23 – Sodding and 01 11 00 – Summary of Work.

2. Remove fencing at end of 6 week period.

3. Cost of this temporary fencing shall to be included Tender Price if sod is not installed a minimum of 6 weeks prior to occupancy.

4. If sodding is delayed such that the 6 week period is not completed prior to the end of the sod growing season, Contractor shall be responsible to maintain fence on site, at no additional cost to the owner, until the Spring and the consultant has deemed the sod roots have "knit" and is ready for student play activities.

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.

.2 The responsibilities of this section includes but is not limited to the following item(s), including all related labour and materials necessary to successfully complete the installation of same as detailed on the Drawings.

.3 The cutting, removal and disposal and patching of masonry wall sections in locations of all new electrical panels and for all mechanical ducts passing through masonry walls or walls of any other construction not automatically accommodated in new work by the mason.

.4 The cutting, removal and patching of all penetrations required for mechanical and electrical services through floors, ceilings and walls.

.5 The supply and installation of a Portland cement based leveling skim coat as required to provide an acceptable surface for the installation of new VCT tile to any rooms as described on drawings to receive such flooring.

.6 All other work not listed in other Sections, but detailed on the Drawings.

1.2 RELATED SECTIONS

.1 Section 01 11 00 - Summary of Work.

.2 Section 04 21 13- Brick Masonry

.3 Section 01 33 00 - Submittal Procedures.

.4 Section 08 11 14- Metal Doors and Frames

.5 Section 08 71 15 – Finish Hardware

.6 Section 09 91 22- Painting

.7 Section 09 21 16- Gypsum Board Assemblies

.8 Section 09 51 13- Acoustic Panel Ceilings

.9 Section 10 11 25- Manufactured Specialties

.10 Mechanical and Electrical Sections.

.11 Individual product Sections: cutting and patching incidental to work of section. Advance notification to other sections required.

□

1.3 SUBMITTALS

.1 Submit written request in advance of cutting or alteration which affects:

- .1 Structural integrity of any element of Project.
- .2 Integrity of weather-exposed or moisture-resistant elements.
- .3 Efficiency, maintenance, or safety of any operational element.
- .4 Visual qualities of sight-exposed elements.
- .5 Work of Owner or separate contractor.

.2 Include in request:

- .1 Identification of Project.
- .2 Location and description of affected Work.
- .3 Statement on necessity for cutting or alteration.
- .4 Description of proposed Work, and products to be used.
- .5 Alternatives to cutting and patching.
- .6 Effect on Work of Owner or separate contractor.
- .7 Written permission of affected separate contractor.
- .8 Date and time work will be executed.

1.4 MATERIALS

.1 Required for original installation.

.2 Change in Materials: Submit request for substitution in accordance with Section 01 33 00 - Submittal Procedures.

.3 Concrete lintel block, reinforcing steel and concrete fill for openings if required at new penetrations in walls or steel lintels as may be permitted by consultant.

.4 Portland Cement based Concrete Patching Compound compatible with new slab, precast concrete slabs or other flooring to make good a smooth, suitable surface to accept the direct application of new VCT or resilient sheet flooring.

.5 Portland Cement based Concrete for new floor openings or floor leveling, or patching of floor openings.

.6 All other materials not listed in other Sections, but detailed on the Drawings.

1.5 EXECUTION

.1 The Trades requiring cuts, holes or sleeves for their work shall locate them.

.2 Do not cut, drill or sleeve load-bearing members without obtaining prior written approval from the Consultant for each condition.

.3 Cut holes carefully, leaving holes no longer than required, with clean, true and smooth edges.

□

.4 Fit items to the tolerances established by industry 'Best Practice' standard for applicable type of work.

.5 Make patches undetectable in the finished work. All other work not listed in other Sections, but detailed on the Drawings, is to be done in a professional manner and to the industry 'Best Practice' standard for the described work.

.6 Execute cutting, fitting, and patching including excavation and fill if required, to complete Work.

.7 Fit several parts together, to integrate with other Work.

.8 Uncover Work to install ill-timed Work.

.9 Remove and replace defective and non-conforming Work.

.10 Provide openings in non-structural elements of Work for penetrations of mechanical and electrical Work.

.11 Execute Work by methods to avoid damage to other Work, and which will provide proper surfaces to receive patching and finishing.

.12 Employ original installer to perform cutting and patching for weather-exposed and moisture-resistant elements, and sight-exposed surfaces.

.13 Cut rigid materials using masonry saw or core drill. Pneumatic or impact tools not allowed on masonry work without prior approval.

.14 Restore work with new products in accordance with requirements of Contract Documents.

.15 Fit Work airtight to pipes, sleeves, ducts, conduit, and other penetrations through surfaces.

.16 At penetration of fire rated wall, ceiling, or floor construction, completely seal voids with firestopping material, full thickness of the construction element.

.17 Refinish surfaces to match adjacent finishes: For continuous surfaces refinish to nearest intersection; for an assembly, refinish entire unit.

.18 Conceal pipes, ducts and wiring in floor, wall and ceiling construction of finished areas except where indicated otherwise.

Part 2 Products

2.1 NOT USED

.1 Not Used.

□

Part 3 Execution

3.1 NOT USED

.1 Not Used.

END OF SECTION

□

General

.1 SECTION INCLUDES

.1 Progressive cleaning.

.2 Final cleaning.

.2 RELATED SECTION

.1 Section 01 77 00 - Closeout Procedures.

.2 Section 01 11 00 – Summary of Work.

.3 REFERENCE STANDARDS

.1 Canadian Construction Documents Committee (CCDC)

.1 CCDC 2-2008, Stipulated Price Contract.

.4 GENERAL CLEANINESS DURING CONSTRUCTION

.1 Refer also to Section 01 11 10, item 1.30 ‘Periodic Cleaning’ and coordinate with this Section.

.2 Conduct cleaning and disposal operations to comply with local ordinances and anti-pollution laws.

.3 Store volatile wastes in covered metal containers, and remove from premises daily.

.4 Prevent accumulation of wastes which create hazardous conditions.

.5 Provide adequate ventilation during use of volatile or noxious substances.

.6 Use only cleaning materials recommended by manufacturer of surface to be cleaned, and as recommended by cleaning material manufacturer.

.7 Provide on-site dump containers for collection of waste materials, and rubbish.

.8 Remove waste materials, and rubbish from site.

.9 Vacuum clean interior building areas when ready to receive finish painting, and continue vacuum cleaning on an as-needed basis until building is ready for substantial completion or occupancy.

.10 Schedule cleaning operations so that resulting dust and other contaminants will not fall on wet, newly painted surfaces.

□

.5 FINAL CLEANING

.1 At completion of Work, remove waste materials, rubbish, tools, equipment, machinery, and surplus materials, and clean all surfaces exposed to view; leave project clean and ready for occupancy.

.2 Employ experienced, professional cleaners, for final cleaning.

.3 Remove grease, dust, dirt, stains, labels, fingerprints, and other foreign materials from all sight-exposed interior and exterior finished surfaces; polish resilient and ceramic surfaces so designated to shine finish. Vacuum carpet.

.4 Clean and polish glass and mirrors.

.5 Repair, patch and touch-up marred surfaces to specified finish, to match adjacent surfaces.

.6 Broom-clean paved surfaces; rake clean other surfaces of grounds.

.7 Clean exposed ductwork, and structure.

.8 Replace filters.

.9 Clean bulbs and lamps and replace those burned out.

.10 Clean diffusers and grilles.

.11 Clean sinks, faucets, and water closets and controls.

.12 Remove snow and ice from access to building, if applicable.

.13 Maintain cleaning until project, or portion thereof, is occupied by Owner.

Products

.1 NOT USED

.1 Not Used.

Execution

.1 NOT USED

.1 Not Used.

END OF SECTION

□

Part 1 General

1.1 REFERENCES

.1 Section 01 11 00 - Summary of Work, article 1.44.

.2 Canadian Construction Documents Committee (CCDC)

.1 CCDC 2 - 2008, Stipulated Price Contract.

1.2 INSPECTION AND DECLARATION

.1 Refer to Section 01 11 00 – Summary of Work, article 1.44 for a detailed list of requirements.

.2 Contractor's Inspection: Contractor and Subcontractors: conduct inspection of Work, identify deficiencies and defects, and repair as required to conform to Contract Documents.

.1 Notify Consultant in writing of satisfactory completion of Contractor's Inspection and that corrections have been made.

.3 Consultant's Inspection: Consultant and Contractor will perform inspection of Work to identify obvious defects or deficiencies. Contractor to correct Work accordingly.

.4 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 Fire Commissioner and Utility companies have been submitted.

.5 Operation of systems has been demonstrated to Owner's personnel.

.6 Work is complete and ready for final inspection.

.5 Final Inspection: when items noted above are completed, request final inspection of Work by Owner, Consultant and Contractor If Work is deemed incomplete by Owner and Consultant, complete outstanding items and request re-inspection.

.6 Declaration of Substantial Performance: when Owner and 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.

.7 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.

.8 Final Payment: when Owner and Consultant consider final deficiencies and defects have been corrected and it appears requirements of Contract have been totally performed, make application for final payment. If Work is deemed incomplete by Owner and Consultant, complete outstanding items and request re-inspection.

.9 Payment of Holdback: after issuance of Certificate of Substantial Performance of Work, submit an application for payment of holdback amount in accordance with CCDC 2-2008.

1.3 CLEANING

.1 In accordance with Section 01 74 11 – Cleaning.

.2 Remove waste and surplus materials, rubbish and construction facilities from the site immediately following completion of work and prior to final inspection.

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 RELATED SECTIONS

.1 Section 01 45 00 - Quality Control.

.2 Section 01 77 00 - Closeout Procedures.

.3 Section 01 78 10 - Guarantee/Warrantee Form

.4 Section 01 91 00 - Commissioning.

.5 Mechanical Division: Commissioning

.6 Section 01 11 00 Summary of Work, article 1.43.

1.3 SUBMISSION

.1 Submit one copy of completed project operation and maintenance volumes and as-built drawings in final form 15 days prior to substantial performance. For equipment put into use with Owner’s permission during construction, submit Operating and Maintenance Manuals within 10 days after start-up. For items of Work delayed materially beyond date of Substantial Performance, provide updated submittal within 10 days after acceptance, listing date of acceptance as start of warranty period.

.2 Prepare instructions and data using personnel experienced in maintenance and operation of described products.

.3 Copy will be returned after inspection with Consultant's comments.

.4 Revise content of documents as required prior to final submittal.

□

.5 Submit the revised volumes of data in final form within 10 days after final inspection.

.6 For contract drawings (architectural, site services, landscaping, structural, mechanical, and electrical)**,** transfer neatly as-built notations onto second and third set and submit all three sets. Cost of only the transfer of these as-built sets into digital format is paid from Cash Allowance. Completion of digital as-built to the Consultant is a mandatory requirement of Total Completion of the Contract.

.7 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.

.8 If requested, furnish evidence as to type, source and quality of products provided.

.9 Defective products will be rejected, regardless of previous inspections. Replace products at own expense.

.10 Pay costs of transportation.

1.4 FORMAT

.1 Organize data in the form of an instructional manual with a table of contents and cover page in digital PDF format. Provide on a CD and USB.

.2 Arrange contents in digital folders under Section numbers and sequence of Table of Contents.

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 clearly 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.

□

1.6 AS-BUILTS AND SAMPLES

.1 In addition to requirements in Sections 00 21 13 Instructions to Bidders, 01 11 00 Summary of Work and CCDC Contract terms, maintain at the site for Owner one record copy of:

- .1 Contract Drawings.
- .2 Specifications.
- .3 Addenda.
- .4 Change Orders and other modifications to the 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.

1.7 RECORDING ACTUAL SITE CONDITIONS

.1 Record information on set of black line opaque drawings, and in copy of Project Manual, provided by Consultant.

.2 Provide felt tip marking pens, maintaining separate colours for each major system, for recording information.

.3 Record information concurrently with construction progress. Do not conceal Work until required information is recorded.

.4 Contract Drawings and shop drawings: legibly mark each item to record actual construction, including:

- .1 Measured depths of elements of foundation in relation to finish first floor datum.
- .2 Measured horizontal and vertical locations of underground utilities and appurtenances, referenced to permanent surface improvements.
- .3 Measured locations of internal utilities and appurtenances, referenced to visible and accessible features of construction.
- .4 Field changes of dimension and detail.
- .5 Changes made by change orders.
- .6 Details not on original Contract Drawings.

□

.7 References to related shop drawings and modifications.

.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, and field test records, required by individual specifications sections.

1.8 DIGITAL AS-BUILT DRAWINGS

.1 Retain the services of a CAD drafting company acceptable to the Consultant.

.2 Transfer to digital file all information recorded on As-Built drawings. Layering of information as per Consultant’s instructions.

.3 The Consultant will provide CAD file of contract documents.

.4 The cost for preparing digital As-Built drawings will be deducted from the Cash Allowances.

1.9 EQUIPMENT AND SYSTEMS

.1 Each Item of Equipment and Each System: include description of unit or system, and component parts. Give function, normal operation characteristics, and limiting conditions. Include performance curves, with engineering data and tests, and complete nomenclature and commercial number of replaceable parts.

.2 Panel board circuit directories: provide electrical service characteristics, controls, and communications.

.3 Include installed colour coded wiring diagrams.

.4 Operating Procedures: include start-up, break-in, and routine normal operating instructions and sequences. Include regulation, control, stopping, shut-down, and emergency instructions. Include summer, winter, and any special operating instructions.

.5 Maintenance Requirements: include routine procedures and guide for trouble-shooting; disassembly, repair, and reassembly instructions; and alignment, adjusting, balancing, and checking instructions.

.6 Provide servicing and lubrication schedule, and list of lubricants required.

.7 Include manufacturer's printed operation and maintenance instructions.

.8 Include sequence of operation by controls manufacturer.

.9 Provide original manufacturer's parts list, illustrations, assembly drawings, and diagrams required for maintenance.

□

.10 Provide installed control diagrams by controls manufacturer.

.11 Provide Contractor's coordination drawings, with installed colour coded piping diagrams.

.12 Provide charts of valve tag numbers, with location and function of each valve, keyed to flow and control diagrams.

.13 Provide list of original manufacturer's spare parts, current prices, and recommended quantities to be maintained in storage.

.14 Include test and balancing reports as specified in Mechanical Sections.

.15 Additional requirements: As specified in individual specification sections.

1.10 MATERIALS AND FINISHES

.1 Building Products, Applied Materials, and Finishes: include product data, with catalogue number, size, composition, and colour and texture designations. Provide information for re-ordering custom manufactured products.

.2 Instructions for cleaning agents and methods, precautions against detrimental agents and methods, and recommended schedule for cleaning and maintenance.

.3 Moisture-protection and Weather-exposed Products: include manufacturer's recommendations for cleaning agents and methods, precautions against detrimental agents and methods, and recommended schedule for cleaning and maintenance.

.4 Additional Requirements: as specified in individual specifications sections.

1.11 MAINTENANCE MATERIALS

.1 On completion of project, submit to Architect a complete digital PDF of the Operations Data and Maintenance Manual in English, made up as follows:

.1 Enclose title sheet, labeled "Operation Data and Maintenance Manual", project name, date and list of contents.

.2 Organize contents into applicable sections of work to parallel project’s specification break-down. Mark each section by labeled tabs protected with celluloid covers fastened to hard paper dividing sheets.

.2 Include following information, plus data specified.

.1 Maintenance instruction for finished surface and materials.

.2 Copy of hardware and paint schedules.

.3 Description, operation and maintenance instructions for equipment and systems, including complete list of equipment and parts list. Indicate nameplate information such as make, size, capacity, serial number.

.4 Names, addresses and phone numbers of sub-contractors and suppliers.

.5 Guarantees, Warranties and bonds showing:

.1 Name and address of project.

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.2 Guarantee commencement date (date of Final Certificate of Completion).

.3 Duration of guarantee.

.4 Clear indication of what is being guaranteed and what remedial action will be taken under guarantee.

.5 Signature and seal of Contractor.

.6 Additional material used in project listed under various Sections showing name of manufacturer and source of supply.

.3 Neatly type lists and notes. Use clear drawings, diagrams or manufacturers' literature.

.4 Include one complete set of final shop drawings (bound separately) indicating corrections and changes made during fabrication and installation.

1.12 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.

1.13 WARRANTIES AND BONDS

.1 Refer to Section 00 21 13 ‘Instructions to Bidders’ for bonding requirements for this project, both at the time of tender submission and throughout the duration of the construction period.

.2 Refer to CCDC-2 2008 Contract for Warranty requirements and conditions for the standard warranty which is required for the work of this contract.

.3 Extended warranties are required to be issued by manufacturers, fabricators, suppliers and/or installers, sometimes jointly, due to their unique position in the construction process and their ability to guarantee a particular section of work. Refer to individual requirements of extended warranties requested as well as Section 01 11 00 article 1.33.

.4 Unless specifically noted otherwise, all extended warranties shall commence on the date of Substantial Performance of the Work as certified by the Consultant.

.5 Separate each warranty or bond with index tab sheets keyed to Table of Contents listing.

.6 List subcontractor, supplier, and manufacturer, with name, address, and telephone number of responsible principal. Use Guarantee/Warranty Form as provided in Section 017810 Sample Guarantee/Warranty Form, whenever standard preprinted trade or manufacturer’s Guarantee/Warranty forms are not available. Provide written form for each warranty specified in Section 01 11 00 Summary of Work, Article 1.33.

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.7 Obtain warranties and bonds, executed in duplicate by subcontractors, suppliers, and manufacturers, within 10 days after completion of the applicable item of work.

.8 Date at beginning of time of warranty start shall be Date of Substantial Performance.

.9 Verify that documents are in proper form, contain full information, and are notarized.

.10 Co-execute submittals when required.

.11 Retain warranties and bonds until time specified for submittal.

Part 2 Products

2.1 NOT USED

.1 Not Used.

Part 3 Execution

3.1 NOT USED

.1 Not Used.

END OF SECTION

□

1. GENERAL

1. To be made out on the letterhead of Guarantor or Warrantor which usually is a Subcontractor.

2. This format is to be used only when standard preprinted trade or manufacturer's forms are not available. Preprinted forms are to include all elements of information shown on this sample or as a minimum.

3. Comply with Requirements for Guarantee/Warranty as specified in Section 01 78 10, Closeout Submittals.

To: HALTON CATHOLIC DISTRICT SCHOOL BOARD
J.W. Singleton Centre
802 Drury Lane
Burlington, Ontario
L7R 2Y2

Date: _____

SECTION _____

TITLE _____

GUARANTEE/WARRANTY TO:

OWNER	The Halton Catholic District School Board
PROJECT	North Oakville #3 Catholic Elementary School Oakville, Ontario
ARCHITECT	Hossack Architecture
REFERENCE	(to specifications or drawings)
TIME	Period of Guarantee/Warranty: _____ years
GUARANTEE/ WARRANTY	Starting Date: Substantial Performance as certified by Consultant Date: _____

(Description of Guarantee/Warranty)

_____

_____

_____

Upon written notification from the Owner or the Consultant that the above work is defective any repair or replacement work required shall be to the Consultant's satisfaction at no cost to the Owner.

This guarantee shall not apply to defects caused by the work of others, maltreatment of materials, negligence or Acts of God.

SUBCONTRACTOR

_____ _____
Signature Date

Authorized Signing Officer:

_____
(Name Printed)

_____
Title

Name of Firm: _____

Address: _____

Telephone Number _____

CONTRACTOR

_____ _____
Signature Date

Authorized Signing Officer:

_____ _____
(Name Printed)

_____
Title

Name of Firm: _____ SEAL

Address: _____

Telephone Number _____

END OF SECTION

Part 1 General

1.1 WORK INCLUDED

.1 Section 20 05 11 – Mechanical Work Requirements and Division 1.

.2 Section 26 01 16 – Electrical General Requirements and Division 1.

.3 Section 28 31 25 – Fire Alarm System (Addressable)

.4 Section 21 12 13 – Fire Suppression Standpipe System

.5 Section 21 13 13 – Wet Pipe Fire Suppression

.6 Section 21 13 16 – Dry-Pipe Sprinkler Systems

.7 Section 23 33 17 – Smoke Control Dampers

.8 Section 26 51 16 – Digital Occupancy & Daylight Control Systems

.9 Section 26 51 13 – Lighting Equipment

.10 Section 26 32 15 – Power Generation Diesel

.11 Section 26 32 16 – Power Generation Natural Gas

.12 Section 26 36 23 – Automatic Transfer Switch (Ats)

.13 Section 00 00 00 – Elevators

.14 Section 00 00 00 – Fire Pumps

1.2 REFERENCES

.1 BC-2012, Ontario Building Code.

.2 CAN/ULC-S1001 Integrated System Testing of Fire Protection and Life Safety Systems.

.3 CAN/ULC-S524, Installation of Fire Alarm Systems.

.4 CAN/ULC-S537, Verification of Fire Alarm Systems.

.5 CAN/ULC-S573, Installation of Ancillary Devices Connected to Fire Alarm Systems

.6 CAN/ULC-S561, Installation and Service for Fire Signal Receiving Centres and Systems

.7 CAN/ULC-S112, Standard Method of Fire Test of Fire Damper Assemblies

.8 NFPA 13 – Fire Sprinkler Systems

.9 NFPA 14 – Standard for the Installation of Standpipe and Hose Systems

.10 NFPA 17A – Standard for Wet Chemical Extinguishing Systems

.11 NFPA 20 – Standard for the Installation of Stationary Pumps for Fire Protection

.12 NFPA 92 – Standard for Smoke Control Systems

.13 NFPA 96 – Standard for Ventilation Control and Fire Protection of Commercial Cooking Operations

.14 NFPA 654 – Standard for the Prevention of Fire and Dust Explosions from the Manufacturing, Processing, and Handling of Combustible Particulate Solids

.15 CSA-B44 – Safety Code for Elevators and Escalators

.16 CSA-282 – Emergency Power Supplies for Buildings

.17 UL-924 – Emergency Lighting Relays

1.3 OVERVIEW

.1 All work shall be performed in accordance with CAN/ULC-S1001 Integrated System Testing of Life Safety and Fire Protection Systems.

.2 The Building Code has adopted CAN/ULC-S1001 as the standard to comply with Integrated System Testing of Life Safety and Fire Protection Systems. The scope of this project shall follow the strict guidelines laid out in CAN/ULC-S1001 for Integrated Testing Planning, review, and implementation.

.3 The Integrated Testing Plan (ITP) will provide a full overview of all integration points of life safety and fire protection systems. The ITP will be submitted for review to the design professionals and Authority Having Jurisdiction (AHJ). Upon the successful completion of the ITP and all the respective systems, the Integrated Testing Coordinator (ITC) will provide a schedule to the design professionals, the AHJ, and all required participating members for the ITP to be conducted.

.4 The ITC will review all drawings, specifications, sequence of operations and methodology prepared by the design professionals, complete with the contractor's shop drawings and manufacture requirements.

.5 The ITP shall be coordinated with all sub-contractors and suppliers as outlined in 1.1.

.6 The ITC will conduct the ITP and will sign each integrated test form, complete with signatures from each participating member of the integrated systems.

.7 The ITC shall witness all integrations and not rely on the CAN/ULC-S537 Verification Inspection Report for fire protection system integration testing; however, the ITC may attend the verification to validate the testing.

.8 The ITC will provide all work and ITP including functional documentation, prescribed in CAN/ULC-S1001. Such testing and documentation has been deemed to satisfy OBC 2012 Sentence 3.2.10.

.9 The ITC will provide PDF and digital media copy of the buildings ITP and Integrated System Report (ITR) for the building owners use, re-testing and reproduction purpose.

.10 The systems applicable to the function testing include but not limited to;

- .1 Fire Alarm System (including sequence of operations)
- .2 Mass Notification System
- .3 Emergency Power Systems
- .4 Elevators
- .5 Audio/Visual
- .6 Lighting Controls
- .7 Notification Systems
- .8 Sprinkler Systems
- .9 Standpipe Systems
- .10 Fire Pumps

.11 Water Supplies
.12 Water Supply Control Valves
.13 Freeze Protection Systems
.14 Fixed Fire Suppression Systems
.15 Cooking Equipment Fire Suppression Systems
.16 Electromagnetic Locking Devices
.17 Smoke Control Pressurization Systems
.18 Smoke Control Smoke Exhaust Systems
.19 Hazardous Protection Monitoring
.20 Smoke Alarms
.21 Dust Collection Systems
.22 Spark Arrest Systems
.23 Smoke Damper Assemblies

Part 2 Execution

2.1 TESTING AND PLANNING

.1 The Integrated Testing Process must include following;

.1 Planning phase by the testing coordinator
.2 Integrated testing plan review by the design professionals
.3 Integrated testing plan review by the authority having jurisdiction
.4 Review of Sequence of operations
.5 System documentation
.6 Integrated System Testing Plan consisting of;

.1 Project Description
.2 Project contacts
.3 Overview and description of each integrated system
.4 System integrations & functional objective of each integrated system
.5 Integration matrix of all integrated system complete with integration type, Normal mode and off-normal mode.
.6 Test protocols and procedures of each integrated system
.7 Notifications
.8 Personnel safety
.9 Phased occupancies
.10 Pre-testing documentation check-list
.11 Testing forms
.12 Ongoing Integrated System Testing forms
.13 Integrated System Testing Completion form, and
.14 Integrated testing notes

2.2 RESPONSIBILITIES

.1 General Contractor:

.1 The General Contractor is to employ the services of the ITC firm as a sub-contractor, as part of the fixed fee contract 'C00 – Contractor'.

.2 Coordinate with the ITC for schedule and witness testing.

.3 Participate in the ITP and provide function testing of equipment within the mechanical, electrical and fire protection contract packages.

.4 Allow for any cost associated to re-testing of the ITP due to failures or insufficient work.

.5 Allow for any cost associated with phased occupancy and phased Integrated Testing work.

.2 Mechanical Contractor:

.1 The mechanical contractor shall confirm all mechanical systems listed in 1.3.10 are complete and fully operational, prior to the ITC commencing the functional testing.

.2 Provide system reports such as, but not limited to; air balancing reports, TSSA inspection reports, start-up reports, commissioning reports, verification reports. The contractor shall further provide written letter confirming all mechanical systems are installed and operating as intended by the contract documents and sequence of operations.

.3 Participate in the ITP and provide function testing of equipment within the mechanical contract package.

.4 Allow for any cost associated to re-testing of the ITP due to failures or insufficient work.

.5 Allow for any cost associated with phased occupancy and phased Integrated Testing work.

.3 Fire Protection Contractor:

.1 The fire protection contractor shall confirm all fire protection systems listed in 1.3.10 are complete and fully operational, prior to the ITC commencing the functional testing.

.2 Provide system reports such as, but not limited to; NFPA 13 letter, NFPA 20, letter, above ground sprinkler piping letter, below ground sprinkler letter, system designer letter, start-up reports, commissioning reports, verification reports. The contractor shall further provide written letter confirming all fire protection systems are installed and operating as intended by the contract documents and sequence of operations.

.3 Participate in the ITP and provide function testing of equipment within the fire protection contract package.

.4 Allow for any cost associated to re-testing of the ITP due to failures or insufficient work.

.5 Allow for any cost associated with phased occupancy and phased Integrated Testing work.

.4 Electrical Contractor:

.1 The electrical contractor shall confirm all electrical systems listed in 1.3.10 are complete and fully operational, prior to the ITC commencing the functional testing.

.2 Provide system reports such as, but not limited to; ESA Inspection Certificate, Fire Alarm Verification, TSSA Inspection, Generator Start-up report, commissioning reports, and verification reports. The contractor shall further provide written letter confirming all electrical systems are installed and operating as intended by the contract documents and sequence of operations.

.3 Participate in the ITP and provide function testing of equipment within the electrical contract package.

.4 Allow for any cost associated to re-testing of the ITP due to failures or insufficient work.

.5 Allow for any cost associated with phased occupancy and phased Integrated Testing work.

.5 Equipment Manufacturers:

.1 Where required, shall confirm all respective systems listed in 1.3.10 are complete and fully operational, prior to the ITC commencing the functional testing.

.2 Participate in the ITP and provide function testing of equipment within the respective contract package.

.6 Design Professionals:

.1 Shall review the ITP, and upon review, accept the ITP as the agreed ITP for implementation.

.2 The design professionals are responsible for design. Upon an unsuccessful test, the failure will be documented and provided to the respective design professionals for review and action.

.3 Participate in the ITP and provide function testing of equipment within the electrical contract package.

2.3 NOTIFICATIONS OF TESTING IMPLEMENTATION PROCESS

.1 The ITC shall work with the General Contractor, Owner, sub-contractors, design professionals and the AHJ to provide a schedule for the implementation of the ITP.

.2 The ITC shall provide notification to the integrated testing participants seven (7) days prior to the date and time for the implementing of the ITP.

.3 In the event of building occupants, the ITC shall provide at a minimum, fourth-eight (48) hour notice of the implementation of the integrated testing. Notification shall be provided via written notices posted at each building entrance.

2.4 TESTING IMPLEMENTATION PROCESS

.1 Implementation of the integrated test shall follow all job site and personnel safety requirements set out in the contract and General Contractors requirements.

.2 The ITC shall define;

.1 Personnel Safety protocols

.2 Special hazards

.3 Team communications, and

.4 Occupant notification of emergencies.

.3 The integrated system test shall follow the methodology and process outlined in CAN/ULC-S1001 as the requirement for this project.

.1 Provide the final ITP to the Consultant fourteen (14) days prior to scheduled implementation and test.

.4 The respective contractors and manufactures are responsible to start-up and function test their respective systems, for observation and witnessing by the ITC. The ITC will record the results and the respective contractor and manufacture will restore the system to a normal condition. Upon successful testing the contractor and manufacture will initial the respective integrated testing from adjacent to their respective test.

.5 Upon a failure of a test, the ITC will document the failure and continue with the testing of other integrations. The respective contractor and manufacture will document the failure, notify they design professional and correct the failure under the direction of the design professional.

.1 The ITC will re-test the unsuccessful integration after the correction has been documented and verified.

.6 Upon a failure of a device (such as a smoke detector), the contractor may immediately replace the device and the ITC may continue to test the integration. The device failure maybe documented but shall not result in a failed integrated test.

.7 Upon successfully completing the ITP. The ITC shall provide the ITR to the building owner.

2.5 QUALITY CONTROL

.1 The integrated system testing coordinator must meet the following criteria to be considered acceptable for this project:

.1 Firms regular engaged with contractors in function testing, fire alarm verification, sprinkler system testing, annual inspections and maintenance of fire and life safety systems.

.2 Firms knowledgeable and experience of the respective Codes and Standards of the particular project, including but not limited to; Building Codes, Fire Codes, ULC Standards, CSA Standards, and NFPA Standards

.3 Firms must be a member in good standing of the Canadian Fire Alarm Association (CFAA).

.4 Vendors must be a 3rd party and independent from the fire protection and life safety system installation company present on the project in accordance with ULC Certification Bulletin 2020-08.

.5 Firms must maintain operations in the province of Ontario for at least five years.

.6 The Contractor shall show satisfactory evidence, upon request, that he maintains a fully equipped service organization capable of furnishing adequate inspection and service to the systems.

2.6 QAULITY INTEGRATED TESTING COORDINATOR

.1 As a reference for bidders, experienced ITC Firms include these listed below or local branches of these companies noted in the vicinity of this project and are acceptable as a sub-contractor to the General Contractor: **(WRITER TO EDIT – include if designer is to include reference test firms for bidder information)**

.1 ITC Solutions
20 Hanson Ave Unit 3
Kitchener, ON N2C 2E2

.2 Troy Life and Fire Safety
900 Maple Grove Rd., Unit #1
Cambridge, ON N3H 4R7

.3 Control Tech Systems
69 Regal Road
Guelph, ON N1K 1B6

.4 Lonergan Engineering
4 Industrial Parkway South
Aurora, ON L4G 3W1

.5 Guardian Fire Consulting Group
55-346 Northfield Dr. E.
Waterloo, ON N2K 3T6

.2 Other firms to these listed above, who meet the Quality Control criteria, may be considered as acceptable to bid provided they submit in writing, to the Consultant's office confirmation of the items listed in the criteria above, a minimum of one week prior to tender close in order to be considered as a bidder.

END OF SECTION

Part 1 General

1.1 QUALITY ASSURANCE

.1 This Section includes parameters for the general design and performance for the work of Sections which comprise the building envelope including but not limited to, masonry cavity walls, metal cladding, soffits, windows, entrances and roofing.

.2 Performance of the building envelope shall be guaranteed by the Contractor.

1.2 DESIGN

.1 General: Design and engineer as required, fabricate, erect, and/or install building envelope in compliance with the Ontario Building Code, other regulations and requirements of authorities having jurisdiction.

.2 Take into account construction tolerance limitations, creepage, deflection and other movements of the structure.

.3 Accommodate, by means of expansion and contraction provisions, any movement in the building envelope assemblies themselves and between the assemblies and the building structure. Allow for expansion and contraction of components caused by ambient temperature range, surface temperature variation of components, wind, seismic forces, structural deflection and racking; without causing misalignment of joints, breakage of joints and air/vapour barriers, water and air penetration through the assembly, glass breakage, or other defects detrimental to appearance or performance.

.4 Method of attachment to the structure shall take into account site peculiarities so that site and air vibrations or normal temperature movements of the building do not loosen, weaken and/or fracture the connection between building envelope assembly components and the structure or between the components themselves.

.5 Reinforce building envelope assembly components, as required, so that the members can safely sustain design loads.

.6 Assemble and secure assemblies in manner which will keep stresses on sealants within the sealant manufacturer's recommended maximum performance levels.

.7 Rain Screen Principle: Except where detailed otherwise, construct building envelope assemblies based on the "Rain Screen" principle as advocated by the National Research Council of Canada. All voids between the assembly components as well as those between components and the structure shall have:

.1 Gaskets, baffles, overlaps, seals and compartmentalization as required providing a barrier "Rain Screen" to effectively prevent excessive rain water entry into any of the building envelope cavities but to allow pressure equalization of cavity air spaces.

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.2 air barriers and seals are required to prevent entry of interior building air into building envelope cavities, and exterior air into the building. Air barriers and seals shall be able to withstand wind design pressures.

.3 such provisions in the form of openings between cavities and the building exterior of sufficient cross sections to provide adequate pressure equalization. All openings shall be effectively baffled against direct rain water entry. Air spaces shall be baffled and compartmentalized to prevent chimney effect within the air spaces vertically and horizontally.

.4 Thermal separators, isolators and seals placed to eliminate contact between interior humid air and a cold surface or structural component to prevent condensation and ice build-up on such surfaces during cold weather.

1.3 WATER, VAPOUR AND MOISTURE

.1 Comply with the design and performance requirements specified in the building code, and as specified herein, including the following principles:

.2 Drain to the exterior face of the assembly, any water entering at joints and any condensation occurring within the building envelope assembly.

.3 Design, fabricate and install the assembly to be watertight to the interior under the interior and exterior design conditions in combination with movements occurring due to loads imposed.

.4 At design conditions no water penetration to the building interior side of the assembly shall occur.

.5 The requirements for an air barrier and a vapour barrier are intended to be provided at the same plane in the building envelope design unless otherwise indicated or specified. In such cases, the Drawings and Specifications refer to "air/vapour barrier". The definition of the air/vapour barrier for the purpose of these Specifications is "a continuous membrane including joints of membrane between components and to adjacent construction which prevents or retards penetration of moisture laden air and the diffusion of water vapour through it".

.6 The maximum water vapour transmission of all components forming the vapour barrier shall be (1.72 ng/Pa x s x sq.m.) (0.3 Imperial Perms) unless specified otherwise.

.7 At design conditions no condensation shall occur on room side surfaces.

.8 Sound: Provide completed installations free from vibrations, wind whistles and noise due to thermal and structural movement and wind pressure.

.9 Seismic: Fabricate and erect cladding assemblies to prevent damage due to earthquake forces as required by The Ontario Building Code. Also refer to *Section 01 11 00 – 'Summary of Work, article 1.10, Seismic Design Requirements'*.

□

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 RELATED REQUIREMENTS

.1 Section 03 30 01 Landscape Cast-in-Place Concrete

.2 Section 32 13 13 Concrete Paving and Edges

1.2 REFERENCE STANDARDS

.1 CSA Group (CSA)

.1 CSA-A23.1-[14] /A23.2-[14] , Concrete Materials and Methods of Concrete Construction/Methods of Test and Standard Practices for Concrete.

.2 CSA S269.1-[16] , Falsework and Formwork.

.3 CAN/CSA-S269.3-[M92(R2003)] , Concrete Formwork.

1.3 ACTION AND INFORMATIONAL SUBMITTALS

.1 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 proprietary materials used in formwork and coatings and include product characteristics, performance criteria, physical size, finish, and limitations.

1.4 DELIVERY, STORAGE AND HANDLING

.1 Deliver, store, and handle materials in accordance with Section with manufacturer's written instructions.

.2 Delivery and Acceptance Requirements: deliver materials to site in original factory packaging, labelled with manufacturer's name and address.

.3 Storage and Handling Requirements:

.1 Store materials off ground, in dry location and in accordance with manufacturer's recommendations in clean, dry, well-ventilated area.

.2 Store and protect formwork from damages.

.3 Replace defective or damaged materials with new.

Part 2 Products

2.1 MATERIALS

.1 Formwork materials:

.1 Use formwork materials to CSA-A23.1/A23.2.

.2 Tubular forms: round, internally treated with release material.

.1 Sonotube or equivalent.

.3 Form ties:

.1 For vertical landscape architectural concrete, concrete seat walls, tall concrete edges; snap ties complete with plastic cones and light grey concrete plugs.

.4 Form panels:

.1 Plywood: medium density overlay plyform

.5 Form release agent: Proprietary, non volatile material not to stain concrete or impair subsequent application of finishes or coatings to surface of concrete, derived from agricultural sources, non petroleum containing, low VOC and non-toxic.

.6 Falsework materials: to CSA-S269.1.

.7 Flagpole Base: Newavea 510R-Low, as manufactured by ArtForms International Inc. T: 905-642-3225, or approved equivalent.

Part 3 Execution

3.1 FABRICATION AND ERECTION

.1 Verify lines, levels, and centres before proceeding with formwork/falsework and ensure dimensions agree with drawings.

.2 Fabricate and erect falsework in accordance with CSA S269.1.

.3 Fabricate and erect formwork in accordance with CAN/CSA-S269.3 to produce finished concrete conforming to shape, dimensions, locations and levels indicated within tolerances required by CSA-A23.1/A23.2.

.4 Align form joints and make watertight.

.1 Keep form joints to minimum.

.5 Use 25 mm chamfer strips on external corners and 25 mm fillets at interior corners, joints, unless specified otherwise.

.6 Form chases, slots, openings, drips, recesses, expansion and control joints as indicated.

.7 Build in anchors, sleeves, and other inserts required to accommodate Work specified in other sections.

.1 Ensure that anchors and inserts will not protrude beyond surfaces designated to receive applied finishes, including painting.

.8 Clean formwork in accordance with CSA-A23.1/A23.2, before placing concrete.

3.2 REMOVAL AND RESHORING

.1 Remove formwork when concrete has reached 70% of its 28 day design strength or minimum period noted above, whichever comes later, and replace immediately with adequate reshoring.

.2 Re-use formwork and falsework subject to requirements of CSA-A23.1/A23.2.

3.3 CLEANING

.1 Leave Work area clean at end of each day.

.2 Final Cleaning: upon completion remove surplus materials, rubbish, tools and equipment.

END OF SECTION

Part 1 General

1.1 RELATED REQUIREMENTS

.1 Section 03 10 01 Landscape Concrete Forming and Accessories

.2 Section 32 13 13 Concrete Paving and Edges

1.2 REFERENCE STANDARDS

.1 ASTM International

.1 ASTM C260/C260M-[10a(2016)] , Standard Specification for Air-Entraining Admixtures for Concrete.

.2 ASTM C309-[11] , Standard Specification for Liquid Membrane-Forming Compounds for Curing Concrete.

.3 ASTM C494/C494M-[16] , Standard Specification for Chemical Admixtures for Concrete.

.4 ASTM C 881/C881M-[15] , Standard Specification for Epoxy-Resin-Base Bonding Systems for Concrete.

.5 ASTM C1017/C1017M-[13e1] , Standard Specification for Chemical Admixtures for Use in Producing Flowing Concrete.

.6 ASTM C C1059/C1059M-[13] , Standard Specification for Latex Agents for Bonding Fresh To Hardened Concrete.

.7 ASTM D412-[16] , Standard Test Methods for Vulcanized Rubber and Thermoplastic Elastomers-Tension.

.8 ASTM D624-[2012] , Standard Test Method for Tear Strength of Conventional Vulcanized Rubber and Thermoplastic Elastomer.

.9 ASTM D1751-[04(2013)e1] , Standard Specification for Preformed Expansion Joint Filler for Concrete Paving and Structural Construction (Nonextruding and Resilient Bituminous Types).

.10 ASTM D1752-[04a(2013)] , Standard Specification for Preformed Sponge Rubber Cork and Recycled PVC Expansion Joint Fillers for Concrete Paving and Structural Construction.

.2 Canadian General Standards Board (CGSB)

.1 CAN/CGSB-51.34-[M86] , Vapour Barrier, Polyethylene Sheet for Use in Building Construction.

.3 CSA Group

.1 CSA A23.1/A23.2-[14] , Concrete Materials and Methods of Concrete Construction/Methods of Test and Standard Practices for Concrete.

.2 CSA A283-[06-R2016] , Qualification Code for Concrete Testing Laboratories.

.3 CSA A3000-[13] , Cementitious Materials Compendium (Consists of A3001, A3002, A3003, A3004 and A3005),

1.3 ABBREVIATIONS AND ACRONYMS

.1 Portland Cement: hydraulic cement, blended hydraulic cement (XXb - b denotes blended) and Portland-limestone cement types:

.1 GU, GUb and GUL - General use cement.

.2 MS and MSb - Moderate sulphate-resistant cement.

.3 MH, MHb and MHL - Moderate heat of hydration cement.

.4 HE, HEb and HEL - High early-strength cement.

.5 LH, LHb and LHL - Low heat of hydration cement.

.6 HS and HSb - High sulphate-resistant cement.

.2 Fly ash types:

.1 F - with CaO content maximum 8%.

.2 CI - with CaO content 15 to 20%.

.3 CH - with CaO minimum 20%.

.3 GGBFS - Ground, granulated blast-furnace slag.

1.4 ACTION AND INFORMATIONAL SUBMITTALS

.1 Provide 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 proprietary materials used in Cast-In-Place Concrete and include product characteristics, performance criteria, physical size, finish and limitations.

.3 Shop Drawings: Submit complete reinforcement fabrication and installation shop drawings indicating location, bar size, dowels, lap length, placement and concrete coverage, and dimensions.

.4 Site Quality Control Submittals:

.1 Provide testing and inspection reports for review by Consultant and do not proceed without written approval when deviations from mix design or parameters found.

.2 Concrete pours: provide accurate records of poured concrete items indicating date and location of pour, quality, air temperature and test samples taken as described in PART 3 - FIELD QUALITY CONTROL.

1.5 QUALITY ASSURANCE

.1 Quality Assurance: in accordance with Section 01 45 00- Quality Control.

.2 Provide Consultant, minimum 4 weeks prior to starting concrete work, with valid and recognized certificate from plant delivering concrete.

.1 Provide test data and certification by qualified independent inspection and testing laboratory that materials and mix designs used in concrete mixture meet specified requirements.

.3 Minimum 4 weeks prior to starting concrete work, provide proposed quality control procedures for review by Consultant on following items:

.1 Falsework erection.

.2 Hot weather concrete.

.3 Cold weather concrete.

.4 Curing.

.5 Finishes.

.6 Formwork removal.

.7 Joints.

.4 Quality Control Plan: provide written report to Consultant verifying compliance that concrete in place meets performance requirements of concrete as established in PART 2 - PRODUCTS.

.5 Mock-Ups:

.1 Provide site mock-up for finished concrete indicating forming methods and materials, and procedures proposed to achieve finish as shown on drawings, and to comply with following requirements, using materials indicated for completed work:

.1 Build mock-ups in location and of size as directed by Consultant.

.2 Obtain Consultant's acceptance of mock-ups before starting construction; mock-up used throughout construction period and used as standard of acceptance for subsequent architectural concrete work.

.3 Mock-up may form part of permanent structure when accepted by Consultant; repair or replace unacceptable mock-ups at no additional cost to Owner.

1.6 DELIVERY, STORAGE AND HANDLING

.1 Delivery and Acceptance Requirements:

.2 Concrete hauling time: deliver to site of Work and discharged within 120 minutes maximum after batching.

.1 Modifying maximum time limit without receipt of prior written agreement from laboratory representative and concrete producer as described in CSA A23.1/A23.2. is prohibited.

.2 Concrete delivery: ensure continuous concrete delivery from plant meets CSA A23.1/A23.2.

1.7 SITE CONDITIONS

.1 Placing concrete during rain or weather events that could damage concrete is prohibited.

.2 Protect newly placed concrete from rain or weather events in accordance with CSA A23.1/A23.2.

.3 Cold weather protection:

.1 Maintain protection equipment, in readiness on Site.

.2 Use such equipment when ambient temperature below 5°C, or when temperature may fall below 5°C before concrete cured.

.3 Placing concrete upon or against surface at temperature below 5°C is prohibited.

.4 Hot weather protection:

.1 Protect concrete from direct sunlight when ambient temperature above 27°C.

.2 Prevent forms of getting too hot before concrete placed. Apply accepted methods of cooling not to affect concrete adversely.

.5 Protect from drying.

Part 2 Products

2.1 MATERIALS

.1 Portland Cement: GU to CSA A3001.

.2 Supplementary cementing materials: in accordance with CSA A3001.

.3 Water: to CSA A23.1.

.4 Aggregates: to CSA A23.1/A23.2.

.5 Admixtures:

.1 Air entraining admixture: to ASTM C260.

.1 Sika AER, as distributed by Sika.

.2 Chemical admixture: to ASTM C494. Consultant to approve accelerating or set retarding admixtures during cold and hot weather placing.

.6 Curing compound: to CSA A23.1/A23.2.

.7 Premoulded joint fillers:

.1 Bituminous impregnated fibre board: to ASTM D1751.

.8 Weep hole tubes: plastic or galvanized steel.

.9 Concrete Bonding Agents: Latex to ASTM C1059/C1059M.

.10 Reinforcing Steel:

.1 Concrete Walls or Tall Edges; #10M or #15M, epoxy coated continuous bars, placed as indicated on drawings.

.2 Flatwork: Refer to Section 32 13 13 Concrete Paving and Edges.

2.2 MIXES

.1 Mix in accordance with CSA A23.1/A23.2.

.2 Ensure materials used in concrete mix have been submitted for testing and meet requirements of CSA A23.1.

.3 Co-ordinate construction methods to suit concrete mix proportions and parameters.

.4 Identify and report immediately to Consultant when concrete mix design and parameters pose anticipated problems or deficiencies related to construction.

.1 Class of exposure: C-2.

.2 Nominal size of course Aggregate: 19mm

.3 Admixture: chemical to ASTM C494/C494M.

.4 Water: to CSA A23.1/A23.2

.5 Air content category: 1 .

.6 Slump: at time and point of discharge max 3 +/- 0.5in.

2.3 FINISHES

.1 Concrete Seat walls: As indicated on drawings.

.1 Formed finish with steel trowel top. Light sandblast.

.2 Keep form joints to a minimum.

.2 Concrete retaining walls: As indicated on drawings.

.1 Formed finish with steel trowel top.

.2 Keep form joints to a minimum.

.3 Concrete Paving and Edges: Refer to Section 32 13 13 Concrete Paving and Edges.

Part 3 Execution

3.1 PREPARATION

.1 Obtain Consultant's approval before placing concrete.

.1 Provide consultant 24 hours minimum notice prior to placing of concrete.

.2 Place concrete reinforcing accurately and secure in place.

.3 During concreting operations:

.1 Development of cold joints not allowed.

.2 Ensure concrete delivery and handling facilitate placing with minimum of re-handling, and without damage to existing structure or Work.

.4 Pumping of concrete permitted only after approval of equipment and mix.

.5 Disturbing reinforcement and inserts during concrete placement is prohibited.

.6 Prior to placing of concrete obtain Consultant's approval of proposed method for protection of concrete during placing and curing in adverse weather.

.7 Protect previous Work from staining.

.8 Clean and remove stains prior to application for concrete finishes.

.9 Maintain accurate records of poured concrete items to indicate date, location of pour, quality, workability, air content, temperature and test samples taken.

.10 In locations where new concrete dowelled to existing work, drill holes in existing concrete.

.1 Place steel dowels and pack solidly with shrinkage compensating grout to anchor and hold dowels in positions as indicated.

.11 Do not place load upon new concrete until authorized by Consultant.

3.2 INSTALLATION/APPLICATION

.1 Do cast-in-place concrete work to CSA A23.1/A23.2.

.2 Sleeves and inserts:

.1 Do not eliminate or displace reinforcement to accommodate hardware. If inserts cannot be located as specified, obtain written approval of modifications from Consultant before placing of concrete.

.2 Confirm locations and sizes of sleeves and openings shown on drawings.

.3 Set special inserts for strength testing as indicated and as required by non-destructive method of testing concrete.

.3 Anchor bolts:

.1 Set anchor bolts to templates in co-ordination with appropriate trade prior to placing concrete.

.2 Grout anchor bolts in preformed holes or holes drilled after concrete has set only after receipt of written approval from Consultant.

.3 Drilled holes: to manufacturers' recommendations.

.4 Protect anchor bolt holes from water accumulations, snow and ice build-ups.

.5 Set bolts and fill holes with shrinkage compensating grout.

.6 Locate anchor bolts used in connection with expansion shoes, rollers and rockers with due regard to ambient temperature at time of erection.

.4 Drainage holes and weep holes:

.1 Form weep holes and drainage holes in accordance with Section 03 10 01-Landscape Concrete Forming and Accessories. If wood forms used, remove them after concrete has set.

.2 Install weep hole tubes and drains as indicated.

.5 Grout under base plates using procedures in accordance with manufacturer's recommendations which result in 100 % contact over grouted area.

.6 Finishing and curing:

.1 Finish concrete to CSA A23.1/A23.2.

.2 Use procedures as noted in CSA A23.1/A23.2 to remove excess bleed water. Ensure surface not damaged.

.3 Use curing compounds compatible with applied finish on concrete surfaces.

.4 Rub exposed sharp edges of concrete with carborundum to produce 3 mm minimum radius edges unless otherwise indicated.

.7 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 required for joint, fasten abutting ends and hold securely to shape by stapling or other positive fastening.

.3 Locate and form expansion joints as indicated.

.4 Install joint filler.

.5 Use 13 mm thick joint filler to separate slabs-on-grade from vertical surfaces and extend joint filler from bottom of slab to within 12mm of finished slab surface unless indicated otherwise.

3.3 SURFACE TOLERANCE

.1 Concrete tolerance to CSA A23.1, 3mm in 3m using straight edge method.

3.4 FIELD QUALITY CONTROL

.1 Site tests: conduct tests as follows and submit report as described in PART 1 - ACTION AND INFORMATIONAL SUBMITTALS.

.1 Concrete pours.

.2 Slump.

.3 Air content.

.4 Compressive strength at 7 and 28 days.

.5 Air and concrete temperature.

.2 Inspection and testing of concrete and concrete materials carried out by testing laboratory to CSA A23.1/A23.2.

.1 Ensure testing laboratory certified to CSA A283.

.3 Inspection or testing by Consultant not to augment or replace Contractor quality control nor relieve Contractor of contractual responsibility.

3.5 CLEANING

.1 Clean in accordance with Section 01 74 00 - Cleaning.

END OF SECTION

PART 1 – GENERAL

1.1 General Requirements

.1 Also included in this section are clauses for the following items:

Architectural Quality Concrete
Concrete Forming and Accessories
Concrete Reinforcing
Concrete Toppings
Defective Concrete
Finishing of Formed Surfaces
Finishing Treatment of Slab Surfaces (Screeding and Trowelling)
Sealing and Curing
Slabs-on-Grade

.2 Make a thorough examination of the drawings, site, specification and geotechnical report, to determine the intent, extent, materials and conditions of interfacing with other work and to be fully cognizant of the requirements.

.3 Assume full responsibility for the design, for the adequacy and for the safety of all formwork and falsework.

.4 The Contractor shall ensure that no asbestos containing materials are used in connection with the work of this section.

1.2 Reference Standards

.1 Comply with The Building Code Act, as amended, the 2024 Ontario Building Code (OBC) as amended and Regulations and by-laws of other authorities having jurisdiction, including latest amendments thereto; all hereafter referred to as Building Code.

.2 All codes, standard specifications and by-laws referred to in this Specification shall be current editions including all latest revisions, addenda and supplements, unless otherwise noted in the Building Code.

.3 Conform to the following CSA Standards:

.1	A23.1	Concrete Materials and Methods of Concrete Construction.
.2	A23.2	Test Methods and Standard Practices for Concrete.
.3	A23.3	Design of Concrete Structures.
.4	A3000	Cementitious Materials Compendium.

.5 G30.18 ..... Carbon Steel Bars for Concrete Reinforcement.

.6 S269.1 ..... Falsework and Formwork.

.7 W186..... Welding of Reinforcing Bars in Concrete Construction.

.4 Conform to the following ASTM Standards:

.1 C94/C94M ..... Standard Specification for Ready-Mixed Concrete.

.2 C309..... Standard Specification for Liquid Membrane Forming Compounds for Curing Concrete.

.3 C661..... Standard Test Method for Indention Hardness of Elastomeric-Type Sealants by Means of a Durometer.

.4 C1116/C1116M ..... Standard Specification for Fiber Reinforced Concrete.

.5 D1751 ..... Standard Specification for Preformed Expansion Joint Filler for Concrete paving and Structural Construction (Nonextruding and Resilient Bituminous Types).

.6 E1643..... Standard Practice for Selection, Design, Installation, and Inspection of Water Vapor Retarders Used in Contact with Earth or Granular Fill Under Concrete Slabs.

.7 E1745..... Standard Specification for Plastic Water Vapor Retarders Used in Contact with Soil or Granular Fill under Concrete Slabs.

.5 Conform to:

.1 ACI 214R..... Guide to Evaluation of Strength Test Results of Concrete.

.2 ACI 303R..... Guide to Cast-in-Place Architectural Concrete Practice.

.6 Conform to SP-66, ACI Detailing Manual and the RSIC Reinforcing Steel Manual of Standard Practice.

.7 In the event of conflict between reference standards, codes, drawings and specifications, the Contractor shall request clarification by the Consultant. The Consultant's decision as to which requirements govern shall be final and binding. Generally the more stringent provision shall govern. No extras to the contract will be approved due to such clarification.

.8 Conform to the Occupational Health and Safety Act, R.S.O. 1990, c. O.1, last amendment.

1.3 Shop Drawings

.1 Provide shop drawings (placing drawings and bar lists) showing dimensions and complete information necessary for fabrication and placing reinforcing steel and accessories.

.2 Submit shop drawings in accordance with directions.

.3 Allow ten (10) working days for the review of shop drawings and supply as many copies for review and distribution as directed. Shop drawings shall be checked in detail by the General Contractor before submission. Drawings which fail to meet this requirement shall be returned marked NOT REVIEWED.

.4 Review of the Shop Drawings is for general conformance with the design concept of the project and general compliance with the information given in the contract documents. The Contractor is responsible for confirming, correlating all quantities and dimensions, and is not relieved of the responsibility for compliance with the intent of the drawings and specifications.

.5 Only shop drawings bearing the review stamps, signed and dated shall be kept at site.

1.4 Source Quality Assurance

.1 Concrete supplied to this project shall meet the "Performance Based Specification" for concrete supply as adopted by the Ready Mix Concrete Association of Ontario.

.2 SUBMITTALS

Brand names, and when requested, manufacturer's data sheets, detail drawings or diagrams of all items which are proposed for use in the concrete mix, or which are to be cast in or attached to the concrete structure or will affect the concrete structure in any way, are to be submitted for review.

These shall include but not be limited to:

.1 A schedule of "Standardized mix designs" which indicates compliance with the Construction Documents. Schedule to include but not be limited to:

.1 Concrete mix for each exposure class and strength to be utilized in the project.

.2 Water/cementitious materials ratio (w/cm).

.3 Air entrainment %, if applicable.

.4 Include “Pump Mixes” if proposed for use.

.5 Brand name and dosage of synthetic fibres.

.6 Brand names of all admixtures to be incorporated into the mixes.

.2 Brand names and, if requested, manufacturers’ data sheet of proposed curing compound.

.3 If requested, provide a certified copy of a mill test report of the reinforcing supplied, and samples of reinforcing bars to be used on this project for testing by the appointed Inspection and Testing Company before delivery to the site.

.4 If requested, for unidentified reinforcing steel or reinforcing steel from non-Canadian mills, submit test data from an approved testing company verifying that each size and grade of reinforcing steel meets the Specification requirements. Pay for cost of such testing.

.5 Shop drawings of elevators, showing complete details of proposed connections to the structure, including pockets, inserts and loadings.

.6 Shop drawings of exterior walls panels showing complete details of proposed connections to the structure, including pockets, inserts and loadings.

.7 Shop drawings of steel and precast concrete stairs showing complete details of connections to the structure including pockets, inserts and loadings. Shop drawings to be stamped by a Licensed Professional Engineer.

.8 Cement finishing of floors shall be by a specialist sub-contractor thoroughly experienced in this type of work and a member in good standing with the Concrete Floor Contractors Association of Ontario (CFCAO). Submit references when requested.

.3 MATCH SAMPLE OF ARCHITECTURAL QUALITY CONCRETE.

.1 Provide a sample of “Architectural Concrete” including reveals, to the Architect’s approval. Repeat at no cost to the owner until approval has been given.

.2 All “Architectural Quality” concrete throughout the project shall match or exceed the quality level of the approved “Match” sample as to surface, cone tie pattern and other features as directed.

.3 Refer also to **Architectural Quality Concrete** later in this section.

.4 Pre-Construction meetings as specified in this section.

PART 2 - PRODUCTS

2.1 Materials

.1 FORMWORK

.1 Formwork lumber: Plywood and wood formwork materials are to conform to CSA A23.1.

.2 Plywood: Form plywood shall be exterior grade. Plywood shall be resin coated one side (in contact with concrete). Use sound undamaged plywood with clean true edges. Make-up or patching strips between panels shall be kept to a minimum.

.3 Falsework Materials: To conform to CSA S269.1. Materials shall bear grade marks or be accompanied with certificates, test reports or other proof of conformity.

.4 Formwork Release Agent: Shall be a proprietary material which will not stain the concrete or impair the natural bonding or color characteristics of coating intended for use on the concrete.

.5 Form Ties: Removable or “snap off” metal ties, fixed or adjustable lengths, free of devices leaving holes larger than 25 mm [1″] diameter in the concrete surface.

.6 Exposed Surfaces

.1 Form materials for concrete surfaces which require smooth and uniform surfaces for applied finishes or other purposes, shall consist of square edged smooth panels of plywood, metal or plastic. The panels shall be square and made in a true plane, clean, free of holes, surface markings and defects.

.2 Refer also to **Architectural Quality Concrete** later in this section.

.7 Circular (Tubular) Column Forms

.1 Internally treated with release material.

Acceptable Types:

SONOTUBE ..... by Sonoco
POLI-PERMAFORM ..... by Atlas Construction Specialties
Other types subject to submission and acceptance.

.2 Where required by the Architectural drawings and finish schedules provide lined forms so that no spiral line is visible in the finished concrete surface.

.2 REINFORCING AND ACCESSORIES

.1 Reinforcing Bars:

.1 Shall be new deformed “Hi-Bond” bars conforming with CSA G30.18M with a minimum yield stress of 400 MPa [58 ksi]. All bars to have Typical Identification Patterns and standard identification requirements.

.2 Epoxy coating is to conform to the specified standard, applicator is to be certified by RSIC.

.2 Welded Wire Mesh: Unless otherwise approved shall be supplied in flat sheets only.

.3 Chairs, bolsters, bar supports, side wall spacers and bar spacers:

.1 Provide quantity for strength and support of the construction conditions, so that there is no possibility of displacement or deformation of the reinforcement during construction.

.2 Use plastic chairs and/or sidewall spacers for all concrete.

Acceptable Types as supplied by:

Drummond & Reeves
Acrow Richmond
Superior Concrete

.4 Tie Wires: Annealed wire 1.29 mm [0.05″] diameter (No.16 U.S. Standard Gauge), or heavier or an approved proprietary system.

.5 Provide all necessary support bars and spacers in accordance with recommendations of the RSIC Manual.

.3 READY MIX CONCRETE:

.1 Unless otherwise specified, concrete shall be premixed, quality controlled conforming to CSA A23.1 with minimum 28 day compressive strengths as noted on the drawings.

.2 Cement shall be Portland Cement of Canadian manufacture conforming to CSA A3000, Type GU (10).

.3 Supplementary Cementing Materials shall conform to the requirements of CSA A3000.

.4 Aggregates shall be clean, uncoated sand and coarse aggregates from approved sources conforming to CSA A23.1. Nominal size of coarse aggregate shall not exceed 20 mm [3/4″] unless otherwise stated on the structural drawings or specifications.

.5 Water shall be potable from a municipal supply.

.6 Chemical Admixtures, where permitted shall conform to the requirements of CSA A23.1.

.1 Provide an approved water-reducing agent in all concrete.
Acceptable Types:

EUCON WR ..... by Euclid
WRDA 82 ..... by Grace
PLASTOCRETE 161..... by Sika
MASTERSET R 100 ..... by BASF
MASTERPOZZOLITH 210 ..... by BASF

.2 High Range Water Reducing Admixture (Super P)
Acceptable Types:

EUCON 37..... by Euclid
WRDA 20 ..... by Grace
SIKAMENT 686..... by Sika
MASTERRHEOBUILD 1000 ..... by BASF
MASTERGLENIUM 51..... by BASF

.3 Mid-Range Water Reducing Additive where approved for use:
Acceptable Types:

MASTERPOLYHEED 1020 ..... by BASF
EUCON MR ..... by Euclid
DARACEM 55 ..... by Grace
SIKAMENT 500..... by Sika

.4 Air-Entraining Agent:
Acceptable Types:

EUCON AIR MAC6..... by Euclid
DARAX AEA ED..... by Grace
SIKA AIR ..... by SIKA
MASTERAIR ..... by BASF

.7 Calcium chloride or chloride based admixtures **shall not** be used.

.8 Salt or other chemicals shall not be added to reduce the freezing point of concrete.

.9 All admixtures shall be used in strict accordance with the manufacturers' instructions.

.10 SYNTHETIC FIBRE REINFORCING

.1 Synthetic Fibre Reinforcing to control plastic shrinkage cracking: 100% virgin polypropylene fibres specifically manufactured for concrete reinforcement and containing no reprocessed materials. Fibres to be added at the concrete batching plant at the rate of 0.9 kg/m³ [1.52 lb/yd^3] of concrete for defibrillated fibres and 0.6 kg/m³ [1.01 lb/yd^3] for monofilament fibres, unless otherwise noted, in strict accordance with manufacturer's instructions.

Acceptable Types:

PSI FIBRESTRAND 150 ..... by Euclid
SIKAFIBER PPF-50 mm..... by SIKA Canada Inc.
MICROFIBRE..... by Grace
MASTERFIBER..... by BASF

.11 Typical Concrete Mixes: See schedule on drawings.

.4 CONSTRUCTION GROUTS: Non-shrink grout unless otherwise noted shall be a premixed non-metallic, non-shrink grout.

Acceptable Types:

EUCO NS OR DRY PACK GROUT ..... by Euclid
M-BED STANDARD..... by Sika
MASTERFLOW 555..... by BASF
CG-86 ..... by W.R. Meadows
CPD NON-SHRINK GROUT ..... by CPD

.5 CURING, SEALING AND/OR CURING/SEALING COMPOUND where approved for use shall conform to ASTM C309.

.1 Acceptable Types:

MASTERKURE CC 300 XS..... by BASF
FLORSEAL WB 25..... by Sika
SUPER DIAMOND CLEAR 350..... by Euclid
CS-309-30..... by W.R. Meadows
ACRYLIC CURE & SEAL 30%..... by CPD
Compounds must be compatible with applied finishes.

.2 Compound used for Coloured Surface Hardened Finishes shall be:

.1 SUPERDIAMOND (CLEAR) 350 FOR SURFLEX…by Euclid
.2 FLORSEAL WB25 (CLEAR) FOR COLORPLETE…by Sika
.3 MASTERKURE CC 300 XS..... by BASF

.3 For LEED Projects, use:

EVERCLEAR VOX ..... by Euclid
VOCOMP 25 ..... by W.R. Meadows

.4 Compounds applied at the rates as recommended by the manufacturers.

.6 PRE-MOULDED JOINT FILLERS: Provide bituminous impregnated fibreboard conforming to ASTM D1751.

Acceptable types:

FIBRE EXPANSION JOINT FILLER ..... by W.R. Meadows
CPD ASPHALT FIBRE EXPANSION JOINT FILLER ..... by CPD

.7 JOINT FILLER FOR "SAW-CUT" CONTROL JOINTS: Two component self-leveling sealant, minimum Shore A Durometer hardness of 80 at 20°C [68°F] as conforming to ASTM C661.

Acceptable types:

MASTERSEAL CR 190 ..... by BASF
EUCO QWIKJOINT UVR ..... by Euclid
LOAD FLEX POLYUREA ..... by Sika
REZI-WELD FLEX..... by W.R.Meadows
CIPADAM E-13 ..... by CPD

.8 Other materials or products which are not listed herein shall comply with the latest CSA, ASTM, CGSB, or ACI Standards appropriate to those materials.
Refer to **Source Quality Assurance** in **PART 1** of this section.

PART 3 – EXECUTION

3.1 Work by this Section as Supplied by Others

.1 Install anchors and other items to be cast into the concrete as supplied by others.

3.2 Formwork

.1 Formwork design, materials, and erection shall conform with CSA A23.1 including all falsework and ties.

.2 Column and wall footings and caps shall have plywood side forms. The placement of footings directly against neat cut excavations may be approved subject to review and acceptance by the Structural Consultant. Approval to proceed must be given in writing by the Structural Consultant before any concrete is placed.

3.3 Reinforcing Fabrication and Placement

.1 Conform to CSA A23.1.

3.4 Concrete

.1 Mixing, Transportation and placement to conform to CSA A23.1.

.2 Maximum time between adding mix water and complete discharge of concrete into forms shall be 120 minutes. Exemptions to this time frame shall only be permitted with approval by the Structural Consultant when previously approved chemical additives are used.

.3 Approved synthetic fibres to be added to the concrete for slabs where noted on drawings. Refer elsewhere in this section for dosage rates and superplasticizers.

3.5 Cold Weather Conditions

.1 When the air temperature is at or below 5°C [41°F] or when there is a probability of its falling to that limit within 24 hours of placing (as forecast by the nearest weather office).

Conform to the requirements of CSA A23.1 including, but not limited to the following:

.1 Job Preparation.

.2 Concrete Temperature.

.3 Concrete Placing.

.4 Protection Requirements and Methods:

.1 Heated Enclosures.
.2 Protective Covers and Insulation.

.5 Cooling after protection.

.6 Cold-Weather Curing.

.2 All materials and equipment needed for adequate protection and curing shall be on hand and ready for use before concrete placement has started.

3.6 Hot Weather Protection Requirements

.1 Conform to the requirements of CSA A23.1.

3.7 Finishing Treatment of Slab Surfaces (Screeding and Trowelling)

.1 Screeding, Bull Floating, Darbying, Trowelling.

.1 Conform with the requirements of Clause 7.6 of CSA A23.1 and as modified hereinafter.

.2 Bring tops of floors to even level or sloping surfaces as shown on the drawings.

.3 Slabs shall be finished only when bleed water on the slab surface has evaporated.

.4 Machine trowel all floor slabs, except as required by the drawings and/or specifications to Class A Conventional (Smooth) classification.

.5 Surfaces of exterior exposed steps and platforms shall be finished with a wood float and given a "fine broom" finish to the Consultant's satisfaction. (Class A Conventional (Smooth) classification). Refer also to Architect's "Finish Schedule".

.6 Unless otherwise shown or specified, roof slabs shall be finished for waterproofing with a Steel Trowel Finish. (Class A Conventional (Smooth) Classification).

.7 Floors to receive separate finishes shall be screeded to proper elevation, and wood float finished. (Class A Conventional (Smooth) Classification).

.8 Class A Conventional (Smooth) Classification shall be as defined in CSA A23.1 Table 21 and shall be determined by F-number method as defined in Clause 7.6.1.1 unless otherwise directed.

.9 Finished surfaces not conforming to the specified tolerances shall be deemed as **Defective Concrete**. See later in this section.

.2 **Slab-On-Grade**

.1 READY MIX CONCRETE

.1 Refer to drawings and also to **Materials** in this section.

.2 Synthetic Fibres: Refer to READY MIX CONCRETE earlier in this section.

.3 Superplasticizer

.1 Where shown on the drawings and specifications as slabs to have superplasticizer added to the mix, the approved superplasticizing agent can be added at the site or at the plant subject to the appropriate mix design being submitted for review and approval issued by the consultant. NO WATER IS TO BE ADDED AT SITE.

.2 As an alternative, the specified Mid-Range Water Reducing additive, added at the batching plant, may be approved for use. Subject to the appropriate mix design being submitted for review and approval issued by the Consultant.

.4 Quantities and procedure for admixtures shall be determined and supervised with the assistance of the manufacturer's technical staff.

.2 EXECUTION

.1 Refer to **Field Quality Control** later in this section.

.2 Obtain Geotechnical Consultant's approval of the granular fill before placing the concrete slabs-on-grade.

.3 Provide screeds set to an engineer's level for leveling the surface of floor slabs-on-grade.

.4 Provide keys or dowels at construction joints as detailed on the drawings.

.5 CONTROL JOINTS

.1 Where shown on plans or on Typical Details, provide saw-cut control joints as indicated.

.2 Control joints in slabs-on-grade shall be cut using power driven abrasive or diamond tipped blades.

.3 Cutting shall begin as soon as the concrete surface has hardened sufficiently to resist raveling as the cut is made and before shrinkage cracks form in concrete. Generally, saw-cutting of slabs-on-grade shall be done within the first 24 hours after the slabs are placed. Alternatively, use the Soff-Cut method immediately after finishing the slab.

.4 The depth of control joints shall be one-third (1/3) of the thickness of the slab, with a minimum of 40 mm [1.5″] unless otherwise noted.

.5 Clear saw-cuts of all debris and ensure sides are clean and dry before proceeding.

.6 Mix saw-cut joint filler according to manufacturer's instructions.

.7 Pour filler into joints, flush with adjacent surfaces.

.3 **Surface Hardened Finishes**

.1 For slabs designated to be surface hardened, apply the specified surface hardener in strict accordance with the manufacturer's instructions at a rate of 5.0 kg/m² [1.00 lb/ft²].

3.8 Finishing of Formed Surfaces

.1 Conform to the requirements of CSA A23.1 Clause 7.9.

.2 Refer to Architectural Finish Schedules and Drawings.

.3 Refer to **Architectural Quality Concrete** later in this section.

3.9 Sealing and Curing

.1 Apply specified compounds in strict accordance with manufacturer's directions.

.2 All floor slabs and all EXPOSED concrete surfaces, such as walls, beams, columns, etc., are to receive a minimum of one coat of curing and sealing compound unless not compatible with architectural finishes.

.3 CURING

.1 Conform to the requirements of CSA A23.1 including but not limited to the following:

.1 Basic curing period.

.2 Additional curing for durability.

.3 Additional curing for structural safety.

.4 Methods for curing.

.5 Cold weather curing.

.6 Hot weather curing.

.7 Curing for Accelerated Strength Development.

.4 Refer also to **Cold Weather Conditions** and **Hot Weather Protection Requirements,** elsewhere in this section.

3.10 Protection of Slab Surfaces

.1 Fully protect exposed concrete finishes from damage and staining.

.2 Protect all exposed surfaces from dropping plaster, welding debris, paint, dirt or other marring agents, by heavy building paper, tarpaulins or other appropriate means. The surface must be perfectly dirt-free before this protection is placed.

.3 Do not allow any pipe threading or similar machines using oil or other permanently staining liquid on any concrete floor unless set up on large oil-tight and properly constructed metal pans. Plywood sheets or other absorbent materials will not be permitted as a substitute for pans.

3.11 Miscellaneous Items

.1 This section to provide and place concrete, formwork and reinforcing and/or grout fill for all concrete work shown on or implied by the drawings and specifications.

.2 DRY-PACK GROUT: Provide and install specified non-shrink grout as required, in accordance with manufacturer's directions.

.3 REINFORCED MASONRY LINTELS: Where required, provide reinforcing and place concrete in accordance with the Typical Notes and Details on the drawings.

.4 VERTICAL MASONRY WALL REINFORCING BARS: Provide, for installation by the Mason, bars as required by the drawings and typical details.

.5 MASONRY GROUT: Co-ordinate with the Mason for supply and installation of grout. Grout as specified on the drawings.

.6 BONDING AGENT: Provide and install specified agent as required in accordance with manufacturer's directions.

.7 DRILLED AND SET ANCHORS AND DOWELS:

Provide and install the specified products and materials as required in accordance with manufacturer's directions.

3.12 Toppings

.1 General

.1 Conform to CSA A23.1 and the requirements noted below, unless noted otherwise in the contract documents.

.2 Set screeds and bulkheads rigidly and accurately to prevent displacement during concreting.

.3 Special provisions for unbonded toppings:

.1 The maximum pour size for bonded and unbonded toppings is to be limited to [1400 m^2] 15000[ft^2].

.2 Maintain a one to one length to width aspect ratio for all pours, here extent and geometry of topping permits.

.3 Ensure temperature of base course is 10°C (50°F) minimum prior to pouring toppings.

.4 Provide hot and cold weather protection for toppings in accordance with CSA A23.1.

.2 Bonded Toppings

.1 Bonded toppings are constructed by applying the topping mixture over a hardened concrete. By definition, bonded toppings are designed to bond to the concrete base or an existing concrete surface.

.2 Materials:

.1 Concrete: Refer to concrete mix schedule on the drawings. (Maximum coarse aggregate to be 10 mm [3/8″]).

.2 Shrinkage Reducing Additive: Use Eucon SRA or an approved equivalent at the rate of 2% by weight of cementitious materials.

.3 Base Course Finishing and Preparation

.1 Base Course Finishing and Preparation

.1 Base Courses Which Are To Receive Bonded Toppings Are To Be Finished By One Of Two Methods:

1. rough broom finish (very rough finish – amplitude ± 6mm/± ¼”).

2. Finish as defined within the precast hollow core shop drawings.

.2 When a rough broom finish is provided, the slab surface is to be cleaned by high-pressure water blasting to ensure all laitance, dirt, dust, construction debris and the like are removed prior to application of the concrete topping.

.4 Placing and Finishing Toppings

.1 Place and finish toppings in accordance with CSA A23.1

.5 Curing

.1 Continuously wet cure bonded toppings for a minimum of seven days.

.6 Jointing

.1 Bonded toppings do not require special provisions with respect to jointing provided all the provisions noted above are adhered to.

.2 The location of joints in the topping shall match those in the base course.

.3 Cracks in Toppings

.1 All cracks in concrete toppings must be repaired by the Contractor. Extent of repair and method of crack repair must meet the requirements of flooring installation contractor and the Owner.

3.13 Architectural Quality Concrete

Where concrete surfaces are denoted as Architectural Quality or Architectural Finished Concrete, comply with the following:

.1 Refer to MATCH SAMPLE FOR ARCHITECTURAL QUALITY CONCRETE earlier in this section.

.2 Use same formwork and joint sealing on final work as was used on "Match" sample.

.3 Conform with the requirements of CSA A23.1 Clause 8.3 and ACI 303.

.4 DESIGN

.1 The mix shall be designed by the Contractor so that it will achieve all the properties specified and in addition will achieve a high workability.

.2 Regardless of specified strength, architectural concrete exposed to weather shall have a maximum water cement ratio of 0.48 by mass.

.3 The maximum slump permitted is 90 mm [3.5″].

.4 Take care to reduce variation in mix proportions and particularly the quality of water used in various batches, in order to ensure reasonable colour uniformity of concrete.

.5 Architectural quality concrete shall meet the standards set out below when the forms are stripped, without further finishing work other than treatment of tie holes and clean-up:

.1 Dense, even concrete, uniform in colour and free of defects such as colour change, honeycombing, voids, loss of fines, flow lines, cold joint lines or other similar imperfections. Patching, unless it is required to only an insignificant extent, will not be permitted to repair these defects. Where patching is permitted, it must accurately match the colour and texture of the surrounding concrete to be acceptable. The judgement as to what constitutes insignificant defects which may be patched and the acceptance of the patch shall be made solely by the Architect.

.2 Concrete members of generally uniform colour.

.3 Concrete members with true, accurate definition at corner, arises, reglets and the like, generally free of chipped or spalled areas and within dimensional tolerances set out in ACI 303.

.4 Weathertight construction joints in members exposed to weather.

.5 Under no circumstances shall patches or repair to any architectural concrete be undertaken without the Architect's written consent. Concrete members which are patched without the Architect's consent will be classified as defective work and the Architect may require their removal and replacement.

.6 Colour and texture matching the sample panel designated by the Architect.

.6 FORMS

.1 Use approved cone type form ties, spaced as required by the Architect. Align vertical and horizontal form panel joints.

.2 Seal joints on exterior side between form panels with an approved joint seal and securely fasten 25 x 50 mm [1″ x 2″] wood battens over each joint seal.

.3 Provide formwork for reveals as detailed on the architectural drawings to the Architect's satisfaction.

.7 SANDBLAST FINISH: Where denoted.

.1 Sandblast the exposed surface of concrete members as required to a depth sufficient to at least remove the surface skin and expose the coarse aggregate and match the approved sample designated by the Architect.

.2 Sandblast individual concrete members at the same age to ensure reasonable colour uniformity. Protect adjacent surfaces not noted to be sandblasted.

.3 Do not proceed with sandblasting operations until the Architect has inspected and approved the surfaces to be sandblasted.

.8 When specified or shown on the drawings fill form tie holes with Mills gray concrete plugs in strict accordance with the manufacturer's recommendations.

3.14 Defective Concrete

.1 Concrete not meeting the requirements of the specifications and drawings shall be considered defective concrete.

.2 Defective concrete and concrete not conforming to lines, details, quality and grade specified or as shown on the Drawings shall be modified or replaced at no extra cost to the Owner, and to the satisfaction of the Architect.

.3 Finished lines, dimensions and surfaces shall be correct and true within tolerances specified.

.4 Non-exposed Surfaces: Honeycombing shall be cut out and filled and any fins which interfere with strapping, etc., shall be cut back. Holes left by form separators shall be filled.

.5 Crack Repair: After concrete has cured, examine concrete floor surfaces and repair all cracks. Route out cracks with mechanical router to a minimum depth of 13 mm [1/2″]. Then clean and fill cracks in same manner as control joints.

.6 Use approved curing/sealing compound in strict accordance with manufacturer's recommendations.

3.15 Quality Control

.1 Implement a system of quality control to ensure that the minimum standards specified herein are attained.

.2 Bring to the attention of the Consultant any defects in the work or departures from the Contract Documents which may occur during construction. The Consultant will decide upon corrective action and give recommendations in writing.

.3 The Consultant 's general review during construction and inspection and testing by Independent Inspection and Testing Companies reporting to the Consultant are both undertaken to inform the Consultants of the Contractor's performance and shall in no way augment the Contractor's quality control or relieve the Contractor of contractual responsibility. The contractor is solely responsible for quality control and shall implement its own supervisory and quality control procedures.

.4 Refer to **Source Quality Assurance** included in this section.

.5 If requested, provide a copy of the Concrete Suppliers Certificate confirming that the specified fibre reinforcement at the specified dosage was added to all required concrete delivered to the job site.

3.16 Notification

1. Prior to commencing significant segments of the work, give the Consultant and Independent Inspection and Testing Companies appropriate notification so as to afford them reasonable opportunity to review the work. Failure to meet this requirement may be cause for the Consultant to classify the work as defective. . A minimum notification of 24 hours in advance of placing concrete is required.

3.17 Inspection and Testing

1. The General Contractor in agreement with the Halton Catholic District School Board will appoint an Independent Inspection and Testing Companies to make inspections or perform tests as the Consultant directs. The Independent Inspection and Testing Companies shall be responsible only to the Consultant, and shall make only such inspections or tests as the Consultant may direct. The representative of the Inspection and Testing Company shall NOT be required to supervise or instruct the Contractor.

2. The Inspection and Testing Company will conduct inspection and testing services per Specification Section 01 45 23 – *Testing and Inspection Services – General Requirements*

3. The following are responsibilities of the contractor regarding the Inspection and Testing Company:

   .1 Co-operate with the representatives of the Inspection and Testing Company.

.2 Provide the Inspection and Testing Company with a set of construction documents to enable them to understand the scope of their services.

.3 Provide an insulated storage box according to the specification and drawing supplied by the Inspection and Testing Company.

.4 Protect test cylinders.

.5 Keep a record set of drawings upon which shall be marked by the contractor's superintendent, the time and date of pouring of each section of concrete, the date of removal of forms and a daily record of the temperature.

3.18 Defective Materials and Work

.1 Where evidence exists that defective work has occurred or that work has been carried out incorporating defective materials, the Consultant may have tests, inspections or surveys performed, analytical calculations of structural strength, made and the like, in order to help determine whether the work must be corrected or replaced. Tests, inspections or surveys or calculations carried out under these circumstances will be made at the Contractor's expense, regardless of their results, which may be such that, in the Consultant's opinion, the work may be acceptable.

.2 All testing shall be conducted in accordance with the requirements of The Building Code, except where this would, in the Consultant's opinion, cause undue delay or give results not representative of the rejected material in place. In this case, the tests shall be conducted in accordance with the standards given by the Consultant.

.3 Materials or work which fail to meet specified requirements may be rejected by the Consultant whenever found at any time prior to final acceptance of the work regardless of previous inspection. If rejected, defective materials or work shall be promptly removed and replaced or repaired to the satisfaction of the Consultant, at no expense to the Owner.

END OF SECTION 03 30 53

Part 1 General

1.1 SECTION INCLUDES

.1 Materials and installation for concrete floor hardeners, slip resistant coatings, and sheet curing materials.

1.2 RELATED SECTIONS

.1 Section 01 33 00 - Submittal Procedures.

.2 Section 01 51 00 - Temporary Utilities.

.3 Section 03 33 00 – Cast-in-Place Concrete.

1.3 REFERENCE STANDARDS

.1 Health Canada - Workplace Hazardous Materials Information System (WHMIS)

.1 Material Safety Data Sheets (MSDS).

.2 CSA-A23.1-09: Concrete Materials and Methods of Concrete Construction

1.4 SUBMITTALS

.1 Submit product data in accordance with Section 01 33 00 - Submittal Procedures.

.2 Submit WHMIS MSDS - Material Safety Data Sheets in accordance with Section [02 61 33 - Hazardous Materials].

.1 WHMIS MSDS acceptable to Human Resources Development Canada-Labour and Health Canada for concrete floor hardeners.

.2 Indicate VOC content.

1.5 WASTE MANAGEMENT AND DISPOSAL

.1 Remove from site and dispose of packaging materials at appropriate recycling facilities.

.2 Collect and separate for disposal [paper] [plastic] [polystyrene] [corrugated cardboard] packaging material [in appropriate on-site bins] for recycling.

.3 Dispose of unused chemical additive materials at an official hazardous materials collections site approved by Consultant.

.4 Unused chemical additive materials must not be disposed of into sewer system, into streams, lakes, onto ground or in other location where it will pose health or environmental hazard.

.5 Fold up metal banding, flatten and place in designated area for recycling.

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.6 Dispose of unused chemical additive materials at an official hazardous materials collections site approved by Consultant.

1.6 ENVIRONMENTAL REQUIREMENTS

.1 Temporary lighting

.1 Minimum 1200 W light source, placed 2.5 m above floor surface, for each 40 m^2 of floor being finished.

.2 Electrical power

.1 Sufficient electrical power to operate equipment normally used during construction.

.3 Work area

.1 Water tight protection against rain and detrimental weather conditions.

.4 Temperature

.1 Maintain ambient temperature of not less than [10] degrees C from [7] days before installation to at least 48 hours after completion of Work and maintain relative humidity not higher than 40% during same period.

.2 Maintain substrate temperature at [10] degrees C minimum.

.5 Moisture:

.1 Ensure concrete substrate is within moisture limits prescribed by [flooring] manufacturer.

.6 Safety:

.1 Comply with requirements of Workplace Hazardous Materials Information System (WHMIS) regarding use, handling, storage, and disposal of hazardous materials.

.7 Ventilation:

.1 Ventilate area of work as directed by Consultant by use of approved portable supply and exhaust fans.

.2 Ventilate enclosed spaces in accordance with Section 01 51 00 - Temporary Utilities.

.3 Provide continuous ventilation during and after coating application.

.4 Sufficient to prevent carbon monoxide or high levels of carbon dioxide and other injurious gases from affecting concrete.

1.7 SCOPE OF WORK

.1 Provide liquid hardener at all concrete exposed slab-on-grade areas where exposed concrete is indicated on architectural drawings or in room finish schedule.

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Part 2 Products

2.1 FLOOR HARDENER

.1 Where concrete curing agent/sealer/hardener is specified on drawings, provide Shur-Seal as manufactured by Paul M. Wolff Co. Inc. (714) 974-0630, Sure Hard manufactured by Dayton Superior's Canada ltd or Liqui-Hard by W.R. Meadows.

Part 3 Execution

3.1 EXAMINATION

.1 Examine area and conditions under which the work of this Section will be performed. Correct conditions detrimental to timely and proper completion of the work and which do not conform to manufacturer's recommendations. Do not proceed until unsatisfactory conditions have been corrected.

3.2 INSTALLATION

.1 On freshly painted concrete surfaces, no additional surface preparation will be required.

.2 On areas where forms are recently removed, remove all form oil and breaking compound residue to assure penetration of the product into the surface.

.3 When applying near windows, mask the glass.

.4 Avoid contact with plant life, glass, aluminum, and other finished surfaces. Where contact occurs, immediately wipe with a damp cloth or flush with water.

.5 Avoid contact with asphaltic concrete.

.6 On previously sealed existing concrete floors, completely strip floor of sealers and contaminants prior to application. Apply as for freshly painted surfaces.

3.3 APPLICATION REQUIREMENTS

.1 Two applications are required. The first application at 200 ft□/gallon as the curing agent at the time of concrete placement. The second application at 400 ft¯/gallon as final coat after final cleaning of the concrete.

3.4 APPLICATION

.1 Curing Application:

.1 Application should be made immediately following the final concrete finishing operation as soon as the concrete is firm enough to work on. This will help prevent temperature and hairline cracking.

.2 Application shall be made with low pressure spray. All concrete surfaces shall be kept wet for 30-45 minutes.

□

.3 After this period, when the treated surfaces become slippery under foot, lightly sprinkle the surfaces with water to aid penetration.

3.5 FINISH APPLICATION

.1 Apply sealer with low pressure sprayer at 400 ft^2/gallon coverage rate.

.2 Lambs wool or fine bristle broom the sealer evenly across the concrete surface. Do not allow pudding.

.3 Allow sealer to dry into the surface after 30 minutes.

.4 Keep standing water off concrete surface for 30 days. Do not wet scrub for 30 days.

END OF SECTION

□

PART 1 – GENERAL

1.1 General Requirements

.1 Make a thorough examination of the drawings, site, specification and soil report, to determine the intent, extent, materials and conditions of interfacing with other work and to be fully cognizant of the requirements.

.2 Assume full responsibility for the design, for the adequacy and for the safety of all formwork and falsework.

.3 The Contractor shall ensure that no asbestos containing materials are used in connection with the work of this section.

1.2 Reference Standards

.1 Comply with The Building Code Act, as amended, the 2024 Ontario Building Code (OBC) as amended and Regulations and by-laws of other authorities having jurisdiction, including latest amendments thereto; all hereafter referred to as Building Code.

.2 All codes, standard specifications and by-laws referred to in this Specification shall be current editions including all latest revisions, addenda and supplements, unless otherwise noted in the Building Code.

.3 Conform to the following CSA Standards:

.1	A23.1	Concrete Materials and Methods of Concrete Construction.
.2	A23.2	Test Methods and Standard Practices for Concrete.
.3	A23.3	Design of Concrete Structures.
.4	A23.4	Precast Concrete - Materials and Construction.
.5	A3000	Cementitious Material Compendium.
.6	G30.18	Carbon Steel Bars for Concrete Reinforcement.
.7	W48.....	Filler Metals and Allied Materials for Metal Arc Welding.
.8	W186.....	Welding of Reinforcing Bars in Reinforced Concrete Construction.

.4 In the event of conflict between reference standards, codes, drawings and specifications, the Contractor shall request clarification by the Consultant. The Consultant's decision as to which requirements govern shall be final and binding. Generally the more stringent provision shall govern. No extras to contract will be approved due to such clarification.

1.3 Shop Drawings

.1 Submit shop drawings and design calculations in accordance with directions. Each sheet submitted shall bear the stamp of a Professional Engineer licensed in Ontario.

.2 Submit erection drawings and details showing general arrangement, size, shape, unit identification marks and location of slabs and installation data, such as method and sequence of erection, connection methods, joint and grouting details, camber, apertures and other data necessary to any trade working on or adjacent to installed slabs and which is part of work of the manufacturer.

.3 Shop drawings shall show accommodation for all electrical services, sleeves, etc.

.4 Review of shop drawings shall not relieve the Contractor from the responsibility of seeing that the work is complete, accurate and in conformity with the Architectural and Structural drawings and the Specifications. Shop drawings shall be checked and initialed by the Contractor's staff before being submitted.

.5 Only shop drawings bearing the review stamps shall be kept at site.

1.4 Source Quality Assurance

.1 The manufacturer and erector shall have a minimum of five (5) years of experience on projects of similar size and scope. If requested, the manufacturer and erector shall provide documentation to references including contact names and phone numbers.

.2 Manufacturer and erector of precast elements shall comply with CSA A23.4.

.3 Upon request, provide Consultant with certified copies of quality control tests and inspection related to this project as specified in CSA A23.4.

.4 Upon request, provide Consultant with certified copy of mill test report of reinforcing strands supplied, showing physical and chemical analysis.

1.5 Warranty

.1 The Contractor hereby warrants that the precast elements will not spall or show visible evidence of cracking, except for normal hairline shrinkage cracks, in accordance with GC24, except for five (5) years after completion.

1.6 Design Criteria

.1 Design precast elements to CSA A23.3 and to carry handling stresses.

.2 Design loads in accordance with applicable codes for use and occupancy, wind, temperature and earthquake, and as shown on the structural drawings.

.3 Design precast planks to the thickness indicated on the drawings, with a maximum design camber under self-weight of 30 mm. Increase the plank thickness as required to achieve a maximum design camber under self-weight of 30 mm.

.4 Design precast slabs to meet a two (2) hour fire resistance rating.

.5 Consider vibration characteristics in accordance with the Ontario Building Code.

.6 If any aspect of the precast hollow core slab construction, proposed by the Contractor for use on this project and/or as required by the final design requirements of the precast hollow core slab system varies from that shown on the tender drawings and the variation requires the re-design of the base building elements and/or the revision to or addition of materials to accommodate such variance and the Owner, the Architect and the Structural Consultant are in agreement with the proposed variation, then the Contractor and/or the precast hollow core supplier requesting the variation shall pay for all costs, including re-design associated with the change.

PART 2 – PRODUCTS

2.1 Materials

.1 Cement aggregates, water, admixtures to conform to CSA A23.1 and CSA A23.4.

.2 Concrete shall have a minimum compressive strength of 30 MPa [4.35 ksi] at transfer, and 40 MPa [5.80 ksi] at 28 days.

.3 The prestress strands shall be uncoated 7-wire cable conforming to ASTM A416/A416M.

.4 Grout Mix: Cement grout of one (1) part type 10 Portland cement, 2 ½ parts sand, and sufficient water for placement and hydration or as specified by the Precast Manufacturer.

.5 Bearing Pads: 3 mm [0.12″] Masonite smooth one side.

.6 Reinforcing Steel shall conform to CSA G30.18.

.7 Anchorages and Couplings: To CSA A23.1.

.8 Embedded Steel: To CSA G40.20/G40.21.

.9 Welding Materials: To CSA W48.

PART 3 – EXECUTION

3.1 Fabrication and Erection

.1 All prestressed hollow core units shall be manufactured using machines castings techniques in a closely controlled manufacturing process.

.2 Erection shall be carried out by experienced precast erectors under supervision of the manufacturer.

.3 Bearing surfaces prepared by others shall be examined and approved by the manufacturer of the prestressed hollow core slabs.

.4 Commencement of erection implies acceptance of the work of other sections which affect the work of this section.

.5 No relief from contractual responsibility will be allowed unless such claim is made in writing prior to commencement of work.

.6 Install 3 mm [0.12″] Masonite pads, smooth side up on bearing ends of masonry.

.7 TOLERANCES

.1 Conform to tolerances specified in CSA A23.4 including but not limited to the following:

.1 Depth (thickness of slabs)

The maximum variation from the specified depth shall be …± 5mm [3/16″]

.2 Length (As shown on reviewed shop drawings)

The maximum variation from the required length shall be:

.1 Lengths up to and including 7.2 m [23′-8″] ..... ± 12mm (± ½″)
.2 Lengths greater than 7.2 m [23′-8″] ..... ± L/600

Regardless of the variation specified above, the length of bearings of the precast slabs on supporting elements shall not be reduced from the minimum shown on the construction documents.

.3 Squareness and Plumbness

.1 Variation from square or specified angle at ends of precast slabs..... Max. 1 in 200

.4 Alignment of Longitudinal Edges

.1 The maximum variation in alignment between two adjacent slabs shall be L/600 or 5 mm [3/16″].

.5 Camber

.1 The maximum variation from design camber shall be L/1000, but not greater than 10 mm [3/8″].

.2 The maximum differential camber between adjacent slabs shall be L/1000 but not greater than 12 mm [½″].

.3 Refer to **Topping** paragraph later in this section.

.8 Slabs shall be grouted using a grout mixture as specified by the Precast Manufacturer.

.9 Due care shall be exercised to ensure that joints between the slabs are completely filled.

.10 Install insulation plugs in each cell at exterior conditions.

.11 Caulking of exposed ceiling joints shall be done using material as specified. Caulk joints between underside of the hollow core slabs and the top of the supporting elements, at both end and side conditions. Refer to Architectural Drawings for the locations. Caulking material to be compatible with applied finishes.

.12 The Contractor shall provide suitable surfaces as follows:

.1 A suitable top finish to accept direct application of finished flooring/roofing as specified on Architectural drawings.

.2 Where the undersides of the precast units are exposed and are designated to receive a painted finish, provide a surface which conforms to CSA A23.4. (Standard finish).

.3 The top surfaces to receive a bonded topping are to be scratched (roughened).

.13 Protection: Provide suitable temporary protection/coverings for cells which may be exposed to the elements during construction.

3.2 Topping

.1 Where concrete topping is specified to be provided, refer to Section 03 30 53 Cast-in-Place Concrete. Topping is bonded and non-composite and shall be placed with top surface flat.

.2 If precast hollow core slab designer requires topping to perform with composite action, all details, including but not limited too reinforcing and top of slab finishes to suit the requirements of a bonded composite topping shall be designed and specified by the precast hollow core slab designer/supplier.

.3 Where no concrete topping is provided and the camber differential exceeds 10 mm [3/8″] the Precast Supplier shall provide a "feathering-out" topping underlayment between the slabs. This "feathering- out" shall be to the satisfaction of the Architect.

3.3 Relation to Other Trades

.1 Provide information to all trades required to fix or suspend ceilings, lighting fixtures, ducts, piping, windows, curtain walls, etc. to precast elements. Information shall show methods and locations acceptable to the precast manufacturer.

.2 Coordinate with trades that are required to run services horizontally in the cells of the precast units.

.3 Holes

.1 Field cutting for holes through precast elements shall be only done with the express approval of the Precast Manufacturer and the Consultant.

.2 Prior to field cutting or drilling of holes through precast slabs, a drawing shall be prepared by the Contractor showing locations and sizes of holes. This drawing is to be reviewed and approved by the Precast Supplier's Engineer. A copy of this Engineer's approval is to be submitted to the Architect and Structural Consultant for review and acceptance before field cutting proceeds.

.4 The precast hollow core supplier shall supply in fill cast-in-place concrete, including formwork, and reinforcing as required for installation by the concrete installer, (co-ordinate with the concrete sub-Contractor as required) or alternatively the precast supplier shall provide precast elements sized to suit the conditions.

3.4 Defective Work

.1 Precast concrete not meeting the requirements of the specifications and drawings shall be considered defective work.

.2 Defective work and work not conforming to lines, details, quality and grade specified as shown on the drawings shall be modified or replaced at no cost to the Owner, and to the satisfaction of the Architect.

.3 Finished lines, dimensions and surfaces shall be correct and true within tolerances specified.

.4 Testing from areas in question, as directed by the Structural Consultant and in accordance with CSA Standard A23.1 and/or load testing of the structural elements in accordance with the requirements of the Structural Consultant shall be done at no cost to the Owner.

.5 REPAIRS:

.1 COSMETIC REPAIRS

.1 Before any steps are taken to repair surface defects they shall first be inspected by the Architect who shall state whether or not repair treatment shall be undertaken.

.2 Should the Architect determine that the defects be too serious for repair, or should repairs prove unacceptable, the effected unit shall be removed from the site and replaced with a new unit at no cost to the Owner.

.2 STRUCTURAL REPAIRS

Repairs of a structural nature shall not be undertaken until the manufacturer's engineer has:

.1 Investigated the structural implications of the defect or damage.

.2 Established the cause of the defect or the damage.

.3 Received approval of the proposed repair procedures from the Structural Consultant.

3.5 Clean-Up

.1 Upon satisfactory completion of the work, clear away from the building and premises all tools, utensils, apparatus, excess or waste materials and debris resulting from the operations, and leave all complete and in a condition acceptable to the Architect.

3.6 Quality Control

.1 Implement a system of quality control to ensure that the minimum standards specified herein are attained.

.2 Bring to the attention of the Consultant any defects in the work or departures from the Contract Documents which may occur during construction. The Consultant will decide upon corrective action and give recommendations in writing.

.3 The Consultant 's general review during construction and inspection and testing by Independent Inspection and Testing Companies reporting to the Consultant are both undertaken to inform the Consultants of the Contractor's performance and shall in no way augment the Contractor's quality control or relieve the Contractor of contractual responsibility. The contractor is solely responsible for quality control and shall implement its own supervisory and quality control procedures.

.4 Refer to Section 03 30 53.

.5 Refer also to **Source Quality Assurance**, in this section.

.6 After completion of the precast slab installation, the precast supplier/engineer shall issue a report signed and sealed by a licensed Professional Engineer certifying that the project was designed, fabricated and installed according to the project contract documents and specifications and the precast shop drawings including **ALL** openings/holes through the slabs.

3.7 Notification

1. Prior to commencing significant segments of the work, give the Consultant and Independent Inspection and Testing Companies appropriate notification so as to afford them reasonable opportunity to review the work. Failure to meet this requirement may be cause for the Consultant to classify the work as defective.

3.8 Inspection And Testing

1. The General Contractor in agreement with the Halton Catholic District School Board and Prime Consultant may appoint an Independent Inspection and Testing Companies to make inspections or perform tests as the Consultant directs. The Independent Inspection and Testing Companies shall be responsible only to the Consultant, and shall make only such inspections or tests as the Consultant may direct. The representative of the Inspection and Testing Company shall NOT be required to supervise or instruct the Contractor.

2. Contractor to cooperate with the representative of the Inspection and Testing Company to facilitate the work.

3. The Inspection and Testing Company will conduct inspection and testing services per the following:

   .1 Specification Section 01 45 23 – *Testing and Inspection Services – General Requirements.*

3.9 Defective Materials And Work

.1 Where evidence exists that defective work has occurred or that work has been carried out incorporating defective materials, the Consultant may have tests, inspections or surveys performed, analytical calculations of structural strength, made and the like, in order to help determine whether the work must be corrected or replaced. Tests, inspections or surveys or calculations carried out under these circumstances will be made at the Contractor's expense, regardless of their results, which may be such that, in the Consultant's opinion, the work may be acceptable.

.2 All testing shall be conducted in accordance with the requirements of The Building Code, except where this would, in the Consultant's opinion, cause undue delay or give results not representative of the rejected material in place. In this case, the tests shall be conducted in accordance with the standards given by the Consultant.

.3 Materials or work which fail to meet specified requirements may be rejected by the Consultant whenever found at any time prior to final acceptance of the work regardless of previous inspection. If rejected, defective materials or work shall be promptly removed and replaced or repaired to the satisfaction of the Consultant, at no expense to the Owner.

END OF SECTION 03 41 13

Part 1 General

1.1 RELATED SECTIONS

.1 This section to be read in conjunction with Section 04 22 00 for Execution Requirements

.2 Section 01 33 00 – Submittal Procedures

.3 Section 03 30 00 – Cast-in-Place Concrete

.4 Section 05 12 23 – Structural Steel for Buildings

.5 Section 03 41 00 – Plant- Precast Structural Concrete

.6 Section 04 22 00 – Concrete Unit Masonry

.7 Section 07 21 13 – Board Insulation

1.2 REFERENCES

.1 American Society for Testing and Materials International (ASTM).

.1 ASTM C126-99, Standard Specification for Ceramic Glazed Structural Clay Facing Tile, Facing Brick, and Solid Masonry Units.

.2 Brick Industry Association (BIA).

.1 Technical Note No. 20-2000, Cleaning Brick Masonry.

.3 Canadian Standards Association (CSA International).

.1 CAN/CSA A82-06: Fired Masonry Brick Made from Clay or Shale
.2 CAN/CSA-A165 SERIES-04 (R2009): Concrete Block Masonry Units
.3 CSA-A371-04 (R2009): Masonry Construction for Buildings
.4 CAN/CSA-A3001: Portland Cement
.5 CSA-A8-M88: Masonry Cement
.6 CSA S304.1-04: Design of Masonry Structures

1.3 SUBMITTALS

.1 Product Data.

.1 Submit manufacturer's printed product literature, specifications and data sheet in accordance with Section 01 33 00 - Submittal Procedures.

.2 Manufacturer's Instructions.

.1 Submit manufacturer's installation instructions.

1.4 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 For clay units, in addition to requirements set out in referenced CSA and ASTM Standards include data indicating initial rate of absorption for units proposed for use.

1.5 PRODUCT DELIVERY STORAGE AND HANDLING

.1 Ensure that materials are delivered to job site in dry condition.

.2 Except where wetting of units is specified, keep materials dry until use.

.3 Store under waterproof cover on pallets or plank platforms held off ground by means of plank or timber skids.

1.6 COLD WEATHER REQUIREMENTS

.1 Supplement Clause 5.15.2 of CSA A371 with the following

.1 Maintain temperature of mortar between 5°C and 50°C until used.

1.7 HOT WEATHER REQUIREMENTS

.1 As per Clause 6.7.4 of CSA A37.

1.8 PROTECTION

.1 Until completed and protected by flashings or other permanent construction, keep masonry dry using waterproof, non-staining coverings that extend over walls and down sides sufficient to protect walls from wind driven rain. Use waterproof coverings draped 600 mm (min.) down each side of wall and securely anchored.

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

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

1.9 WASTE MANAGEMENT AND DISPOSAL

.1 Remove from site and dispose of packaging materials at appropriate recycling facilities.

.2 Collect and separate for disposal paper, plastic, polystyrene, corrugated cardboard, packaging material in appropriate on-site for recycling in accordance with Waste Management Plan.

1.10 JOB MOCK UP

.1 Construct mock-up panel of exterior masonry wall construction, 2000 mm x 2000 mm, showing all masonry materials and colors, fixtures, jointing, coursing, mortar and workmanship.

□

Part 2 Products

2.1 MANUFACTURED UNITS

.1 **Brick Veneer Units**:

.1 All units: 57 mm x 90 mm x 255 or 290 mm (HxDxL) Metric Norman in a smooth finish:

.2 **Masonry Veneer "A"** (Colour **– Red):**

.1 Brampton Brick – Colour VICTORIAVILLE

.2 Canada Brick - Colour VARSITY *(Matt)*

.*3* Shaw Brick (dist. by I.X.L) - Colour 'Max 57' TAPESTRY RED

.3 **Masonry Veneer "B"** (Colour **– Dark Grey):**

.1 Brampton Brick 'Contemporary Series – Colour "RAVEN"

.2 Canada Brick 'Canada Architectural Series' - Colour IRONSTONE

.3 Permacon Melville Norman Brick – Colour ROCKLAND BLACK

.4 All units are to be manufactured from single continuous run to ensure minimum colour and texture variations.

.5 Hollow core units may be used. Provide solid units where required for corners and edges.

.6 Install in a one-third lapped running bond pattern.

.2 **Manufactured Pre-cast (Stone) Veneer:**

.1 Designated as "Masonry Veneer - Stone" or "Pre-cast Veneer" on Architectural Exterior Elevations.

.1 "Vivace Masonry Veneer", by Brampton Brick or approved alternative. Colour to be: "Dover" light grey.

.2 "Lafitt Stone" pre-cast veneer, by Permacon International. Colour to be: "Scandina Grey" light grey.

.2 60% combo, 40% large.

.3 Submit samples and confirm order/delivery schedule to Architect at outset of contract.

.4 All units to be manufactured from single continuous run to ensure minimum colour and texture variations.

.5 Provide special sizes and shapes as required including but not limited to plain ends halves, jambs, sash, lintel, special angle corners and other shapes whether drawn or not. Submit shop drawings of all shapes.

.3 Portland Cement:

.1 To CAN/CSA-A3001.

.4 Masonry Cement:

.1 To CAN/CSA A8.

.5 Hydrated Lime:

.1 To ASTMC207-74.

□

.6 Aggregate:

.1 To CSA A82.56-M1976.

.7 Water:

.1 Ensure that water contains no salts which may cause efflorescence.

.8 Thru-wall Flashing and Air/Vapour Barrier Sheet Membrane Treatment**:** Self-adhering SBS modified bitumen membrane reinforced with non-woven fibrous glass. Acceptable materials: Blueskin TW by Bakor Inc., Mississauga or sheet air/vapour barrier membrane as specified as in Section 07 27 10 – Air Barriers.

.9 Bolts and Anchors: To CAN3-A370.

.10 Natural Mortar:

.1 Generally: Use materials only as specified in CSA A179. Ensure that weather and aggregate used in mortar, other than in walls buried in earth, will not cause efflorescence.

.2 Bonding Agent**:** Acrylic latex type by Sternson Limited, W.R. Meadows or Thoro Building Products. Use for all mortar except clay brick.

.3 Mixes: Mix mortars as specified in CSA A179 using the Proportion Specification. Add bonding agent in accordance with manufacturer's instructions.

.4 Mortar Types:

.1 For masonry walls in contact with earth and bedding for bearing plates and lintels: Mortar Type "S".

.2 For load-bearing walls: Mortar Type "S".

.3 For clay brick: Mortar Type "N" (1:1:6) premixed "Betomix 1-1-6" Type "S" portland cement hydrated lime as supplied by Daubois Inc., Jiffy Mortar Systems. Mix on site with sand and water.

.4 For all other (non-structural) masonry walls, use regular Type "N" mortar.

.5 Grout: To CSA A179 Table 3.

.11 Mortar Dropping Control Device: "Mortar Net" manufactured by Mortar Net USA (Telephone: 1-800-664-6638).

.12 Weepholes**:** 90 mm x 90 mm x 10 mm purpose made PVC, designed to drain cavities and with mesh to prevent insects from entering. Colour to be chosen by Architect from manufacturer's full range.

.13 Date Stone: Date stone to be 390 x 390 x 90 deep solid limestone. Font: Technic Lite, 100mm high. Beveled edges. Polish finish. Location to be determined by Architect.

.14 Veneer Ties: Fero slotted block tie (Type II) c/w V-Tie manufactured from 4.76 mm diameter wire conforming to CSA Standard G30.3, hot dipped galvanized to ASTM A153.

□

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 WORKMANSHIP

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

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

3.3 TOLERANCES

.1 Clause 5.3 of CAN/CSA-A371 applies except as follows: Walls to receive thinset ceramic tile: plumb within 1:600.

3.4 EXPOSED MASONRY

.1 Remove chipped, cracked, and otherwise damaged units in exposed masonry and replace with undamaged units.

.2 Parging on the face of exposed masonry units will be rejected.

3.5 JOINTING

.1 Except where indicated otherwise on drawings or details or as below, make concave joints, allow joints to set just enough to remove excess water, then tool with round jointer to provide smooth, compressed, uniformly concave joints. Where joints are to receive plaster, tile, insulation, or other applied material except paint or similar thin finish coating, strike flush.

3.6 WEEPHOLES

.1 Provide 10 x 90 x 90 mm PVC weepers at regular intervals at both top and bottom of walls as indicated on Drawings. Ensure weepers are clear and not blocked by mortar or mortar droppings.

3.7 JOINING OF WORK

.1 Where necessary to temporarily stop horizontal runs of masonry, and in building corner, Step-back masonry diagonally to lowest course previously laid. Do not "tooth" new masonry. Fill in adjacent course before heights of stepped masonry reach 1200 mm.

3.8 CUTTING

.1 Cut out neatly for electrical switches, outlet boxes, and other recessed or built-in objects.

.2 Make cuts straight, clean, and free from uneven edges. Use masonry saw where necessary.

□

3.9 BUILDING-IN

.1 Build in items required to be built into masonry by other trades.

.2 Prevent displacement of built-in items during construction. Check for plumbness, alignment, and correctness of position, as work progresses.

.3 Brace door jambs to maintain plumbness. Fill door frame with concrete.

3.10 WETTING OF UNITS

.1 Except during winter, wet units having an initial rate of absorption exceeding 1g/min/100mm2; wet to uniform degree of saturation, to 24 hours before laying, and do not lay until surface is dry.

.2 Similarly, wet tops of walls built of units qualifying for wetting, when recommencing work on such walls.

3.11 SUPPORT OF LOADS

.1 Except where drawing requirements are more stringent, comply with Clause 6.3 of CSA S304.1.

.2 Where concrete fill is used in lieu of solid units, use minimum 25 MPa concrete to Section 03 30 00.

.3 Install building paper below voids to be filled with concrete; keep paper 25 mm back from faces of units.

3.12 PROVISION FOR MOVEMENT

.1 Leave 5 mm space below shelf angles.

.2 Leave 6 mm space and do not use wedges between tops of non-load bearing walls and partitions and structural elements.

3.13 LINTELS

.1 Install steel lintels above windows, doors and all mechanical and electrical as shown on structural drawings. Centre over opening width.

.2 Install loose steel lintels supplied by Section 05 12 23. Centre lintel over opening width. Minimum 150 mm solid bearing each end.

.3 Lintels over 2000 mm span to be complete with bearing plate and anchors each end.

.4 Bridge openings less than 450 mm wide with 6 mm thick mild steel plate lintels, bearing minimum 100 mm on each side of opening and set on dry pack grout. Width of plate to be equal to the wall thickness less 25 mm.

.5 Install precast concrete lintels supplied under Section 03 30 00.

□

3.14 CONTROL AND EXPANSION JOINTS

.1 Except as noted following, control joints required at maximum of 6000 mm o.c. in continuous walls having no openings, intersections or column locations. Refer to elevations for locations on exterior walls and advise Consultant of variances prior to executing the work. Control joints are not shown for clarity on the drawings for interior walls. If in doubt, request assistance from the Consultant.

.2 At doorway locations, unless indicated otherwise on elevation drawings, use one side of doorway beyond lintel. Use building paper to prevent that end of lintel to bond.

.3 Use standard block with concrete filled end core to form key. Line one side of core with building paper before filling core to prevent bonding. Complete vertical separation, full height and thickness of wall are required.

.4 Stop masonry reinforcing at each side of the joints. Caulking specified in Section 07 92 10 – Joint Sealers.

.5 At expansion joints in brick and veneer, install Rapid Expansion joint DA 2015, to leave vertical joint free of mortar to allow for horizontal expansion.

3.15 INSPECTION & TESTING

.1 Refer to Section 01 11 00 – Summary of Work, section 1.29.

3.16 CLEANING

.1 Perform cleaning as soon as possible after installation to remove construction and accumulated environmental dirt.

.2 On a weekly basis and at completion of work remove all debris, cut blocks and bricks, and mortar droppings.

.3 Power wash or brush exterior masonry surfaces at completion of work.

.1 Soft, clean cloths.

.4 Clean concrete brick masonry as work progresses.

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

.5 Upon completion of installation, remove surplus materials, rubbish, tools and equipment barriers.

END OF SECTION

□

PART 1 – GENERAL

1.1 General Requirements

.1 Make a thorough examination of the drawings, the specifications and the site, to determine the intent, extent, materials, and conditions of interfacing with other work and to be fully cognizant of requirements.

.2 This specification section is to provide the minimum requirements applicable to Structural Load Bearing Concrete Masonry Units (CMU).

.3 Included in this section are clauses for the following items as applicable to Structural Load Bearing CMU:

- .1 Masonry Load Bearing Units
- .2 Multi-Wythe Unit Masonry
- .3 Cavity Wall Unit Masonry
- .4 Engineered Unit Masonry (Reinforced Unit Masonry)
- .5 Connectors & Reinforcing applicable to Load Bearing CMU
- .6 Grout applicable to Load Bearing CMU
- .7 Mortar applicable to Load Bearing CMU
- .8 Lintels applicable to Load Bearing CMU

.4 Refer to Architectural Drawings and related specification sections for details of:

- .1 Architectural CMU
- .2 Veneer Masonry
- .3 Flashings
- .4 Insulation
- .5 Air/Vapour Barriers
- .6 Cavity Drainage, Weep Holes, Vents
- .7 Movement (Control) Joints & Expansion Joints
- .8 Non-Load Bearing CMU (Partitions)

1.2 Reference Standards

.1 Comply with The Building Code Act, as amended, the 2024 Ontario Building Code (OBC) as amended and Regulations and by-laws of other authorities having jurisdiction, including latest amendments thereto; all hereafter referred to as Building Code.

.2 All codes, standard specifications and by-laws referred to in this Specification shall be current editions including all latest revisions, addenda and supplements, unless otherwise noted in the Building Code.

.3 Conform to the following CSA Standards:

- .1 A82 ..... Fired Masonry Brick Made from Clay or Shale.

.2 A165.1 ..... Concrete Block Masonry Units.

.3 A165.2 ..... Concrete Brick Masonry Units.

.4 A165.3 ..... Prefaced Concrete Masonry Units.

.5 A179 ..... Mortar and Grout for Unit Masonry.

.6 A370 ..... Connectors for Masonry.

.7 A371 ..... Masonry Construction for Buildings.

.8 G30.18 ..... Carbon Steel Bars for Concrete Reinforcement.

.9 S304.1 ..... Design of Masonry Structures.

.4 Conform to the following ASTM Standards:

.1 A153/A153M ..... Zinc Coating (Hot-Dip) on Iron and Steel Hardware.

.2 E488/E488M ..... Standard Test Methods for Strength of Anchors in Concrete Elements.

.5 Refer also to the notes and details on the Structural Drawings.

.6 Conform to the Occupational Health and Safety Act, R.S.O. 1990, c. O.1, last amendment 2014, c. 10, Sched. 4.

1.3 Source Quality Assurance

.1 Refer also to **Quality Control** later in this section.

.2 The masonry contractor shall be a member in good standing with the Canadian Masonry Contractors' Association (CMCA) and/or the Ontario Masonry Contractors' Association (OMCA).

.3 Concrete Masonry Units shall be manufactured to Canadian Concrete Masonry Producers' Association (CCMPA) and CSA A165.1, A165.2, and A165.3 requirements.

.4 When requested provide documentation confirming compliance with the specified standards.

PART 2 – PRODUCTS

2.1 Materials

.1 CONCRETE MASONRY UNITS (CMU)

.1 Unless otherwise noted all CMU shall be CCMPA Metric Modular Sizes and shapes.

.2 CMU shall be manufactured to CCMPA and CSA A165.1, A165.2, and A165.3 requirements complying with the "FACET" properties defined in CCMPA specifications as follows:

.1 For below grade and exterior exposed walls use Normal Weight Load Bearing units:

Standard Hollow ..... TYPE H/15/A/M
75% Solid ..... TYPE S/15/A/M
100% Solid ..... TYPE S/15/A/M

.2 For Interior, above grade walls, use either Lightweight Load Bearing units:

Standard Hollow ..... TYPE H/15/C/M
75% Solid ..... TYPE S/15/C/M
100% Solid ..... TYPE S/15/C/M

OR

Ultra-Light (or equivalent) Load bearing Units:

Standard Hollow ..... TYPE H/15/D/M
75% Solid ..... TYPE S/15/D/M
100% Solid ..... TYPE S/15/D/M

.3 Refer to Architectural Drawings, Schedules and elsewhere in the specification for locations and types.

.2 CLAY BRICKS

.1 Where bricks are incorporated into load bearing walls, refer to drawings, bricks shall conform to CSA A82 and unless otherwise noted shall have a minimum compressive strength (Brick Flatwise), Gross Area, of 20 MPa [2.9 ksi].

.3 MORTAR & GROUT

.1 Materials used as ingredients in mortar and grout shall comply with CSA A179.

.2 Mixing, whether on site or Ready-Mixed in a batching plant shall comply with CSA A179.

.3 Mortar for laying all Load Bearing Units shall be TYPE S (unless noted) as defined in CSA A179.

.4 Grout shall be as noted in the Concrete Mix Schedule on the drawings and unless noted shall be a minimum compressive strength at 28 days of 15 MPa [2.18 ksi] (Fine Grout) conforming to CSA A179.

.5 **NOTE: SUBSTITUTION OF MORTAR FOR GROUT IS NOT PERMITTED**

.4 MASONRY CONNECTORS & JOINT REINFORCEMENT shall comply with CSA A370, this includes but not limited to:

Anchors, Fasteners, Ties, Strip ties, Dovetail anchors, Bar anchors, Rod anchors, Strap Anchors, Wall and Partition Anchors, Horizontal Joint Reinforcement.

Acceptable Types as manufactured by:

Blok-Lok
Fero Corp.
Hohmann & Bernard

.5 JOINT REINFORCEMENT

.1 Joint Reinforcement as a minimum shall be continuous “Ladder” type, prefabricated with 3.66 mm [1/8″] diameter longitudinal and cross wires. Provide “Truss Type” reinforcement where shown on drawings.

.2 For all walls in a moist environment, joint reinforcement shall be Hot-Dipped Galvanized to ASTM A153/A153M with a minimum coating of 458 g/m² [1.50 oz/ft²].

.3 Provide all pre-fabricated Corner & Tee Sections.

.4 Composite and cavity walls: where coursing of wythes do not align or where it is desirable and permitted to build one wythe before the other, reinforcing shall be an approved adjustable type with a box or eye section which extends into the collar joint or cavity and restrains the transverse movement of the two wythes.

.5 For cavity walls with rigid insulation, extension shall be designed to hold the insulation in place by use of plastic wedges or approved equal.

.6 Galvanized hook style ‘box ties’ or ‘pin-ties’ shall extend into the face wythe to complete the assembly.

.6 VERTICAL REINFORCING including ties/stirrups.

.1 Shall be fabricated from material conforming to CSA G30.18 with a minimum yield stress of 400 MPa [58 ksi].

.2 All bars to have typical identification patterns and standard identification requirements.

PART 3 – EXECUTION

3.1 Product Delivery

.1 Deliver all materials to job site in dry conditions.

.2 Keep all materials dry until use.

.3 Store under waterproof covers on pallets or plank platforms held off the ground.

.4 Protect CMU from damage.

.5 **Do not** use chipped, cracked or otherwise damaged units in Load Bearing Walls.

3.2 Lay out coursing and bond to achieve correct coursing heights and continuity of bond with a minimum of cutting. **TOLERANCES** shall conform to CSA A371.

3.3 Running Bond

Unless otherwise noted, all load bearing walls shall be laid in “Running Bond” as defined in the CCMPA Metric Technical Manual.

3.4 Mortar Joints

.1 Mortar joint thicknesses shall conform to CSA A179.

.2 Unless otherwise noted at all exposed faces, exposed mortar joints shall be compressed and uniformly concave.

.3 At non-exposed surfaces concealed mortar joints shall be “struck” flush.

.4 In Composite Walls the vertical collar joints between wythes shall be completely filled with mortar or grout.

3.5 Horizontal Joint Reinforcement

.1 The following are minimum requirements (refer also to details, notes and schedules on the drawings):

.1 Spacing: provide reinforcing in the top course immediately below floor & roof bearing levels and the first two courses above and below every wall opening. The reinforcing shall extend 600 mm [24″] beyond such openings. For the remainder of walls, the vertical spacing shall not exceed 400 mm [16″].

.2 Overlap splices: shall be a minimum of 150 mm [6″] for knurled wire and 300 mm [1/2″] for plain wire. Laps shall be staggered a minimum of 750 mm [30″] from course to course. Reinforcing shall not pass through a vertical control movement joint unless otherwise show.

3.6 Connectors

.1 Installed and spaced in accordance with CSA A371 and as shown on the drawings and typical details.

3.7 Vertical Reinforcement

.1 Sized and spaced as shown on the drawings, schedules and typical details.

.2 Vertical bars shall have a minimum clearance of 12 mm [1/2″] from the masonry and have not less than one bar diameter between bars.

.3 All block cores containing vertical reinforcement shall be solidly filled with grout.

3.8 Grout

.1 Conform to CSA A179.

.2 Provide grout with minimum compressive strength and slump as noted on drawings and schedule.

.3 Provide clean-out openings at the bottom of all cores containing vertical reinforcement at each lift or pour.

3.9 Expansion and Control (Movement) Joints

.1 Shall be provided. See Architectural Drawings and/or specifications for details and locations

3.10 Bond Beams

.1 Make from Lintel blocks or half web blocks as shown on the drawings, shall conform to CSA A179.

.2 Provide reinforcing as shown, with minimum splice lengths of 300 mm [12″], hooked at corners and fill with specified concrete or grout.
Note: Mortar is NOT acceptable

3.11 Lintels

.1 CONCRETE MASONRY LINTELS

Where approved for use provide reinforced concrete block lintels over openings. End Bearings, normally 200 mm (minimum 150 mm). Provide reinforcement and grout fill as specified on TYPICAL DETAILS & schedules.
Note: Mortar is NOT acceptable

.2 LOOSE STEEL LINTELS

Install steel lintels provided by others in accordance with drawings, schedules and typical details.

.3 Provide movement joints and sliding bearings as detailed on drawings.

3.12 Cut-Outs

.1 Cut-out neatly for electrical switches, outlet boxes and any other recessed or built-in objects.

.2 Make cuts straight, clean and free from uneven edges.

3.13 Built-In Items

.1 Build-in items required to be built into masonry.

.2 Brace door jambs to maintain plumb. Fill spaces between jambs and masonry with mortar.

.3 Install wall plates (Bearing Plates) WP for beams, joists, lintels, and indicated items as provided by others. WP to be at levels and positions as required. WP to be accurately located and levelled. Grout in anchors solidly into bearings.

3.14 Bearings on Masonry

.1 Minimum bearing on masonry unless otherwise noted:

Beams (steel, conc., wood)	200 mm [8″] nominal
Lintels (steel, conc., wood)	150 mm [6″] nominal
Joists (steel, wood)	100 mm [4″] nominal
Slabs (cast-in-place, precast)	100 mm [4″] nominal
Steel decking (on weld plate)	100 mm [4″] nominal

.2 Masonry bearings shall be of solid blocks (or grouted solid) or bricks laid in mortar.

.3 All joints are to be fully filled with type “S” mortar.

.4 Minimum size of solid bearings at beams and lintels, unless noted, shall be equal to twice the bearing/wall plate (WP) length and for a depth equal to the bearing/wall plate (WP) length, and in no case shall be less than 400 mm long x 200 mm deep [16″ x 8″], positioned symmetrical under the bearing point.

.5 Provide a minimum of one continuous course 200 mm [8″] of solid or grouted void blocks or bricks laid in mortar at the top course immediately below all floor and roof bearing levels.

.6 Provide vertical grouted reinforcing under bearings as shown or noted.

3.15 Bracings

.1 Bracings as shown on the structural drawings are for the finished (permanent) conditions.

.2 TEMPORARY BRACING
The General Contractor shall be responsible for temporary bracing design, supply, installation and maintenance. All such bracings shall be as required by the governing standards and authorities.

3.16 Cold Weather Requirements

.1 Requirements, protection, heat and heat enclosures shall conform to CSA A371. Under no circumstances shall masonry construction be permitted when the air temperature falls below -12°C [54°C].

3.17 Hot Weather Requirements

.1 Protect freshly laid masonry from drying too rapidly, by means of waterproof, non-staining coverings.

3.18 Protection

.1 Keep masonry dry using waterproof, non-staining coverings that extend over walls and down sides sufficient to protect walls from wind-driven rain until masonry work is completed and protected by flashings or other permanent construction.

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

3.19 Periodic Field Review

.1 The Contractor shall notify the Structural Consultant periodically prior to closing in of the work in order for the Consultant to review for general compliance with the structural documents.

.2 The Contractor shall provide necessary cooperation to ensure that the inspection can proceed.

.3 The inspection provided in this section does not relieve the Contractor of the responsibility for performance of the contract. The Contractor is solely responsible for quality control and shall implement appropriate supervising and quality control procedures.

3.20 Clean-Up

.1 Upon satisfactory completion of the work, clear away from the building and premises all tools, utensils, apparatus, excess or waste materials and debris resulting from the operations, and leave all complete and in a condition acceptable to the Architect

3.21 Quality Control

.1 Implement a system of quality control to ensure that the minimum standards specified herein are attained.

.2 Bring to the attention of the Consultant any defects in the work or departures from the Contract Documents which may occur during construction. The Consultant will decide upon corrective action and give recommendations in writing.

.3 The Consultant 's general review during construction and inspection and testing by Independent Inspection and Testing Companies reporting to the Consultant are both undertaken to inform the Consultants of the Contractor's performance and shall in no way augment the Contractor's quality control or relieve the Contractor of contractual responsibility.

.4 Conform to the requirements of CSA A165.1, A165.2, A165.3, A179, A370 and A371.

.5 Provide a competent and experienced supervisor or foreman who shall be present on the site continuously throughout each working day.

.6 Refer also to **Source Quality Assurance** earlier in this section.

3.22 Notification

.1 Prior to commencing significant segments of the work, give the Consultant and Independent Inspection and Testing Companies appropriate notification so as to afford them reasonable opportunity to review the work. Failure to meet this requirement may be cause for the Consultant to classify the work as defective.

3.23 Inspection And Testing

.1 The General Contractor in agreement with the Halton Catholic District School Board and Prime Consultant will appoint an Independent Inspection and Testing Companies to make inspections or perform tests as the Consultant directs. The Independent Inspection and Testing Companies shall be responsible only to the Consultant, and shall make only such inspections or tests as the Consultant may direct. The representative of the Inspection and Testing Company shall NOT be required to supervise or instruct the Contractor.

.2 The Inspection and Testing Company will conduct inspection and testing services per the following:

.1 Specification Section 01 45 23 – *Testing and Inspection Services – General Requirements.*

3.24 Defective Materials And Work

.1 Where evidence exists that defective work has occurred or that work has been carried out incorporating defective materials, the Consultant may have tests, inspections or surveys performed, analytical calculations of structural strength, made and the like, in order to help determine whether the work must be corrected or replaced. Tests, inspections or surveys or calculations carried out under these circumstances will be made at the Contractor's expense, regardless of their results, which may be such that, in the Consultant's opinion, the work may be acceptable.

.2 All testing shall be conducted in accordance with the requirements of The Building Code, except where this would, in the Consultant's opinion, cause undue delay or give results not representative of the rejected material in place. In this case, the tests shall be conducted in accordance with the standards given by the Consultant.

.3 Materials or work which fail to meet specified requirements may be rejected by the Consultant whenever found at any time prior to final acceptance of the work regardless of previous inspection. If rejected, defective materials or work shall be promptly removed and replaced or repaired to the satisfaction of the Consultant, at no expense to the Owner.

END OF SECTION 04 22 01

PART 1 - GENERAL

1.1 General Requirements

.1 When members are specifically designated as "Architecturally Exposed Structural Steel" or "AESS" in the Contract Documents, the requirements in this section shall apply in addition to Section 05 21 19.

.2 AESS members or components shall be fabricated and erected with the care and dimensional tolerances that are stipulated in this section.

.3 Refer to Architectural Drawings for "Key Plan" showing locations and Categories of AESS finishes. All AESS members must also be identified by their Category on the Architectural Design Documents.

1.2 Definition Categories

.1 Categories are listed in the AESS Matrix shown in Table 1 where each Category is represented by a set of Characteristics. Refer to the CISC Code of Standard Practice Appendix I for additional information. The following Categories shall be used when referring to AESS:

AESS 1: **Basic Elements**
Suitable for "basic" elements which require enhanced workmanship.

AESS 2: **Feature Elements viewed at a Distance > 6 m**
Suitable for "feature" elements viewed at a distance greater than six meters. The process involves basically good fabrication practices with enhanced treatment of weld, connection and fabrication detail, tolerances for gaps, copes.

AESS 3: **Feature Elements viewed at a Distance ≤ 6 m**
Suitable for "feature" elements – where the designer is comfortable allowing the viewer to see the art of metalworking – welds are generally smooth but visible, some grind marks are acceptable. Tolerances are tighter than normal standards. The structure is normally viewed closer than six meters and is frequently subject to touch by the public.

AESS 4: **Showcase Elements**
Suitable for "showcase or dominant" elements – used where the designer is comfortable allowing the viewer to see the art of metalworking – welds are generally smooth but visible, some grind marks are acceptable. Tolerances are tighter than normal standards. The structure is normally viewed closer than six meters and is frequently subject to touch by the public.

AESS C: **Custom Elements**
Suitable for elements that require a different set of characteristics as specified in Categories AESS 1, 2, 3 or 4.

1.3 Related Documents

.1 Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 “Specifications” Section, apply to this section.

.2 Related Sections: The following section contain requirements that may relate to this section:

.1 Division 1 “Quality Control” Section for independent testing agency procedures and administrative requirements.

.2 Division 5 “Steel Joist” Section.

.3 Division 5 “Metal Decking” Section for erection requirements relating to exposed steel decking and its connections.

.4 Division 9 “Painting” Section for finish coat requirements and coordination with primer and surface preparation specified in this section.

1.4 Reference Standards

.1 Comply with The Building Code Act, as amended, the 2024 Ontario Building Code (OBC) as amended and Regulations and by-laws of other authorities having jurisdiction, including latest amendments thereto; all hereafter referred to as Building Code.

.2 All codes, standard specifications and by-laws referred to in this Specification shall be current editions including all latest revisions, addenda and supplements, unless otherwise noted in the Building Code

.3 Refer to and comply with all standards referred to in Section 05 21 19 of this specification, and in addition conform to the following:

.1 ASTM A6/A6M..... Standard Specification for General Requirements for Rolled Structural Steel Bars, Plates, Shapes, and Sheet Piling.

.2 ASTM A780/A780M..... Standard Practice for Repair of Damaged and Uncoated areas of Hot-Dip Galvanized Coatings.

1.5 Submittals

.1 Submit each item below according to the Conditions of the Contract and Division 1 “Specifications” Section.

.2 Shop Drawings detailing fabrication of AESS components:

.1 Provide erection drawings clearly indicating which members are considered as AESS members and identify by the Categories listed in Table 1.

.2 Include details that clearly identify all of the requirements listed in Sections 2.3 "Fabrication" and 3.3 "Erection" of this specification. Provide connections for AESS consistent with concepts, if shown on the Structural Design Documents.

.3 Indicate welds by standard CWB symbols, distinguishing between shop and field welds, and show size, length and type of each weld. Identify grinding, finish and profile of welds as defined herein.

.4 Indicate type, finish of bolts. Indicate which side of the connection bolt heads should be placed.

.5 Indicate any special tolerances and erection requirements;

.6 For Category AESS C, the AESS Matrix included in Table 1 shall be used to specify the required treatment of the element.

.7 Any variations from the AESS Categories listed must be clearly noted. These variations could include machined surfaces, locally abraded surfaces, and forgings. In addition:

.1 If distinction is to be made between different surfaces or parts of members the transition line/plane must be clearly identified/defined on the Shop detail, arrangement and erection drawings.

.2 Track welds, temporary braces, fixtures used in fabrication are to be indicated on shop drawings.

.3 All architecturally sensitive connection details will be submitted for approval by the Architect/Engineer prior to completion of shop detail drawings.

1.6 Quality Assurance

.1 FABRICATOR QUALIFICATIONS: In addition to those qualifications listed in other sections of Division 5 "Structural Steel and Open Web Steel Joist Framing" Section 05 21 19, engage a firm with a minimum 5 years of experience in fabricating AESS similar to that indicated for this Project and with sufficient production capacity to fabricate the AESS elements.

.2 ERECTOR QUALIFICATIONS: In addition to those qualifications listed in other sections of Division 5 "Structural Steel and Open Web Steel Joist Framing" Section 05 21 19, engage a competent Erector who has a minimum 5 years of experience carrying out comparable AESS work.

.3 Comply with applicable provisions of the following specifications and documents:

.1 CISC Code of Standard Practice, latest edition.

.4 Visual samples when specified may include any of the following:

.1 3-D rendering of specified element.

.2 Physical sample of surface preparation and welds.

.3 First off inspection: First element fabricated for use in finished structure subject to alterations for subsequent pieces.

.4 Mockups: As specified in Structural Design Document. Mockups are either scaled or full scale. Mockups are to demonstrate aesthetic effects as well as qualities of materials and execution:

.1 Mockups may have finished surface (including surface preparation and paint system).

.2 Architect's approval of mockups is required before starting fabrication of final units.

.3 Mockups are retained until project is completed.

.4 Approved full-scale mockups may become part of the completed work.

1.7 Delivery, Storage and Handling

.1 Ensure that all items are properly prepared, handled and/or package for storage and shipping to prevent damage to product.

.2 Erect finished pieces using softened slings or other methods such that they are not damaged. Provide padding as required to protect while rigging and aligning member's frames. Weld tabs for temporary bracing and safety cabling only at points concealed from view in the completed structure or where approved by the Architect.

PART 2 - PRODUCTS

2.1 Materials

.1 General: Meet requirements of sections of Division 5 "Structural Steel and Open Web Steel Joist Framing" Section 05 21 19.

.2 Specialty bolts must be specified.

2.2 Special Surface Preparation

.1 Primers: Primers must be specified.

2.3 Fabrication

.1 GENERAL FABRICATION

.1 For the special fabrication characteristics, see Table 1 – AESS Category Matrix.

.2 Fabricate and assemble AESS in the shop to the greatest extent possible. Locate field joints in AESS assemblies at concealed locations or as approved by the Architect.

.3 Fabricate AESS with surface quality consistent with the AESS Category and visual samples if applicable.

.4 The fabricator is to take special care in handling the steel to avoid marking or distorting the members, as follows:

.1 All slings will be nylon type or chains with softeners or wire rope with softeners.

.2 Care is also taken to minimized damage to any shop paint or coating.

.3 If temporary braces or fixtures are required during fabrication, during shipment, or to facilitate erection, care must be taken to avoid and/or repair any blemishes or unsightly surfaces resulting from the use or removal of such temporary elements.

.4 Tack welds are ground smooth.

.2 UNFINISHED, REUSED OR WEATHERING STEEL: Members fabricated of unfinished, reused or weathering steel that are to be AESS may still have erection marks, painted marks or other marks on surfaces in the completed structure. Special requirements shall be specified as Category AESS C.

.3 TOLERANCES FOR ROLLED SHAPES: The permissible tolerances for depth, width, and out of square, camber and sweep of rolled shapes shall be as specified in CSA G40.20/21 and ASTM A6. The following exceptions apply:

.1 For Categories AESS 3 and 4 and otherwise specified in the Contract Documents: The matching of abutting cross-sections shall be required.

.2 For Categories AESS 2, 3 and 4: The as-fabricated straightness tolerance of a member is one-half of the standard camber and sweep tolerance in CSA G40.20/21.

.4 TOLERANCES FOR BUILT-UP MEMBERS: The tolerance on overall profile dimensions of members made up from a series of plates, bars and shapes by welding is limited to the accumulation of permissible tolerances of the component parts as provided by CSA W59 and ASTM A6. For Categories AESS 2 and 3, use camber and sweep tolerances in CSA W59.

.5 JOINTS: For Categories AESS 3 and 4, all copes, miters and butt cuts in surfaces exposed to view are made with uniform gaps, if shown to be open joint, or in uniform contact if shown without gap.

.6 SURFACE APPEARANCE: For Categories AESS 1, 2 and 3, the quality surface as delivered by the mills should be acceptable. For Category AESS 4, the steel surface imperfections should be filled and sanded.

2.4 Shop Connections

.1 BOLTED CONNECTIONS: Make in accordance with Section 05 21 19. Provide bolt type and finish as specified and place bolt heads as indicated on the approved shop drawings.

.2 WELDED CONNECTIONS:

.1 Comply with CSA W59 and Section 05 21 19. Appearance and quality of welds shall be consistent with the Category and visual samples if applicable. Assemblies and weld built-up sections by methods that will maintain alignment of members to the tolerance of this section.

.2 For corrosive environments, all joints should be seal welded. In addition:

.1 For Categories AESS 1, 2 and 3, a smooth uniform weld will be acceptable. For AESS Category, the weld will be contoured and blended.

.2 For Categories AESS 1, 2, 3 and 4, all weld spatter is to be avoided/removed where exposed to view.

.3 For Categories AESS 1 and 2, weld projection up to 2 mm is acceptable for butt and plug welded joints. For Categories AESS 3 and 4, welds will be ground smooth/filled.

.3 WELD SHOW-THROUGH: It is recognized that the degree of weld show-through, which is any visual indication of the presence of a weld or welds on the opposite surface from the viewer, is a function of weld size and material thickness.

PART 3 – EXECUTION

3.1 Examination

.1 The erector shall check all AESS members upon delivery for twist, kinks, gouges or other imperfections, which might result in rejection of the appearance of the member. Coordinate remedial action with fabricator prior to erecting steel.

.2 STANDARD OF ACCEPTANCE: The standard for acceptance of delivered and erected member shall be equivalent to the standard employed at fabrication.

3.2 Preparation

.1 Provide connections for temporary shoring, bracing and supports only where noted on the approved shop erection drawings. Temporary connections shown shall be made at locations not exposed to view in the final structure or as approved by the Architect. Handle, lift and align pieces using padded slings and/or other protection required to maintain the appearance of the AESS through the process of erection.

3.3 Erection

.1 Set AESS accurately in locations and to elevations indicated, and according to CSA S16.

.2 The Erector must plan and execute all operations in such a manner that allows the architectural appearance of the structure to be maintained.

.3 In addition to the special care used to handle and erect AESS, employ the proper erection techniques to meet the requirements of the specified AESS Category:

.1 AESS Erection tolerances: Erection tolerances shall meet the requirements of standard frame tolerance for structural steel per CSA S16.

.2 All slings will be nylon strap or chains with softeners.

.3 If temporary braces or fixtures are required to facilitate erection, care must be taken to avoid and/or repair any blemishes or unsightly surfaces resulting from the use removal of such temporary elements.

.4 Removal of field connection aids: Run-out tabs, erection bolts and other steel members added to connections to allow for alignment, fit-up and welding in the field shall be removed from the structure. Welds at run-out tabs shall be removed to match adjacent surfaces and ground smooth. Holes for erection bolts shall be plug welded and ground smooth where specified. All backing bars will be removed and ground smooth.

.5 Filling of connection access holes: Filling shall be executed with proper procedures to match architectural profile, where specified.

.6 Bolt Head Replacement: All bolt heads shall be placed as indicated on the structural design document. Where not noted, the bolt heads in a given connection shall be on the same side, as specified, and consistent from one connection to another.

.7 Field Welding: Weld profile, quality, and finish shall be consistent with Category and visual samples, if applicable, approved prior to fabrication.

.8 Tack welds shall be ground smooth and holes shall be filled with weld metal or body filler and smoothed by grinding or filling to the standards applicable to the shop fabrication of the materials.

3.4 Erection Tolerances

.1 Unless otherwise specified in the Contract Documents, members and components are plumbed, leveled and aligned to a tolerance equal to the tolerance permitted for structural steel.

3.5 Field Connections

.1 BOLTED CONNECTIONS: Make in accordance with Section 05 21 19. Provide bolt type and finish as specified and place bolt heads as indicated on the approved shop drawings.

.2 WELDED CONNECTIONS:

.1 Comply with CSA W59 and Section 05 21 19. Appearance and quality of welds shall be consistent with the Category and visual samples if applicable. Assemble and weld built-up sections by methods that will maintain alignment of members to the tolerance of this section.

.2 Assemble and weld built-up sections by methods that will maintain alignment of axes. Verify that weld sizes, fabrication sequence, and equipment used for AESS will limit distortions to allowable tolerances.

3.6 Adjustable Connections

.1 Specifically designated more stringent erection tolerances for AESS require that the Owner's plans specify/allow adjustable connections between AESS adjoining structural elements, in order to provide the Erector with means for adjustment and/or specify the method to be used to achieve the desired dimensions. Any proposed adjustment details desired by the Erector shall be submitted to the Architect and Engineer for review.

3.7 Architectural Review

.1 The Architect shall review the AESS steel in place and determine acceptability based on the Category and visual samples (if applicable). The Fabricator/Erector will advise the consultant of the schedule of the AESS Work.

3.8 Protection

.1 In addition to requirements of Division 5 "Structural Steel and Open Web Steel Joist Framing" Section 05 21 19, protect AESS steel in accordance with table below.

Environment	Structural Member	Preparation	Protection	Remarks
Protected (Inside vapour barrier)	Structural Steel and Joists	SSPC-SP6 Commercial Blast Cleaning	CISC/CPMA 2-75	
Unprotected (outside vapour barrier) but **not** exposed to chlorides.	Structural Steel and joists	SSPC-SP6 Commercial Blast Cleaning	Inorganic zinc-rich primer (SSPC Paint 20, type I) and epoxy paint (SSPC Paint 22)	Provide topcoat SSPC Paint 36, Level 3, when exposed to sunlight
Unprotected (outside vapour barrier) exposed to chlorides.	Structural Steel and Joists	SSPC-SP10 Near White Blast Cleaning	Inorganic zinc-rich primer (SSPC Paint 20, type I) and epoxy paint (SSPC Paint 22)	Provide topcoat SSPC Paint 36, Level 3, when exposed to sunlight
High Humidity (inside vapour barrier)	Structural Steel and Joists	SSPC-SP6 Commercial Blast Cleaning	Inorganic zinc-rich primer (SSPC Paint 20, type I) and epoxy paint (SSPC Paint 22)	
Chemical exposures (acidic, alkaline, oxidizing, solvents, etc.)	Structural Steel and Joists	SSPC-SP10 Near White Blast Cleaning	Inorganic zinc-rich primer (SSPC Paint 20, Type I) with chemically resistant finish coat system (SSPC Paint 22) specially chosen to protect primer and base metal against specific chemical agent. (See Note (a))	

Notes:

(a) Submit proposed coating system for approval of consultant prior to application.

3.9 Adjusting and Cleaning

.1 Touchup Painting: Cleaning and touchup painting of field welds, bolted connections, and abraded areas of shop paint shall be completed to blend with the adjacent surfaces of AESS. Such touch up work shall be done in accordance with manufacturer's instructions.

.2 Galvanized Surfaces: Clean field welds, bolted connections, and abraded areas and repair galvanizing to comply with ASTM A780.

3.10 Quality Control

.1 Implement a system of quality control to ensure that the minimum standards specified herein are attained.

.2 Bring to the attention of the Consultant any defects in the work or departures from the Contract Documents which may occur during construction. The Consultant will decide upon corrective action and give recommendations in writing.

.3 The Consultant 's general review during construction and inspection and testing by Independent Inspection and Testing Companies reporting to the Consultant are both undertaken to inform the Owner of the Contractor's performance and shall in no way augment the Contractor's quality control or relieve the Contractor of contractual responsibility. The contractor is solely responsible for quality control and shall implement its own supervisory and quality control procedures.

3.11 Notification

.1 Prior to commencing significant segments of the work, give the Consultant and Independent Inspection and Testing Companies appropriate notification so as to afford them reasonable opportunity to review the work. Failure to meet this requirement may be cause for the Consultant to classify the work as defective.

3.12 Inspection and Testing

.1 TheGeneral Contractor in agreement with the Halton Catholic District School Board and Prime Consultant will appoint an Independent Inspection and Testing Companies to make inspections or perform tests as the Consultant directs. The Independent Inspection and Testing Companies shall be responsible only to the Consultant, and shall make only such inspections or tests as the Consultant may direct. The representative of the Inspection and Testing Company shall NOT be required to supervise or instruct the Contractor.

.2 The Inspection and Testing Company will conduct inspection and testing services per the following:

.1 Specification Section 01 45 23 – *Testing and Inspection Services – General Requirements.*

3.13 Defective Materials and Work

.1 Where evidence exists that defective work has occurred or that work has been carried out incorporating defective materials, the Consultant may have tests, inspections or surveys performed, analytical calculations of structural strength, made and the like, in order to help determine whether the work must be corrected or replaced. Tests, inspections or surveys or calculations carried out under these circumstances will be made at the Contractor's expense, regardless of their results, which may be such that, in the Consultant's opinion, the work may be acceptable.

.2 All testing shall be conducted in accordance with the requirements of The Building Code, except where this would, in the Consultant's opinion, cause undue delay or give results not representative of the rejected material in place. In this case, the tests shall be conducted in accordance with the standards given by the Consultant.

.3 Materials or work which fail to meet specified requirements may be rejected by the Consultant whenever found at any time prior to final acceptance of the work regardless of previous inspection. If rejected, defective materials or work shall be promptly removed and replaced or repaired to the satisfaction of the Consultant, at no expense to the Owner.

Table 1 – AESS Category Matrix

See Notes corresponding to Id (Next Page)

	Category	**AESS C**	**AESS 4**	**AESS 3**	**AESS 2**	**AESS 1**	**SSS**
Id	**Characteristics**	Custom Elements	Showcase Elements	Feature Elements (Viewed at a Distance ≤ 6 m)	Feature Elements (Viewed at a Distance > 6 m)	Basic Elements	Standard Structural Steel (CSA S16)
1.1	Surface preparation to SSPC-SP 6		X	X	X	X	
1.2	Sharp edges ground smooth		X	X	X	X	
1.3	Continuous weld appearance		X	X	X	X	
1.4	Standard structural bolts		X	X	X	X	
1.5	Weld spatters removed		X	X	X	X	
2.1	Visual Samples		Optional	Optional	Optional		
2.2	One-half standard fabrication tolerances		X	X	X		
2.3	Fabrication marks not apparent		X	X	X		
2.4	Welds uniform and smooth		X	X	X		
3.1	Mill marks removed		X	X			
3.2	Butt and plug welds ground smooth and filled		X	X			
3.3	HSS weld seam oriented for reduced visibility		X	X			
3.4	Cross sectional abutting surface aligned		X	X			
3.5	Joint gap tolerances minimized		X	X			
3.6	All welded connections		Optional	Optional			
4.1	HSS seam not apparent		X				
4.2	Welds contoured and blended		X				
4.3	Surfaces filled and sanded		X				
4.4	Weld show-through minimized		X				
C.1			X				
C.2			X				
C.3			X				
C.4			X				

Notes to Table 1

1.1 Prior to blast cleaning, any deposits of grease or oil are to be removed by solvent cleaning, SSPC-SP 1.

1.2 Rough surfaces are to be deburred and ground smooth. Sharp edges resulting from flame cutting, grinding and especially shearing are to be softened.

1.3 Intermittent welds are made continuous, either with additional welding, caulking or body filler. For corrosive environments, all joints should be seal welded. Seams of hollow structural sections shall be acceptable as produced.

1.4 All bolt heads in connections shall be on the same side, as specified, and consistent from one connection to another.

1.5 Weld spatter, slivers, surface discontinuities are to be removed. Weld projection up to 2 mm [1/16″] is acceptable for butt and plug welded joints.

2.1 Visual samples are either a 3-D rendering, a physical sample, a first off inspection, a scaled mock-up or a full-scale mock-up, as specified in Contract Documents.

2.2 These tolerances are required to be one-half of those of standard structural steel as specified in CSA S16.

2.3 Members marked with specific numbers during the fabrication and erection processes are not to be visible.

2.4 The welds should be uniform and smooth indicating a higher level of quality control in the welding process.

3.1 All mill marks are not to be visible in the finished product.

3.2 Caulking or body filler is acceptable.

3.3 Seams shall be oriented away from view or as indicated in the Contract Documents.

3.4 The matching of abutting cross-sections shall be required.

3.5 This characteristic is similar to 2.2 above. A clear distance between abutting members of 3 mm [1/8″] is required.

3.6 Hidden bolts may be considered.

4.1 HSS seams shall be treated so they are not apparent.

4.2 In addition to a contoured and blended appearance, welded transitions between members are also required to be contoured and blended.

4.3 The steel surface imperfections should be filled and sanded.

4.4 The back face of the welded element caused by the welding process can be minimized by hand grinding the backside of the weld. The degree of weld-through is a function of weld size and material.

C. Additional characteristics may be added for custom elements.

END OF SECTION 05 12 13

PART 1 – GENERAL

1.1 General Requirements

.1 The Contractor shall ensure that no asbestos containing materials are used in connection with the work of this section.

1.2 Reference Standards

.1 Comply with The Building Code Act, as amended, the 2024 Ontario Building Code (OBC) as amended and Regulations and by-laws of other authorities having jurisdiction, including latest amendments thereto; all hereafter referred to as Building Code.

.2 All codes, standard specifications and by-laws referred to in this Specification shall be current editions including all latest revisions, addenda and supplements, unless otherwise noted in the Building Code.

.3 Conform to the following CSA Standards:

.1	S16	Design of Steel Structures.
.2	W59	Welded Steel Construction (Metal Arc Welding).
.3	W47.1	Certification of Companies for Fusion Welding of Steel.
.4	G40.20/G40.21	General Requirements for Rolled or Welded Structural Quality Steel/Structural Quality Steel.
.5	S136	North American Specification for the Design of Cold-Formed Steel Structural Members.

.4 Conform to the following ASTM Standards:

.1	A108	Standard Specification for Steel Bar, Carbon and Alloy, Cold-Finished.
.2	A123/A123M	Standard Specification for Zinc (Hot-Dip Galvanized) Coatings for Iron and Steel Products.
.3	A563	Standard Specification for Carbon and Alloy Steel Nuts.

.4 F436/436M ..... Standard Specification for Hardened Steel Washers Inch and Metric Dimensions

.5 F1554 ..... Standard Specification for Anchor Bolts, Steel, 36, 44 and 105 ksi Yield Strength.

.6 F3125/F3125M ..... 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.

.5 Conform to:

.1 CISC/CPMA 1-73a ..... A Quick-Drying One-Coat Paint for Use on Structural Steel.

.2 CISC/CPMA 2-75 ..... A Quick-Drying Primer for Use on Structural Steel.

.6 In the event of conflict between reference standards, codes, drawings and specifications, the Contractor shall request clarification by the Consultant. The Consultant's decision as to which requirements govern shall be final and binding. Generally the more stringent provision shall govern. No extras to the contract will be approved due to such clarification.

.7 Conform to the Occupational Health and Safety Act, R.S.O. 1990, c. O.1, last amendment.

1.3 Architectural Exposed Structural Steel (AESS)

.1 Where finished surfaces of steel are designated as AESS on the drawings, refer to Section 05 12 13 "Architecturally Exposed Structural Steel" for additional requirements.

1.4 Source Quality Assurance

.1 The following is MANDATORY;

.1 The bidding Contractors are advised that their bids may be rejected unless documentation is submitted.

.2 Submission does not mean acceptance. Acceptance shall be in writing issued by the Consultant.

.3 The steel fabricator and erector shall have a minimum of five (5) years of experience on projects of similar size and scope. If requested, the fabricator and erector shall provide documentation with references including contact names and phone numbers.

.2 Submit two (2) certified copies of mill reports covering chemical and physical properties of steel used in this work.

1.5 Design of Details and Connections

.1 Design details, new connections and open web steel joists by a Licensed Professional Engineer, to requirements of CSA-S16 or CSA-S136 to resist forces, moments and shears indicated on or implied by the drawings.

.2 Unless otherwise noted, beam connections shall be designed for a minimum of 50% of the shear capacity of the beam.

.3 Conform to the Fire Rated Assembly Design specified for the project.

.4 Bolts in the following types of connections are to be **pretensioned** in accordance with the requirements of S16:

.1 Slip-critical connections.

.2 Connections governed by seismic requirements.

.3 Connections for all elements resisting crane loads.

.4 Connections for members directly supporting running machines or other live loads that produce impact or cyclic load.

.5 Connections where bolts are subject to tensile loads.

.6 Connections using oversized or slotted holes unless specifically designed to accommodate moment.

.5 The following types of connections are to be designed as **slip-critical connections**:

.1 Connections where slippage cannot be tolerated, including:

1. All moment connections (unless end plate type moment connections are used.

2. Connections where welds and bolts share in transmitting shear forces at a common faying surface.

.2 Connections that utilise oversized holes.

.3 Connections subject to fatigue or frequent load reversals.

.6 OPEN WEB STEEL JOISTS

.1 Design steel joists and bridging to carry loads indicated or implied by the drawings in accordance with CSA-S16 or CSA-S136. In addition, design joints for any concentrated loads resulting from piping which runs parallel with the joists. Bottom chords shall be designed for a minimum point load of 2 kN at any location, except for bottom chords of joists directly above mechanical, electrical or equipment areas which shall be designed for a minimum point load of 4 kN at any location.

.2 Design joists and anchorages for uplift forces as indicated.

.3 Ensure joists are manufactured to consider load effects due to fabrication, erection and handling.

.4 Limit roof joist deflection due to specified live load to 1/300 of span.

.5 For joist spans adjacent to rigid supports (e.g. bearing walls, rigid beams or trusses, or intermediate columns), gradually increase the stiffness of the joists in the vicinity of the rigid support such that the differential live load deflection between adjacent joists spaced at a distance "S" is within 1/300 of 2*S, for roof joists.

.6 Joists which will be permanently exposed shall be neat and uniform in appearance to the approval of the Architect.

1.6 Submissions

.1 Refer also to **Source Quality Assurance**.

.2 Refer also to **Quality Control.**

.3 Prior to submission of SHOP DRAWINGS, submit calculations and sketches for review that bear the stamp and signature of the Licensed Professional Engineer responsible for the design. The following are MANDATORY REQUIREMENTS:

.1 TYPICAL MOMENT CONNECTIONS.

.2 VERTICAL BRACINGS.

.3 COLUMN TO BASE PLATE CONNECTIONS.

.4 BEAM TO COLUMN SHEAR CONNECTIONS.

.5 BEAM TO BEAM CONNECTIONS.

.6 COLUMN TO COLUMN "VERTICAL" AND "FUTURE" CONNECTIONS.

.7 NON-STANDARD CONNECTIONS.

.8 OPEN WEB STEEL JOISTS.

.4 Submitted Shop Drawings shall cross reference to reviewed and approved calculations and sketches.

.5 **Shop Drawings**

.1 Provide erection drawings having a scale no less than the structural framing plans and detail drawings of individual members and complete information necessary for fabrication and erection.

.2 Copies of Structural Framing Plans and Sections utilized as erection drawings are not permitted unless permission is first sought from and granted by the Structural Consultant.

.3 Submit shop drawings for review as directed.

.4 All shop drawings shall bear a Professional Seal and Signature.

.5 OPEN WEB STEEL JOISTS:

.1 Provide layout drawings showing location of open web steel joists, and design calculations for joists, covering each case of joist total loading.

.2 Drawings and calculations must be prepared using **METRIC** units. If both imperial and metric units are shown, only metric units will be reviewed in context of the rubber stamp placed on each drawing.

.3 All steel joists shall be designed by a Professional Engineer experienced in this type of design and all drawings and calculations shall bear a Professional Seal and Signature.

.4 OWSJ shop drawings and calculations submitted for review and **NOT BEARING** the stamp of the Professional Engineer responsible for the OWSJ design, and **NOT ACCOMPANIED** by stamped calculations, will **NOT BE REVIEWED** and will be returned to the Contractor.

.6 Fabrication shall not commence until shop drawings are reviewed.

.7 Allow ten (10) working days for the review of drawings and supply as many copies for review and distribution as directed. Shop drawings shall be checked in detail by the Contractor and shall bear the checker's initials before submission.

.8 Drawings which fail to meet these requirements shall be returned marked **NOT REVIEWED** and must be re-submitted after correction.

.9 The review of shop drawings shall not relieve the Contractor of the responsibility of seeing that this work is complete, accurate and in conformity with the drawings and this specification.

.10 Only shop drawings bearing the review stamps shall be kept at the site.

PART 2 – PRODUCTS

2.1 Materials

.1 MATERIALS

.1 Structural steel sections and plates and all connection angles and plates shall conform to CSA Standard G40.20/G40.21 as follows:

W shapes – Grade 350W.
S shapes – Grade 300W.
HSS Shapes – Grade 350W (Class C unless noted).
Channels, Angles – Grade 350W.
Plates and Rod – Grade 300W.

Note that ASTM A500 grade C HSS columns are NOT an acceptable direct substitution for CSA G40.21.

.2 Welding materials: to conform to CSA Standard W59.

.3 High Strength Fasteners: Bolts, Nuts, and Washers to conform to ASTM F3125/3125M, grade A325.

.4 Anchor Rods: to conform to to ASTM F1554, Grade 36, unless otherwise noted on the drawings

.5 Sag Rods: to conform to CSA G40.20/G40.21.

.6 Strap Anchors: to conform to CSA G40.20/G40.21.

.7 Shear Stud Connectors: to conform to ASTM A108, F_y = 345 MPa [50 ksi].

.8 PAINT:

.1 General Steel: Shop Primer and Field “touch-up” Paint to conform to SSPC-PAINT 20 (Type I)

.2 For exterior exposed steel where surfaces are to be primed provide a Corrosion Resistant and Field “touch-up” Primer as follows:

Acceptable product:

.1 CARBOZINC 11, (Solvent based inorganic zinc)

.2 Colour, 0300 (GREEN) or 0700 (GRAY)

.3 Steel Surface Preparation:
A minimum, non-immersion SSPC-SP6 and obtain a 25 to 75 micrometres [1 – 3 mils] Angular Blast Profile.

.4 Dry Film Thickness:
50 to 75 micrometres [2 – 3 mils] applied by spray (airless or conventional) with constant agitation.

.5 Field Touch-Up:
Areas less than 0.1 m^2 [1 ft^2]: clean (SSPC SP-1) , manually abrade (SSPC SP-2 or SP-3) and touch-up with Carbozinc 859 (organic zinc, SSPC Paint 20, type II).
Areas more than 0.1 m^2 [1 ft^2]: Tape, re-blast to SSPC SP-6 and spray apply Carbozinc 11 (Inorganic Zinc, SSPC Paint 20, Type I).

.3 Where an epoxy paint (SSPC Paint 20) is specified in combination with a zinc-rich primer, provide a compatible epoxy paint as follows:

Acceptable product:

1. CARBOGUARD 890 (Cycloaliphatic Amine Epoxy)

2. Dry Film thickness: 100 to 150 micrometres [4.0-6.0 mils]

.4 For field “touch-up” of galvanized surfaces provide same product as touch-up primer.

.9 GALVANIZING: For connections at all members specified to be galvanized, provide galvanized nuts, bolts, washers, clip angles and plates etc.

PART 3 – EXECUTION

3.1 Fabrication

.1 Fabricate structural steel and joists to CSA S16 and W59, and in accordance with reviewed shop drawings.

.2 Provide drain holes in closed HSS Sections to prevent moisture build-up within the member.

.3 SHEAR STUDS

.1 Install Shear Studs as specified in accordance with CSA W59.

.2 Failure of any studs during bending of the studs to an angle of 30 degrees (towards the nearest column for composite beams) will be cause of rejection of the stud welding, and may require further testing at the consultant's discretion and at the contractor's expense.

.3 A 10% or greater failure rata at the welds of the tested studs will be cause for rejection of all the studs installed by the welder.

.4 Replacement of failed or rejected studs shall be at the contractor's expense.

3.2 Protection

.1 Refer to Section 05 12 13 "Architecturally Exposed Structural Steel" for protection requirements of Architecturally Exposed Structural Steel.

.2 Cleaning Steel

.1 Clean structural steel and joists in accordance with the table below.

.2 Clean surfaces within 50 mm (2") of any field weld location of materials which would prevent proper welding or produce objectionable fumes while welding is being completed.

.3 Painting

.1 Shop paint or galvanize structural steel in accordance with the table below. Refer also **Galvanized Sections** for additional requirements.

.2 Apply coating under cover, on dry surfaces only and when surface and air temperatures are above 5°C [41°F].

.3 Maintain dry conditions and 5°C [41°F] minimum temperature until coating thoroughly dry.

.4 Joints which are to be field welded shall be kept free of primer or other coating that could be detrimental to achieving sound weldment.

.5 FIELD TOUCH-UP for welds, scrapes, etc.

.1 General Interior Surfaces:..... With specified coating

.2 Exterior Exposed Surfaces:..... With specified coating

.3 Galvanized Surfaces: ..... GALVAFROID or approved equal

Environment	Structural Member	Preparation	Protection	Remarks
Dry enviroment with structural steel encased in concrete, or masonry, or covered in non-corrosive contact type fire proofing	Structural Steel and joists	SSPC-SP3 Power Tool Cleaning	Leave Unpainted	
Protected (Inside vapour barrier)	Structural Steel not exposed to view	SSPC-SP3 Power Tool Cleaning	CISC/CPMA 1-73a OR [Leave Unpainted]	
	Joists not exposed to view	SSPC-SP2 Hand Tool Cleaning	CISC/CPMA 1-73a or SSPC Paint 15	
	Structural Steel or Joists exposed to view, but not designated as AESS	SSPC-SP7 Brush-Off Blast Cleaning	CISC/CPMA 2-75	
Unprotected (outside vapour barrier and/or unconditioned space) but **not** exposed to chlorides. *(See note (a))*	Structural Steel	SSPC-SP7 Brush-Off Blast Cleaning + SSPC-SP8 Pickling	Hot Dip Galvanize	Note additional requirements for galvanizing in specification sections.
	Joists	[SSPC-SP6 Commercial Blast Cleaning]	[Inorganic zinc-rich primer (SSPC Paint 20, type 1)]	Note additional requirements for galvanizing in specification sections.
Unprotected (outside vapour barrier and/or unconditioned space) exposed to chlorides.	Structural Steel and Joists	SSPC-SP10 Near White Blast Cleaning	Inorganic zinc-rich primer (SSPC Paint 20, type I) and epoxy paint (SSPC Paint 22)	Provide topcoat SSPC Paint 36, Level 3, when exposed to sunlight

Notes:

(a) This includes canopies, outdoor screens, exterior mechanical support framing, shelf angles (including supporting brackets) and lintels in exterior walls.

(b) Submit proposed coating system for approval of consultant prior to application.

3.3 Galvanized Sections

.1 Apply galvanizing to all steel members as noted in clause 3.2.

.2 Fabricate all framing prior to galvanizing providing all required vent holes and cap plates to ensure complete internal and external coverage is required.

.3 Galvanize in accordance with A123/A123M to minimum coating of 610 g/m² [2 oz/ft²].

.4 All bolts, nuts, washers, connector plates, clips, etc. at member connections shall be galvanized.

.5 Galvanize members after shop welding has been completed.

.6 When welding after galvanizing is in place, grind away galvanizing at areas to be welded and touch-up with two coats of coating complying with SSPC PAINT 20, type II.

.7 In cases where galvanized framing is in contact with plain carbon steel locally provide two coats of coating to the plain steel complying with SSPC PAINT 32 where members are in contact.

.8 Where the galvanizing process of members may cause distortion of the structural framing, submit procedures for review by the Consultant and make good to tolerances noted in the contract documents.

.9 For joists, a 25 mm spacing between chord members is recommended. Provide larger spacing as required to suit the specified surface preparation.

.10 Identify at time of tender any splices or additional fabrication requirements due to the size, length or weight constraints imposed by the galvanizing process.

.11 FINISH PAINTING

Where finish painting is specified for galvanized surfaces, the galvanizer is to eliminate any after-galvanizing treatment that would normally be applied to the coating that will adversely affect paint adhesion.

3.4 Joist Bridging & Bottom Chord Roof Bracing

.1 All bridging, bracing and anchorages to be as required by the drawings and CSA S16.

3.5 Joist Bearing Anchorage

.1 Conform to Specification, Typical Details and Notes on drawings unless specifically noted otherwise.

.2 Joists bearing on steel shall be anchored with welds as shown on drawings and typical details. Welds shown are minimum.

.3 Joists bearing on masonry shall be welded to Wall Plates as shown on drawings and typical details. Welds shown are minimum.

.4 It is anticipated, in order to accommodate the roof slopes, (refer to Architectural Plans and Details) that it will be necessary to modify OWSJ shoes and/or to provide steel shims to achieve level and sound bearings. The Contractor is to provide all necessary shims, plates etc. in order to maintain uniform slopes, and sound bearing and anchorage.

.5 Anchors in Masonry for Wall Plates:

.1 Unless otherwise shown provide a minimum:

.1 For Floor Joists: ..... Refer to typical details on drawings.

.2 For Roof Joists: ..... Two (2) 20 mm [3/4″] diameter anchor rods by 600 mm [24″] long.

.2 Embed all anchors vertically and grout in solid.

3.6 Bearing/Wall Plates for Beams

.1 Provide a minimum of two (2) anchors, 12 mm [1/2″] diameter by 300 mm [12″] long with 50 mm [2″] hook, for all bearing plates on masonry shall be embedded vertically and grouted in solid unless specifically noted otherwise on the drawings.

.2 Weld beams to plates with a minimum of two (2) 3 mm x 25 mm [3/16″ x 1″] fillet welds unless noted otherwise.

3.7 Relation to Other Trades

.1 Give all necessary directions for setting anchor rods, bearing plates and other members required to be built in with the work of other trades.

.2 Verify the location and condition of all bearing surfaces placed by others. All such surfaces shall be at the elevations called for on the drawings and shall be truly level.

.3 Commencement of erection implies acceptance of the work of other sections which affect the work of this section.

.4 No claim for relief from contractual responsibility or for extras to the contract will be allowed unless such claim is made in writing prior to commencement of the work.

.5 Ensure the proper bearing surface and amount of bearing is available to support steel members including open web steel joists.

.6 Supply materials and all necessary directions for installation of all anchor rods and bearing plates, and also clips, angles and weld plates for steel deck if and as required. Co-ordinate with steel deck supplier for their actual requirements.

.7 Weld approved anchor slots at 600 mm [24″] on center for adjustable masonry anchors, on all steel surfaces to be built into masonry.

.8 Supply and install wall anchors, ceiling extensions, and header supports for trimming openings for all OWSJ.

.9 Provide and reinforce to the approval of the Consultant, openings through beams required by other trades. Obtain approval of the Consultant for location of the holes. The cost for this work shall be paid for by the trade requiring the openings. Reinforce openings to maintain required design strength.

.10 Provide at any time before the drawings are approved, punched holes from 11 mm to 27 mm [0.43″ to 1.1″] diameter for the convenience of other trades as requested by them. Holes shall be placed so as not to cause any appreciable reduction in the strength of such members.

.11 Co-ordinate with the Mechanical and Electrical Drawings and Trades to ensure that there is no interference between ductwork, suspended lighting fixtures and hangers, and the open web steel joists and bridging, or other structural steel members.

.12 Wherever items are suspended from OWSJ, the securement shall be from the top chords of the joists at panel points only. Unless specific permission is given by the Structural Consultant.

.13 Refer to drawings for CONCRETE FILLED COLUMNS.

3.8 Lintels

.1 Generally lintels will be supplied only by this section and be placed by the General Contractor.

.2 Lintels shall conform to the Lintel Schedules, Notes and Typical Details on the Structural drawings.

.3 While every effort has been made to show all lintels which occur in load bearing masonry walls, it is the Contractor’s responsibility to ensure that the correct size and quantity of lintels are provided.

.4 Lintels in non-load bearing walls and partitions are generally NOT SHOWN ON THE DRAWINGS. All such lintels shall be provided as required and shall conform to the Notes & Typical Details on the structural drawings.

.5 Refer also to **Galvanizing** earlier in this section.

3.9 Erection

.1 Commencement of erection implies acceptance of the work of other sections which affect the work of this section.

.2 No claim for relief from contractual responsibility or for extras to the contract will be allowed unless such claim is made in writing prior to commencement of the work.

.3 Conform to the requirements of CSA S16.

.4 Provide a competent and experienced supervisor.

.5 Provide all necessary temporary bracing to keep structure safe and plumb. Bracing on structural drawings is for the finished building only.

.6 Report all lack of fit to the Consultant before correction.

.7 Provide and install all necessary packing under open web steel joist shoes. Packing to be of steel so placed as to distribute the joist reaction uniformly on the bearing.

.8 Obtain written approval from the Consultant prior to field cutting or altering structural steel framing or open web steel joists or bridging.

.9 Touch-up shop primer to bolts, welds, burned or scraped surfaces at completion of erection.

.10 Provide proper coordination between the structural steel contractor, the mechanical and electrical contractors to ensure that all required openings through structural steel members or OWSJ are approved and are clearly detailed on the Shop Drawings before fabrication and erection. (Openings are to be reinforced to maintain the required design strengths.) The costs of such openings and/or for the provision of openings installed in the field, are to be borne by the Contractor or the trade requiring the opening, and are not extra to the Contract.

3.10 Tolerances

.1 Conform to CSA S16 and to the Typical Notes on the drawings.

3.11 Quality Control

.1 Implement a system of quality control to ensure that the minimum standards specified herein are attained.

.2 Bring to the attention of the Consultant any defects in the work or departures from the Contract Documents which may occur during construction. The Consultant will decide upon corrective action and give recommendations in writing.

.3 The Consultant 's general review during construction and inspection and testing by Independent Inspection and Testing Companies reporting to the Consultant are both undertaken to inform the Consultants of the Contractor's performance and shall in no way augment the Contractor's quality control or relieve the Contractor of contractual responsibility. The contractor is solely responsible for quality control and shall implement its own supervisory and quality control procedures.

.4 The structural steel fabricators shall be certified by the Canadian Welding Bureau to the requirements of CSA W47.1, division 1 or 2.

.5 Searching visual inspection aided by a magnifying glass shall be carried out regularly on all joints during the course of welding and after completion by the fabricators designated welding supervisor, and also by the inspection company's representative. Emphasis shall be placed upon visual inspection to establish correct "Fit-Up" and "Pre-heating".

.6 All welds are to be stamped with the operator's number or symbols and the fabricator's number assigned by the Canadian Welding bureau with the requirements of CSA Standard W59.

.7 Finished shop work must be inspected and approved before shipping to site and field work must be inspected and approved before the removal of erection equipment from the job.

3.12 Notification

.1 Prior to commencing significant segments of the work, give the Consultant and Independent Inspection and Testing Companies appropriate notification so as to afford them reasonable opportunity to review the work. Failure to meet this requirement may be cause for the Consultant to classify the work as defective. Advise the Inspection and Testing Company at least twenty-four (24) hours in advance of each fabrication and/or erection sequence.

3.13 Inspection and Testing

.1 The General Contractor in agreement with the Halton Catholic District School Board and Prime Consultant will appoint an Independent Inspection and Testing Companies to make inspections or perform tests as the Consultant directs. The Independent Inspection and Testing Companies shall be responsible only to the Consultant, and shall make only such inspections or tests as the Consultant may direct. The representative of the Inspection and Testing Company shall NOT be required to supervise or instruct the Contractor.

.2 The Inspection and Testing Company will conduct inspection and testing services per the following:

.1 Specification Section 01 45 23 – *Testing and Inspection Services – General Requirements.*

.3 The following are responsibilities of the contractor regarding the Inspection and Testing Company:

.1 Co-operate with the representatives of the Inspection and Testing Company.

.2 Provide the Inspection and Testing Company with a copy of Specification, Structural Drawings and reviewed copies of shop drawings.

.3 Co-ordinate a program of inspection and testing with the Inspection and Testing Company, and advise the Consultant accordingly.

3.14 Defective Materials and Work

.1 Where evidence exists that defective work has occurred or that work has been carried out incorporating defective materials, the Consultant may have tests, inspections or surveys performed, analytical calculations of structural strength, made and the like, in order to help determine whether the work must be corrected or replaced. Tests, inspections or surveys or calculations carried out under these circumstances will be made at the Contractor's expense, regardless of their results, which may be such that, in the Consultant's opinion, the work may be acceptable.

.2 All testing shall be conducted in accordance with the requirements of The Building Code, except where this would, in the Consultant's opinion, cause undue delay or give results not representative of the rejected material in place. In this case, the tests shall be conducted in accordance with the standards given by the Consultant.

.3 Materials or work which fail to meet specified requirements may be rejected by the Consultant whenever found at any time prior to final acceptance of the work regardless of previous inspection. If rejected, defective materials or work shall be promptly removed and replaced or repaired to the satisfaction of the Consultant, at no expense to the Owner.

END OF SECTION 05 21 19

PART 1 – GENERAL

1.1 General Requirements

.1 The Contractor shall ensure that no asbestos containing materials are used in connection with the work of this section.

1.2 Reference Standards

.1 Comply with The Building Code Act, as amended, the 2024 Ontario Building Code (OBC) as amended and Regulations and by-laws of other authorities having jurisdiction, including latest amendments thereto; all hereafter referred to as Building Code.

.2 All codes, standard specifications and by-laws referred to in this Specification shall be current editions including all latest revisions, addenda and supplements, unless otherwise noted in the Building Code.

.3 Conform to the following CSA Standards:

.1	S136	North American Specification for the Design of Cold Formed Steel Structural Members.
.2	W47.1	Certification of Companies for Fusion Welding of Steel.
.3	W59	Welded Steel Construction (Metal Arc Welding).

.4 Conform to the following ASTM Standards:

.1	A653/A 653M	Specification for Steel Sheet, Zinc Coated (Galvanized) or Zinc-Iron Alloy Coated (Galvannealed) by the Hot-Dip Process.

.5 Conform to the following Canadian Sheet Steel Building Institute Standards:

.1	CSSBI 10M	Standard for Steel Roof Deck.
.2	CSSBI B13	Design of Steel Deck Diaphragms.

.6 Comply with any Fire Rated Assembly Design specified for the project.

.7 In the event of conflict between reference standards, codes, drawings and specifications, the Contractor shall request clarification by the Consultant. The Consultant's decision as to which requirements govern shall be final and binding. Generally the more stringent provision shall govern. No extras to the contract will be approved due to such clarification.

.8 Conform to the Occupational Health and Safety Act, R.S.O. 1990, c. O.1, last amendment.

1.3 Design Requirements

.1 Design steel deck using limit states design in accordance with CSA S136 and CSSBI 10M.

.2 Wherever structural framing permits, steel deck shall be designed and fabricated to span continuously over at least four (4) supports (3 spans).

.3 Provide an adequate increase in thickness of metal to compensate for continuity wherever fewer supports may occur.

.4 Steel deck and connections to steel framing to carry dead, live and other loads including lateral loads, diaphragm action, and uplift as indicated.

.5 Deflection of roof deck under specified live or snow load not to exceed 1/300 of span.

1.4 Shop Drawings

.1 Submit erection drawings in accordance with directions.

.2 Fabrication shall not commence until drawings are reviewed.

.3 Indicate deck plan, profile, dimensions, base steel thickness, metallic coating designation, connections to supports and spacings, projections, openings, reinforcement details and accessories.

.4 Shop drawings are to bear the Seal and Signature of the Licensed Professional Engineer responsible for the design.

.5 When requested submit design calculations complete with Stamp and Signature of the responsible Professional Engineer.

.6 Allow ten (10) working days for the review of shop drawings and supply as many copies for review and distribution as directed. Shop drawings shall be checked in detail by the General Contractor before submission. Drawings which fail to meet this requirement shall be returned marked NOT REVIEWED.

.7 The review of such drawings shall not relieve the Contractor of the responsibility of seeing that this work is complete, accurate and in conformity with the drawings and the specification.

PART 2 – PRODUCTS

2.1 Materials

.1 STEEL SHEET to ASTM A653/A653M (Structural quality) minimum grade 275 MPa [40 ksi] with a base nominal thickness (BNT) as noted on the drawings.

.2 ZINC COATING

.1 Unless otherwise noted, provide a ZF75 (galvanneal) coating as designated by ASTM A653/A653M.

.2 Where specified on drawings as GALVANIZED DECK, provide a Z275 coating as designated by ASTM A653/A653M.

.3 Deck surfaces which are designated for finish painting (Refer to Architectural Drawings & Finish Schedules) shall not receive chemical treatment that will adversely affect paint application.

.3 TYPES OF DECKING:

.1 Roof deck: Shall be single fluted element with ribs of depth as shown on the drawings.

.2 Acoustic deck: shall be single fluted element with ribs of depths shown on the drawings and with perforations on the vertical faces of the flutes, complete with a sound absorbing strip (fiberglass density 17.6 kg/m^3 [1.1 lb. / ft^2]) supplied by the deck fabricator for installation by the roofing contractor.

.3 Pre-finished deck: where designated is to be pre-painted, provide:

.1 Colorite HMP
.2 10000 Series
.3 Metallic Series
.4 Barrier Series
.5 Weather X

Colour to be selected later by the Architect from the manufacturer's standard colour chart.

.4 Deck shall have interlocking side joints between panels.

.4 FASTENERS FOR PRE-FINISHED DECK:

.1 Unless otherwise noted, provide self-drilling or self-tapping corrosion resistant fasteners.
Acceptable type: #14 TEK screws or an approved equivalent.

.5 CLOSURES:

.1 Provide cover plates, edge stiffeners, cell closures and flashings from sheet steel similar to decking with a base nominal thickness of 0.76 mm [0.03″] (22 gauge). (Refer to Architectural Drawings).

.2 Provide and install closures at the top of all walls. Type to match the profile and finish of selected decking.

.6 PRIMER: conform to CAN/CGSB-1.181

.1 Acceptable product: CARBOZINC II by Carboline.

.7 METAL UPSTANDS/CURBS:

.1 Where required by the Architectural Drawings provide and install 1.6 mm [0.063″] (16 gauge) galvanized metal upstands.

PART 3 – EXECUTION

3.1 Preparation

.1 Verify the location and condition of all bearing surfaces placed by others. All such surfaces shall be at the elevation called for on the drawings.

.2 Commencement of erection implies acceptance of the work of other sections, which affect the work of this section.

.3 No claim for relief from contractual responsibility or for extras to the contract will be allowed unless such claim is made in writing prior to commencement of the work.

.4 Protect steel deck during shipping and handling in accordance with CSSBI standards.

.5 The steel deck welder must be certified to CSA W47.1 for fusion welding of steel deck.

3.2 Fabrication & Erection

.1 Conform to CSA S136, CSA W59, CCSBI 10M.

.2 Erect steel decking as indicated to manufacturer’s direction and to reviewed shop drawings.

.3 No hangers or brackets supporting mechanical and electrical services, artwork, ceilings, bulkheads, lighting, etc. shall be hung directly from the floor or roof deck. All point loads must be applied directly to structural steel framing unless otherwise shown or approved by structural consultant.

.4 Accurately align the deck and lap at supports. Use 50 mm [2″] minimum lap.

.5 Supply and place steel packing as required to produce an even bearing pressure at supports.

.6 Any material which has been damaged shall be replaced at no expense to the owner.

.7 Provide for ribs to bear on beams parallel to flutes when tops of such beams are at same elevation as deck bearing.

.8 Provide reinforcing stiffeners for unsupported edges of metal deck.

.9 Install 50 x 50 x 6 mm [2″ x 2″ x ¼″] steel angles or formed channels perpendicular to flutes, welded to 2 flutes each side of opening for deck openings from 150 to 450 mm [6″ to 18″] in size. No reinforcement required for openings cut in the deck that are smaller than 150 mm [6″] square.

.10 For deck openings over 450 mm [18″] and for areas of concentrated load, reinforce in accordance with structural framing details.

.11 Install closures and upstands as shown on drawings and reviewed shop drawings.

.12 After alignment and levelling and unless otherwise noted on drawings, the minimum attachment of the deck to the bearing surfaces and the minimum side lap connections between deck units shall be:

.1 For 38 mm deck profiles, connect the first, third, fifth and seventh low corrugations (36/4 configuration), and each support parallel to flute direction at 300 mm [12″] maximum centers. Connections shall be made using either an arc spot weld with 20 mm [3/4″] nominal top diameter, or mechanically fastened using Hilti powder actuated fasteners (X-HSN24, HILTI X-ENP19, or equivalent).

.2 Side laps of adjacent nestable units shall be crimped together at 900 mm [36″] centres, or fastened with Hilti M HWH screws (SLCO1, SLC02, or equivalent) at 900mm [36”] on centre.

.13 Immediately after decking is permanently secured in place, where top and/or bottom surfaces have been burned by welding or where surface coating has been damaged during transit or in erection.

.1 Touch-up galvannealed surfaces with coating complying with SSPC-PAINT 20.

3.3 Quality Control

.1 Implement a system of quality control to ensure that the minimum standards specified herein are attained.

.2 Bring to the attention of the Consultant any defects in the work or departures from the Contract Documents which may occur during construction. The Consultant will decide upon corrective action and give recommendations in writing.

.3 The Consultant 's general review during construction and inspection and testing by Independent Inspection and Testing Companies reporting to the Consultant are both undertaken to inform the Consultants of the Contractor's performance and shall in no way augment the Contractor's quality control or relieve the Contractor of contractual responsibility. The contractor is solely responsible for quality control and shall implement its own supervisory and quality control procedures.

3.4 Notification

1. Prior to commencing significant segments of the work, give the Consultant and Independent Inspection and Testing Companies appropriate notification so as to afford them reasonable opportunity to review the work. Failure to meet this requirement may be cause for the Consultant to classify the work as defective.

3.5 Inspection and Testing

1. The General Contractor in agreement with the Halton Catholic District School Board and Prime Consultant will appoint an Independent Inspection and Testing Companies to make inspections or perform tests as the Consultant directs. The Independent Inspection and Testing Companies shall be responsible only to the Consultant, and shall make only such inspections or tests as the Consultant may direct. The representative of the Inspection and Testing Company shall NOT be required to supervise or instruct the Contractor.

2. The Inspection and Testing Company will conduct inspection and testing services per the following:

.1 Specification Section 01 45 23 – *Testing and Inspection Services – General Requirements.*

.3 The following are responsibilities of the contractor regarding the Inspection and Testing Company:

.1 Co-operate with the representatives of the Inspection and Testing Company.

.2 Provide the Inspection and Testing Company with a copy of Specification, Structural Drawings and reviewed copies of shop drawings.

3.6 Defective Materials and Work

.1 Where evidence exists that defective work has occurred or that work has been carried out incorporating defective materials, the Consultant may have tests, inspections or surveys performed, analytical calculations of structural strength, made and the like, in order to help determine whether the work must be corrected or replaced. Tests, inspections or surveys or calculations carried out under these circumstances will be made at the Contractor's expense, regardless of their results, which may be such that, in the Consultant's opinion, the work may be acceptable.

.2 All testing shall be conducted in accordance with the requirements of The Building Code, except where this would, in the Consultant's opinion, cause undue delay or give results not representative of the rejected material in place. In this case, the tests shall be conducted in accordance with the standards given by the Consultant.

.3 Materials or work which fail to meet specified requirements may be rejected by the Consultant whenever found at any time prior to final acceptance of the work regardless of previous inspection. If rejected, defective materials or work shall be promptly removed and replaced or repaired to the satisfaction of the Consultant, at no expense to the Owner.

END OF SECTION 05 31 23

Part 1 General

1.1 RELATED SECTIONS

.1 Section 01 33 00 - Submittal Procedures.

.2 Section 03 30 00 - Cast-in-Place Concrete.

.3 Section 04 21 13 – Masonry.

.4 Section 05 12 23 - Structural Steel.

.5 Section 05 21 00 - Steel Joist Framing.

.6 Section 05 31 00 - Steel Deck.

.7 Section 09 91 22 - Painting.

1.2 REFERENCES

.1 American Society for Testing and Materials International, (ASTM)

.1 ASTM A53/A53M-[02], Specification for Pipe, Steel, Black and Hot-Dipped, Zinc-Coated Welded and Seamless.

.2 ASTM A269-[02], Specification for Seamless and Welded Austenitic Stainless Steel Tubing for General Service.

.3 ASTM A307-[02], Specification for Carbon Steel Bolts and Studs, 60,000 PSI Tensile Strength.

.2 Canadian General Standards Board (CGSB)

.1 CAN/CGSB-1.40-[97], Anti-corrosive Structural Steel Alkyd Primer.

.2 CAN/CGSB-1.181-[92], Ready-Mixed, Organic Zinc-Rich Coating.

.3 Canadian Standards Association (CSA International)

.1 G40.20-04: General Requirements for Rolled or Welded Structural Quality Steel

.2 G40.21-04 (R2009): Structural Quality Steel

.3 CAN/CSA G164-M92 (R2003): Hot Dip Galvanizing of Irregularly Shaped Articles

.4 CSA S16.1-09: Limit States Design of Steel Structures

.5 CSA W47.1-09: Certification of Companies for Fusion Welding of Steel

.6 CSA W59-03 (R2008): Welded Steel Construction (Metal Arc Welding)

.4 The Environmental Choice Program

.1 CCD-047a-[98], Paints, Surface Coatings.

.2 CCD-048-[98], Surface Coatings - Recycled Water-borne.

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1.3 SUBMITTALS

.1 Shop Drawings

.1 Submit shop drawings in accordance with Section 01 33 00 - Submittal Procedures.

.2 Indicate materials, core thicknesses, finishes, connections, joints, method of anchorage, number of anchors, supports, reinforcement, details, and accessories.

1.4 DELIVERY, STORAGE, AND HANDLING

.1 Packing, Shipping, Handling and Unloading:

.1 Deliver, store, handle and protect materials in accordance with Section 01 61 00 - Common Product Requirements.

.2 Storage and Protection:

.1 Cover exposed stainless-steel surfaces with pressure sensitive heavy protection paper or apply strippable plastic coating, before shipping to job site.

.2 Leave protective covering in place until final cleaning of building. Provide instructions for removal of protective covering.

1.5 WASTE MANAGEMENT AND DISPOSAL

.1 Remove from site and dispose of packaging materials at appropriate recycling facilities.

.2 Divert unused metal materials from landfill to metal recycling facility approved by Consultant.

Part 2 Products

2.1 MATERIALS

.1 Steel sections and plates: to CSA-G40.20/G40.21, Grade 350 for hollow structural sections and Grade 300W for Plates and Flat Shapes.

.2 Welding materials: to CSA W59.

.3 Bolts and anchor bolts: to ASTM A307.

.4 Stainless steel tubing: to ASTM A269, Type 302 or 304 alloy, Seamless welded with AISI No. 4 finish.

.5 Grout: non-shrink, non-metallic, flowable, 15 MPa at 24 hours.

2.2 PRIMERS, COATINGS AND SHOP PAINTING

.1 Interior Steel in Dry Areas: Quick drying oil alkyd conforming to CISC/CPMA 2.75.

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.2 Exterior Steel, Interior Steel in Unheated Areas, Steel Embedded in Concrete**:** Hot dip galvanized conforming to CSA G164, minimum Z275 coating. Galvanizing of structural steel components and loose lintels: refer to Section 05 12 23.

.3 Galvanized Coating Touch-Up**:** W.R. Meadows "Galvafroid" or Kerry Industries "Z.R.C." zinc rich coating or similar manufacturer containing minimum 90% zinc by weight.

.4 Apply two (2) shop coat(s) of primer or coating as indicated above and according to manufacturers recommendations. Do not prime aluminum, stainless steel or those components to be galvanized or encased in concrete.

.5 Use primer unadulterated, as provided by manufacturer. Paint on dry surfaces free from rust scale and grease. Do not paint when temperature is lower than 10 deg. Celsius and rising.

.6 Clean surfaces to be field welded; do not paint.

2.3 FASTENINGS

.1 Use nuts and bolts conforming to ASTM A307, A325, and A563 as applicable.

.1 For interior work, use cadmium-plated fastenings where other protection is not specified.

.2 For exterior work, use Type 300 or 400 stainless steel.

2.4 ANCHORS AND SHIMS

.1 For exposed anchorage of aluminum, if applicable, use stainless steel and otherwise to match metal anchored. For non-exposed work, anchors and shims may be galvanized steel.

2.5 PIPE

.1 To ASTM A53, extra strong steel pipe for bollards.

2.6 BITUMINOUS PAINT

.1 Alkali-resisting to meet specified requirements of CAN/CGSB-1.108, Type 2. Use to insulate contact between dissimilar metals.

2.7 FABRICATION

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

.2 Use self-tapping shake-proof flat headed screws on items requiring assembly by screws or as indicated.

.3 Where possible, fit and shop assemble work, ready for erection.

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.4 Ensure exposed welds are continuous for length of each joint. File or grind exposed welds smooth and flush.

.5 Weld all connections where possible, and bolt where not possible unless indicated otherwise on drawings.

.6 Weld all stainless steel by the Argon Arc Process. Grind smooth and polish joints, crence-free, and flush without seams.

2.8 LIST OF MISCELLANEOUS METAL FABRICATIONS

.1 This Section includes, but is not limited to the following list. Note: Galvanize all exterior items and other items noted. Prime paint all interior items.

.1 Anchors, Bolts, Inserts, Sleeves for work in this Section.
.2 Bench Supports and Shelf Brackets (see ADs).
.3 Stairs, railings, handrails.
.4 Stainless Steel handrails.
.5 Mechanical Room Steel Stairs, railings, handrails.
.6 Metal Swing Gate.
.7 Hangers and Supports (for work in this Section).
.8 Lintels (if not by Structural Steel).
.9 Bollards (see ADs)
.10 Cross
.11 Gates (see ADs)
.12 Shelf Brackets and Hooks (see Drawings)
.13 Steel Ladders, rungs & guardrails (see ADs)
.14 HSS columns at Garbage Bin Enclosure (see ADs).
.15 Miscellaneous steel L-angle dividers for Applications Classroom -Wood Storage Compartment (see ADs).
.16 Miscellaneous angles at edges of exposed ceilings to cover insulation in deck flutes.
.17 Miscellaneous steel trim angles at doors where intumescent paint is applied.

Part 3 Execution

3.1 GENERAL

.1 Supply and install all miscellaneous metal work indicated on the Drawings and not indicated in work of other Sections in addition to items listed below.

3.2 ERECTION

.1 Do welding work in accordance with CSA W59 unless specified otherwise.

□

.2 Erect metalwork square, plumb, straight, and true, accurately fitted, with tight joints and intersections.

.3 Provide suitable means of anchorage acceptable to Consultant such as dowels, anchor clips, bar anchors, expansion bolts and shields, and toggles.

.4 Exposed fastening devices to match finish and be compatible with material through which they pass.

.5 Provide components for building by other sections in accordance with shop drawings and schedule.

.6 Make field connections with bolts to CSA-S16.1, or weld.

.7 Hand items over for casting into concrete or building into masonry to appropriate trades together with setting templates.

.8 Touch-up rivets, field welds, bolts and burnt or scratched surfaces after completion of erection with primer.

.9 Touch-up galvanized surfaces with zinc rich primer where burned by field welding. Spray or brush apply a minimum of three (3) coats of zinc-rich paint to achieve a dry film thickness of 8 mils. Apply a finish coat of aluminum paint to provide a colour blend with the surround galvanizing.

3.3 WALL UPPER SHELF

.1 Steel Angles, Steel Channel, Flat Bar Steel, Steel Rod as indicated on details.

.2 Use secure round head fasteners or countersink holes for flat head screws.

.3 Prime paint: Galvafroid.

.4 Chamfer cut ends of Rod 2 mm.

.5 Refer to AD drawings.

3.4 MECHANICAL ROOM STEEL STAIRS

.1 Refer to Structural Drawing for Stair Construction Components.

.2 Refer to Drawing A20 for dimensions, location, and guardrail details.

.3 Note: install stairs, handrails, plumb, level, rigid and secure, as per details shown on Drawings.

3.5 GATE

.1 Welded steel pipe construction, as shown on AD 217. Galvanize after fabrication.

□

3.6 ACCESS STAIR & LADDER

.1 Fabricate interior and exterior roof access ladders as described on drawings AD 515 & AD 516. Typical Construction is detailed on Structural Drawings.

3.7 WALL BRACKETS AND HOOKS

.1 As shown on Drawings - prime paint.

3.8 BOLLARDS

.1 Supply and install galvanized steel bollards as shown on Drawings. Bollards shall be 150 mm x 9.5 mm thick wall at 1200 mm high, seamless steel pipe. Install 1200 mm into a concrete foundation. Fill bollard with 25 MPa concrete and round top. Round top of footing also. For number of Bollards required - refer to Drawings.

.2 Refer to drawing AD 209.

3.9 CROSS (Exterior Front Façade)

.1 Supply and install cross as described on drawing 5/A07 “Aluminum Cross Detail”.

.2 Fabricate from aluminum with closed ends and returns

.3 Clear anodized finish, weather resistant.

.4 Fasten to exterior façade offset from steel building framing with pins.

3.10 GARBAGE BIN ENCLOSURE

.1 Refer to drawings AD 221 & AD 222 for details.

3.11 GALVANIZED STEEL

.1 Galvanize steel members, fabrications, and assemblies after fabrication by the hot dip process in accordance with CSA G164, minimum Z275 coating.

.2 Galvanize bolts, nuts and washers and iron and steel hardware components in accordance with CSA G164.

.3 Safeguard products against steel embrittlement in conformance with ASTM A143.

.4 Design features which may lead to difficulties during galvanizing shall be pointed out prior to dipping.

.5 The composition of metal in the galvanizing bath shall be not less than 98.0% zinc.

3.12 CLEANING

.1 Perform cleaning after installation to remove construction and accumulated environmental dirt.

□

.2 Upon completion of installation, remove surplus materials, rubbish, tools and equipment barriers.

END OF SECTION

□

Part 1 General

1.1 RELATED SECTIONS

.1 Section 03 10 00 – Concrete Forms and Accessories.

.2 Section 08 11 14- Steel Doors and Frames.

.3 Section 07 50 13 – Common Work Results for Roofing*

.4 Section 07 50 16 – Rough Carpentry for Roofing *coordinate responsibilities with this Section and Work Division Table in Section 07 50 13.

1.2 REFERENCES

.1 Canadian Standards Association (CSA International)

.1 CSA B111-[1974(R1998)], Wire Nails, Spikes and Staples.

.2 CAN/CSA-G164-[M92(R1998)], Hot Dip Galvanizing of Irregularly Shaped Articles.

.3 CSA O121-[M1978(R1998)], Douglas Fir Plywood.

.4 CAN/CSA-O141-[91(R1999)], Softwood Lumber.

.5 CSA O151-[M1978(R1998)], Canadian Softwood Plywood.

.6 CAN/CSA-O325.0-[92(R1998)], Construction Sheathing.

.2 National Lumber Grades Authority (NLGA)

.1 Standard Grading Rules for Canadian Lumber [2000].

1.3 QUALITY ASSURANCE

.1 Lumber identification: by grade stamp of an agency certified by Canadian Lumber Standards Accreditation Board.

.2 Plywood identification: by grade mark in accordance with applicable CSA standards.

.3 Plywood, OSB and wood based composite panel construction sheathing identification: by grademark in accordance with applicable CSA standards.

1.4 WASTE MANAGEMENT AND DISPOSAL

.1 Remove from site and dispose of packaging materials at appropriate recycling facilities.

.2 Divert unused wood materials from landfill to recycling, reuse, composting facility approved by Consultant.

.3 Do not dispose of preservative treated wood through incineration.

.4 Do not dispose of preservative treated wood with materials destined for recycling or reuse.

□

.5 Dispose of treated wood, end pieces, wood scraps and sawdust at sanitary landfill approved by Consultant.

.6 Dispose of unused wood preservative material at official hazardous material collections site approved by Consultant.

.7 Do not dispose of unused preservative material into sewer system, into streams, lakes, onto ground or in other locations where they will pose health or environmental hazard.

Part 2 Products

2.1 LUMBER MATERIAL

.1 Lumber: unless specified otherwise, softwood, S4S, moisture content 19% or less in accordance with following standards:

- .1 CAN/CSA-O141.
- .2 NLGA Standard Grading Rules for Canadian Lumber.

.2 Furring, blocking, nailing strips, grounds, rough bucks, cants, curbs, fascia backing and sleepers:

- .1 Douglas fir Graded 122-C, construction or No. 2 Pine, pressure treated in accordance with CSA 080M.
- .2 Board sizes: "Standard" or better grade.
- .3 Dimension sizes: "Standard" light framing or better grade.
- .4 Post and timbers sizes: "Standard" or better grade.

2.2 PANEL MATERIALS

.1 Douglas fir plywood (DFP): to CSA O121, standard construction, good one side with waterproof adhesive.

2.3 ACCESSORIES

.1 Nails, spikes, staples, screws, bolts anchors lag screws, special fastening devices and supports required for erection of all carpentry components: to CSA B111. Use galvanized components where exposed to exterior atmosphere.

2.4 FINISHES

.1 Galvanizing: to CAN/CSA-G164, use galvanized fasteners for exterior work and interior highly humid areas.

Part 3 Execution

3.1 GENERAL

.1 Supply and install all other carpentry shown on drawings or as required for completion of work. Co-operate with other trades in installing items supplied by other sections, cut openings in woodwork when so required and make good disturbed surfaces.

3.2 PREPARATION

.1 Do all wood framing in accordance with the Ontario Building Code and Can3-086M-1983.

.2 Machine dressed work shall be slow fed using sharp cutters and finished members shall be free from drag, feathers, slivers or roughness of any kind.

.3 Frame materials with tight joints rigidly held in place.

.4 Design construction methods for expansion and contraction of the materials.

.5 Erect work plumb, level, square and to required lines.

.6 Be responsible for methods of construction for ensuring that materials are rigidly and securely attached and will not be loosened by the work of other trades.

3.3 FURRING AND BLOCKING

.1 Supply and install furring and blocking, required.

.2 Align and plumb faces of furring and blocking to tolerance of 1:600.

3.4 ROUGH BUCKS AND NAILERS

.1 Install wood bucks and nailers, as indicated, including wood bucks and linings around frames for doors and windows.

.2 Except where indicated, otherwise, use material at least 38 mm thick secured with 9 mm bolts located within 300 mm from ends of members and uniformly spaced at 1200 mm between.

.3 Countersink bolts where necessary to provide clearance for other work.

3.5 ROOF FASCIAS, CANTS, NAILERS CURBS

.1 Install wood cants, fascia backing, nailers, curbs and other wood supports for roofing, sheet metal fork, roof mounted equipment.

.2 Secure with galvanized 9 mm bolts, where indicated, galvanized nails elsewhere. Locate fastenings within 300 mm from ends and uniformly spaced between. Space bolts at 1200 mm and nails at 600 mm centres, except where indicated otherwise.

□

.3 Staple vapour retardant sheet strip to underside of nailers before installation. Apply strip continuous with 200 mm overlap at joints, free of wrinkles and tears, with at least 200 mm exposed for overlap on roof deck.

.4 Install wood nailers for roof hoppers, dressed, tapered and recessed slightly below top surface of roof insulation.

3.6 PRESSURE TREATED WOOD

.1 Use wood pressure treated in accordance with CSA 080M for all wood members in contact with exterior walls and roofs.

.2 Re-treat surfaces exposed by cutting, trimming or boring with liberal brush application of preservative before installation.

3.7 GARBAGE ENCLOSURE DOORS

.1 Supply and install 38 mm x 140 mm pressure treated wood slats to front of garbage enclosure doors.

.2 Fasten each slat to steel frames with 2 screws at top, bottom and at diagonal bracing.

3.8 INSTALLATION OF HOLLOW METAL FRAMES

.1 Set frames plumb and square in their exact location and at correct elevation. Firmly block and brace to prevent shifting. Shim up where required to ensure proper alignment dimensions from finished floor to head of frame. Install temporary wood spreaders at mid-height.

.2 Where pressed steel frames are installed in concrete walls, secure frames to concrete using lead expansion shields and anchor bolts through pipe sleeves. Perform drilling of concrete as required. Fill recessed bolt heads flush to frame face with approved metal filler and sand smooth.

.3 Install fire rated door frames in accordance with requirements of National Fire Code Volume 4, produced by The National Fire Protection Association (NFPA 80).

3.9 GENERAL

.1 Supply and install all other carpentry shown on drawings or as required for completion of work. Co-operate with other trades in installing items supplied by other sections, cut openings in woodwork when so required and make good disturbed surfaces.

3.10 ERECTION

.1 Frame, anchor, fasten, tie and brace members to provide necessary strength and rigidity.

.2 Countersink bolts where necessary to provide clearance for other work.

□

3.11 SCHEDULES

.1 Provide electrical equipment backboards for mounting electrical equipment as indicated. Use 19mm thick plywood on 19 x 38 mm furring around spacing, perimeter and at maximum 300 mm intermediate

END OF SECTION

□

PART 1 – GENERAL

1.1 General Instructions

.1 Make a thorough examination of the drawings, the specifications and the site, to determine the intent, extent, materials, and conditions of interfacing with other work and to be fully cognizant of requirements.

1.2 Reference Standards

.1 Comply with The Building Code Act, as amended, the 2024 Ontario Building Code (OBC) as amended and Regulations and by-laws of other authorities having jurisdiction, including latest amendments thereto; all hereafter referred to as Building Code.

.2 All codes, standard specifications and by-laws referred to in this Specification shall be current editions including all latest revisions, addenda and supplements, unless otherwise noted in the Building Code.

.3 Conform to the following CSA Standards:

.1	B111	Wire Nails, Spikes and Staples.
.2	G40.20/G40.21	General Requirements for Rolled or Welded Structural Quality Steel.
.3	G164	Hot Dip Galvanizing of Irregularly Shaped Articles.
.4	O80 Series	Wood Preservation.
.5	O86	Engineering Design in Wood.
.6	O112.9	Evaluation of Adhesives for Structural Wood Products (Exterior Exposure).
.7	O112.10	Evaluation of Adhesives for Structural Wood Products (Limited Moisture Exposure).
.8	O122	Structural Glued-Laminated Timber.
.9	O177	Qualification Code for Manufacturers of Structural Glued-Laminated Timber.
.10	S16	Design of Steel Structures.
.11	W47.1	Certification of Companies for Fusion Welding of Steel.

.4 Conform to the following ASTM Standards:

.1	A307	Standard Specification for Carbon Steel Bolts, Studs, and Threaded Rod 60000 PSI Tensile Strength.
.2	A653/A653M	Standard Specification for Steel Sheet, Zinc Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process.
.3	A36/A36M	Standard Specification for Carbon Structural Steel.

.5 Conform to CGSB-1.40, Anti-Corrosive Structural Steel Alkyd Primer.

.6 In the event of conflict between reference standards, codes, drawings and specifications, the Contractor shall request clarification by the Consultant. The Consultant's decision as to which requirements govern shall be final and binding. Generally the more stringent provision shall govern. No extras to the contract will be approved due to such clarification.

.7 Conform to the Occupational Health and Safety Act, R.S.O. 1990, c. O.1, last amendment 2014, c. 10, Sched. 4.

1.3 Source Quality Assurance

.1 Manufacture structural glued-laminated members in a plant certified as conforming to the requirements of CSA O177.

.2 If requested, submit a certificate in accordance with CSA O177, Appendix B, at completion of fabrication.

.3 If requested, provide certification that the protective sealer complies with the specified requirements.

.4 Place authorization labels on glued-laminated members indicating manufacture in a CSA certified plant.

.5 Fabricator of steel connections to be certified by the Canadian Welding Bureau to the requirements of CSA W47.1

.6 Erection to be performed by an organization experienced in glued-laminated timber construction. Provide references when requested.

1.4 Design of Details and Connections

.1 Design details and connections by a licenced Professional Engineer to resist forces, moments and shears indicated on or implied by the drawings.

1.5 Shop Drawings

.1 Provide erection drawings having a scale no less than the structural framing plans and detail drawings of individual members and complete information necessary for fabrication and erection.

.2 Copies of Structural Framing Plans and Sections utilized as erection drawings are not permitted unless permission is first sought from and granted by the Structural Consultant.

.3 Submit shop drawings for review as directed.

.4 All shop drawings shall bear a Seal and Signature of a licenced Professional Engineer for items designed by the fabricator or manufacturer.

.5 Fabrication shall not commence until shop drawings are reviewed.

.6 Allow ten (10) working days for the review of drawings and supply as many copies for review and distribution as directed. Shop drawings shall be checked in detail by the Contractor and shall bear the checker's initials before submission.

.7 Drawings which fail to meet these requirements shall be returned marked NOT REVIEWED and must be re-submitted after correction.

.8 The review of shop drawings shall not relieve the Contractor of the responsibility of seeing that this work is complete, accurate and in conformity with the drawings and this specification.

.9 Only shop drawings bearing the review stamps shall be kept at the site.

PART 2 - PRODUCTS

2.1 Materials

.1 Laminating stock to comply with CSA O122:

- .1 Douglas Fir – Larch
- .2 Hem Fir and Douglas Fir – Larch
- .3 Lodgepole Pine and/or Spruce

.2 Adhesive to comply with CSA O112 Series: to suit grade of service required in accordance with CSA O122.

.3 Sealer: Penetrating type, clear, non-yellowing liquid.

.4 Fasteners/Connections:

- .1 Split Ring Connectors in accordance with SAE 1010 and the SAE Handbook.
- .2 Shear Plate Connectors in accordance with SAE 1010 and the SAE Handbook.

.3 Bolts: to ASTM A307.
.4 Lag Screws: to ASME B18.2.1.
.5 Side Plates: to CSA G40.21.
.6 Drift Pins: to ASTM A307 or CSA G40.21.
.7 Nails and Spikes: to CSA B111.
.8 Truss Plates: to ASTM A653.
.9 Glued-Laminated Rivets: to CSA G40.21 or ASTM A36.

.5 Galvanizing: to CSA G164 minimum zinc coating 610 g/m² [18 oz/yd²].

Note: for connections specified to be galvanized, provide galvanized nuts, bolts, washers, nails and spikes as required.

.6 Shop Coat Primer: to CAN/CGSB 1.40.

.7 Other materials or products, which are not listed herein, shall comply with the latest CSA, ASTM, CGSB, or ACI standards appropriate to those materials. Submit brand names and manufacturer's data sheets for review, if requested.

PART 3 - EXECUTION

3.1 Fabrication

.1 Fabricate members to the following classifications:

.1 Stress Grades, Service Grades, and Appearance Grades: As noted on drawings.

.2 Sealer:

.1 Apply protective sealer before shipping unless noted otherwise.

.2 Do not apply sealer to surfaces which are to receive a stained finish or preservative treatment.

.3 Preservative Treatment:

.1 After fabrication, pressure treat indicated members with preservative and/or fire retardant in accordance with CSA O80 Series.

.4 Prime Paint connections after fabrication.

.5 Galvanize indicated connections after fabrication.

.6 Mark members for identification during erection. Marks not to be visible in final assembly.

3.2 Delivery, Storage and Handling

.1 Deliver, handle, store and protect materials of this section in accordance with directions.

.2 Wrap members prior to leaving plant with a moisture resistant wrapping.

.3 Use padded, non-marring slings for handling glued-laminated members.

.4 Protect corners with wood blocking.

.5 Slit underside of membrane covering during storage at site. Do not deface member.

.6 Store glued-laminated units protected from weather, block off ground and separate with continuous blocking, so air may circulate around all faces of members.

.7 Cover glued-laminated units with opaque moisture resistant membrane if stored outside.

.8 Make adequate provisions for delivery and handling stresses.

3.3 Erection

.1 Ensure protective sealer is not damaged before erection. If damaged, “touch-up” on site before erection.

.2 Erect glued-laminated members in accordance with reviewed shop drawings.

.3 Brace and anchor members until permanently secured by structure.

.4 Make adequate provisions for erection stresses.

.5 Do not field cut or alter members without Consultant’s approval.

3.4 Field Quality Control

.1 Notify Structural Consultant for a review of preparations prior to installation of members and also for a review after installation prior to closing in work.

.2 Additional inspection and testing may be carried out by a qualified Inspection and Testing Agency appointed by the Architect.

.1 The cost of this additional inspection shall be paid for out of the Cash Allowances for Inspection and Testing.

.3 Any inspection or testing required because of an error by the Contractor or due to departure from the construction documents by the Contractor shall be paid for by the Contractor.

.4 The Contractor shall provide the necessary cooperation to ensure that the inspection can proceed.

.5 Inspection does not relieve the Contractor of the responsibility for the performance of the Contract. The Contractor is solely responsible for quality control and shall implement appropriate 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 of work.

3.5 Quality Control

.1 Implement a system of quality control to ensure that the minimum standards specified herein are attained.

.2 Bring to the attention of the Consultant any defects in the work or departures from the Contract Documents which may occur during construction. The Consultant will decide upon corrective action and give recommendations in writing.

.3 The Consultant 's general review during construction and inspection and testing by Independent Inspection and Testing Companies reporting to the Consultant are both undertaken to inform the Consultants of the Contractor's aperformance and shall in no way augment the Contractor's quality control or relieve the Contractor of contractual responsibility.

3.6 Notification

.1 Prior to commencing significant segments of the work, give the Consultant and Independent Inspection and Testing Companies appropriate notification so as to afford them reasonable opportunity to review the work. Failure to meet this requirement may be cause for the Consultant to classify the work as defective.

3.7 Inspection and Testing

.1 The General Contractor in agreement with the Halton Catholic District School Board and Prime Consultant will appoint an Independent Inspection and Testing Companies to make inspections or perform tests as the Consultant directs. The Independent Inspection and Testing Companies shall be responsible only to the Consultant, and shall make only such inspections or tests as the Consultant may direct. The representative of the Inspection and Testing Company shall NOT be required to supervise or instruct the Contractor.

3.8 Defective Materials and Work

.1 Where evidence exists that defective work has occurred or that work has been carried out incorporating defective materials, the Consultant may have tests, inspections or surveys performed, analytical calculations of structural strength, made and the like, in order to help determine whether the work must be corrected or replaced. Tests, inspections or surveys or calculations carried out under these circumstances will be made at the Contractor's expense, regardless of their results, which may be such that, in the Consultant's opinion, the work may be acceptable.

.2 All testing shall be conducted in accordance with the requirements of The Building Code, except where this would, in the Consultant's opinion, cause undue delay or give results not representative of the rejected material in place. In this case, the tests shall be conducted in accordance with the standards given by the Consultant.

.3 Materials or work which fail to meet specified requirements may be rejected by the Consultant whenever found at any time prior to final acceptance of the work regardless of previous inspection. If rejected, defective materials or work shall be promptly removed and replaced or repaired to the satisfaction of the Consultant, at no expense to the Owner.

END OF SECTION 06 18 00

Part 1 General

1.1 RELATED SECTIONS

.1 Section 01 33 00 - Submittal Procedures.

.2 Section 06 10 11 – Rough Carpentry.

.3 Section 06 47 00 – Plastic Laminates.

.4 Section 08 80 50 – Glazing.

1.2 REFERENCES

.1 American National Standards Institute (ANSI)

.1 ANSI A208.1-[99], Particleboard.

.2 ANSI A208.2-[94], Medium Density Fiberboard (MDF).

.2 American Society for Testing and Materials (ASTM)

.1 ASTM E1333-[96], Standard Test Method for Determining Formaldehyde Concentrations in Air and Emission Rates From Wood Products Using a Large Chamber.

.2 ASTM D2832-[92(R1999)], Standard Guide for Determining Volatile and Non-volatile Content of Paint and Related Coatings.

.3 ASTM D5116-[97], Standard Guide for Small-Scale Environmental Chamber Determinations of Organic Emissions from Indoor Materials/Products.

.3 Canadian General Standards Board (CGSB)

.1 CAN/CGSB-71.20-[M88], Adhesive, Contact, Brushable.

.4 Canadian Standards Association (CSA)

.1 CSA B111-[74(R1998)], Wire Nails, Spikes and Staples.

.2 CSA O112.4-[M1977(R1999)], Standards for Wood Adhesives.

.3 CSA O112.5-Series-M-[1977(R1999)], Urea Resin Adhesives for Wood (Room- and High-Temperature Curing).

.4 CSA O112.7-Series M-[1977(R1999)], Resorcinol and Phenol-Resorcinol Resin Adhesives for Wood (Room- and Intermediate-Temperature Curing).

.5 CSA O115-[M1982(R2001)], Hardwood and Decorative Plywood.

.6 CSA O121-[M89(R1998)], Douglas Fir Plywood.

.7 CAN/CSA O141-[91R1999], Softwood Lumber.

.8 CSA O151-[M1978(R1998)], Softwood Plywood.

.9 CSA O153-[M1980(R1998)], Poplar Plywood.

.10 CSA Z760-[94], Life Cycle Assessment.

.5 Environmental Choice Program (EPC)

□

.1 ECP-44-[92], Adhesives.

.2 ECP-45-[92], Sealants and Caulking Compounds.

.3 ECP-76-[98], Surface Coatings.

.6 International Organization for Standardization (ISO)

.1 ISO 14040-[97], Environmental Management-Life Cycle Assessment - Principles and Framework.

.2 ISO 14041-[98], Environmental Management-Life Cycle Assessment - Goal and Scope Definition and Inventory Analysis.

.7 National Electrical Manufacturers Association (NEMA)

.1 NEMA LD-3-[95].

.8 National Hardwood Lumber Association (NHLA)

.1 Rules for the Measurement and Inspection of Hardwood and Cypress [, January 1996].

.9 National Lumber Grades Authority (NLGA)

.1 Standard Grading Rules for Canadian Lumber [, 2000].

1.3 SHOP DRAWINGS

.1 Submit shop drawings in accordance with Section 01 33 00 - Submittal Procedures.

.2 Indicate details of construction, profiles, jointing, fastening and other related details.

.1 Scales: profiles full size, details 1/2 full size.

.3 Indicate materials, thicknesses, finishes and hardware.

1.4 SAMPLES

.1 Submit samples in accordance with Section 01 33 00 - Submittal Procedures.

.2 Submit duplicate samples: sample size 300 x 300 mm samples of each type of paneling laminate, melamine and each type of solid wood or plywood to receive stain or natural finish.

.3 Submit a typical prototype unit representative of the work of this section.

1.5 QUALIFICATION

.1 Millwork manufacturer to have not less than 5 years proven first class experience in institutional millwork and shall be able to provide a maintenance bond as specified.

1.6 GUARANTEE

.1 This architectural woodworker shall furnish the owner with a two (2) year maintenance bond, to the full value of the architectural woodwork sub-contract. Millwork contractor is

to submit a letter from their insurer stating that they will provide the bond at the beginning of the project. The Guarantee shall cover replacing and/or refinishing to make good any defects in architectural woodwork due to faulty workmanship or defective materials supplied by this architectural woodworker, which appear during a two (2) year period following the date of substantial completion of the project.

1.7 INSPECTION

.1 Architectural woodwork shall be manufactured and/or installed to AWMAC Quality Standards and shall be subject to an inspection at the plant and site by an appointed inspector. Such inspection costs shall be paid from Cash Allowances. Shop drawings shall be submitted for review or approval before any work is commenced. Any work which does not meet the Consultant or Owner's Quality Standards shall be replaced by this architectural woodworker, at no additional cost to the owner and to the satisfaction of the consultant and the inspector.

1.8 DELIVERY, STORAGE, AND HANDLING

.1 Protect millwork against dampness and damage during and after delivery.

.2 Store millwork in ventilated areas, protected from extreme changes of temperature or humidity.

Part 2 Products

2.1 MATERIALS

.1 Softwood lumber: unless specified otherwise, S4S, moisture content 10 % or less for interior work in accordance with following standards:

.1 CAN/CSA-O141.

.2 NLGA Standard Grading Rules for Canadian Lumber.

.3 AWMAC premium grade, moisture content as specified.

.2 Hardwood lumber: moisture content 10% or less for interior work in accordance with following standards:

.1 National Hardwood Lumber Association (NHLA).

.2 AWMAC premium grade, moisture content as specified.

.3 Species: to be Maple unless otherwise noted.

.3 Hardwood plywood: to CSA O115, of thickness indicated, rotary cut face veneer, birch plywood, veneer core, No. 1 grade. Select veneers to provide book match veneer strips to be 240 mm wide minimum.

.1 Species: to be Birch, unless otherwise noted.

.4 Nails and staples: to CSA B111, galvanized for exterior work, interior high-humidity areas and for treated lumber; plain finish elsewhere. Use spiral thread nails except where specified elsewhere.

□

.5 Particle Board core: to CAN3-0188.1-M78, Grade R, 720 kg/m3 density in thicknesses indicated.

.6 Plywood core for shelving: to CSA 0120.

2.2 PLASTIC LAMINATE

.1 Refer to Section 06 47 00.

2.3 MELAMINE FACED PARTICLEBOARD

.1 To CAN3-0.188.1-M78, Grade "R" particleboard sanded faces, 13 mm, 16 mm, and 19 mm thickness, faced with laminated plastic. Melamine resin impregnated cover sheet with coloured and/or pattern paper inner layer. Thermally fuse to rigid particleboard substrate. Melamine faces shall be 8 mil thickness. Wood grain pattern to be chosen by Consultant from manufacturer's full range.

.1 Acceptable Material: Melamine faced particleboard as manufactured by Flakeboard, Formica or Arborite Division of Domtar Construction Materials Ltd., are of acceptable quality but colour/pattern requires approval prior to confirmation of full acceptance.

2.4 EDGE BANDING

.1 Solid polyvinyl chloride (PVC), 3 mm thickness x full width of panel edge, colour/pattern to match finished face of melamine panel or as selected by Consultant. All exposed edges of banding to be radiused to 2 mm radius after installation on panels. Submit sample of edge-banded panel with radiused edges to Consultant for approval prior to fabrication of architectural woodwork.

.1 Acceptable Material: Solid PVC edging as manufactured by "Woodtape" Edge-Banding.

.2 Acceptable Material: Solid PVC edging as manufactured by "Complast Inc."

.3 Provide solid hardwood edging, and plastic laminate edging where specified on AD drawings.

2.5 CABINET HARDWARE

.1 Furnish and install all hardware to custom casework as follows:

.1 Cupboard Doors - 19 mm thick.:

.1	Hinges	200 Series 110° Salice
.2	Roller Catches	807N 2G (SgDr) Onward
.3	Elbow Catches	T03222 C15 (DhDr)
.4	Door Pulls	CBH235-3 1/2" C32D
.5	Cupboard Locks	8703/8704 14a National

.2 Drawers - 19 mm thick.:

.1	Drawer Slides	"Accuride Slide" 3832-2G full extension with ball bearing rollers, 100lb. capacity
.2	Drawer Pulls	CBH235-3 1/2" C32D

□

.3 Drawer Locks 8703 - 14a National

.3 Shelving:

.1 Plaster strips KV255 Zinc Knape & Vogt

.2 Shelf Clips KV256 Zinc Knape & Vogt

.4 Teacher's Closet Doors - 35 mm thick.:

.1 Hinges F179 76x76 Stanley C15

.2 Roller Catches 504N Onward C26

.3 Surface bolt 043-4 X Angle Strike C15

.4 Teacher's Closet Locks supplied and installed under Section 08 71 10 & 08 71 15.

.5 Closet Rods and Flanges

.1 Rods: chrome finish, Ø 33 mm.

.2 Flanges: chrome finish, closed flanges at both ends of rods.

.6 Shelf and Rod Steel, white enamel, model No. 1797, manufactured by Hager.

.7 Display Case:

.1 Pilaster Strips: Brush Finish

.2 Shelf Brackets: Brush Finish

.3 Aluminum sliding track, top and bottom to accommodate sliding glass doors

.4 Lock sets and all required hardware for sliding glass door display system

.5 Glazing: 12mm tempered glass for shelves. 8mm tempered glass for sliding doors. Glazing to display cases to be provided by Section 08 80 50 and installed by the Section 06 40 00.

.8 Counter Brackets:

.1 Teacher's Workroom Counter & Computer Room Counter (750mm counter depth) Support Bracket
Model: Hafele Hebgo Bracket, model no. 287-44-489, 150 kg capacity per pair, grey powder coat, refer to AD 600 series.

.2 Library Workroom Counter (635mm counter depth) Support Bracket
Model: Hafele Hebgo Bracket, model no. 287-45-477, 150 kg capacity per pair, grey powder coat, refer to AD 600 series.

.3 Copier Workroom #110 Counter (400mm counter depth) Support Bracket
Model: Hafele Hebgo Bracket, model no. 287-44-443, 150 kg capacity per pair, grey powder coat, refer to AD 600 series.

.9 Library Book Cart: springs for bottom panel support: 4 springs – "Producto" AM19908C ½" bar

.10 Safety Release Coat Hook:

.1 High strength polycarbonate coat hook with safety release weight under downward pressure to not exceed 12 kg (26 lbs.)

.2 Supply all suitable mounting hardware for a vandal proof, secure installation using stainless steel sleeve bolts on partition doors or panels. Do not supply standard Robertson or Phillips head screws.

.3 Colours: 2 premium colours from manufacturer's complete range.

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.4 Acceptable Materials: "Henkel Hook" as manufactured/distributed by Henkel Diversified Inc, London ON, Tel. (519) 641-5872.

.5 Locations: to all Childcare and Kindergarten 'Cubbies'; two per unit as shown on AD 644. Hooks for these areas noted above are to be supplied by this section. All other areas, safety hooks are to be supplied by Section 10 11 25.

.6 Samples: submit test data and samples for review as specified in Section 013330 – Submittal Procedures.

.11 Bench Support Brackets:

.1 Bench support brackets to be Hafele Hebgo bracket. Model to be coordinated by millwork contractor based on size and load capacity of 150 kg per 600mm.

.12 Heavy Duty Lock Castors:

.1 Swivel Castors with brake, 2" x 2-1/2" (40kg): Part 00K21.21, as distributed by Lee Valley Tools, 1-800-267-8767, www.leevalley.com, or approved alternate.

.2 Quantity and Location as described on AD drawings.

.13 Grommet:

.1 Cable grommets: round, one-piece chrome polished '429.94.258' by Hafele or approved alternative.

.2 Quantity and Location as described on AD drawings.

.2 This section shall also include accessories such as rubber door silencers (2 per drawer or door), and other items necessary for the completion of the millwork.

.3 Cabinet Keying: Key all cabinet and drawer locks alike for the entire school, except teachers" closets.

2.6 MELAMINE CLAD CABINETWORK

.1 All cabinet frames whether for base, wall or tall floor standing cases, shall be fabricated so each is a self-contained module. Front side top and bottom, exterior and interior surfaces shall be finished allowing future relocation of any module, into any bench arrangement, without need of any additional finishing.

.2 Gables and panels shall be fabricated from 19 mm thick melamine surfaced panels with a P.V.C. edging applied to exposed edges.

.3 Bottoms shall be fabricated utilizing the same materials and edge finish as gables. Front edge will be edged with P.V.C. edging. All other edges will be thoroughly sealed and moisture proofed prior to attachment to gables.

.4 Rails shall be fabricated and machined to join the gables and form a rigid cabinet frame.

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.5 Tops (applies to wall and tall units only) shall be fabricated utilizing the same material and edge finish as gables. Front edge will be edged with P.V.C. edging.

.6 Toe kick rail shall have a 100 mm x 19 mm section, machined to receive four screw nails for attachment to bottom front edge of gables. Cabinet base shall be plywood attached to melamine cabinet separately, insuring the melamine particle core gables do not come in contact with the floor.

.7 Backs in base cupboards shall be fabricated from a 6 mm hardboard.

.8 Backs in wall and tall cabinets shall be fabricated from 13 mm thick melamine surfaced panels securely glued and screw nailed into the check out provided in the backs of gables, tops, and bottoms.

.9 Shelves shall be fabricated from 19 mm birch plywood with solid birch edge and lacquer finish. All shelves shall be adjustable at 13 mm increments and each will be supported by a shelf support resting in four pilaster strips attached to the gables.

.10 Doors shall be fabricated from 19 mm thick melamine surfaced panels. All four edges shall be P.V.C. edging.

.11 Drawer fronts shall be fabricated utilizing the same material and edge finish as doors. All four edges shall P.V.C. edging. Fronts will be secured to drawer bodies with five screw nails through the front of the drawer body into the core of the drawer front.

.12 Drawer bodies shall consist of box construction fabricated from 13 mm birch plywood with solid birch edge, front, sides and back with a 6 mm hardboard bottom dadoed and glued into box members. Joint front, sides and back with carefully fitted glued and tenoned joints. Alternately, Blum Metabox drawer body and side can be used.

.13 35 mm thick doors shall be solid core with plastic laminate both sides and on all four edges, color and grain to match melamine.

.14 Solid hardwood glazed door fronts and frames shall receive lacquer finish. Glazing shall be 3mm tempered clear glass.

.15 Finish:

.1 Melamine surfaced panels shall be finished both sides in the same colours, patterns, and grain as selected by the Consultant.

.2 Solid hardwood glazed doors and drawer bodies shall be sanded, then sealer coated, and sanded with two finish coats of catalytic type acid resistant varnish.

2.7 PLASTIC LAMINATE on PLYWOOD cabinetwork

Refer to AD drawings (binder C) for locations

.1 Plastic Laminate factory glued to plywood core, thickness as shown or specified.

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.2 Plastic laminate graphics to be book matched or run in same direction where applicable. All exposed finished casework, drawer, cupboard and door fronts shall have vertical grain orientation.

.3 Use solid hardwood for exposed edges, typical for Library/Learning Commons millwork.

.4 Case bodies: ¾" plywood, finish with plastic laminate factory adhered. Typical for gables and panels

.6 Backs: ¼" plywood, finished with plastic laminate. Backs in wall and tall cabinets shall be securely glued and screw nailed into the check out provided in the backs of gables, tops, and bottoms.

.7 Shelving: ¾" plywood, finish with plastic laminate factory adhered. All shelves shall be adjustable at 13mm increments and each will be supported by a shelf support resting in four pilaster strips attached to the gables.

.8 Drawers:

.1 ¾" plywood, finish with plastic laminate. All four edges shall have plastic laminate edging. Fronts will be secured to drawer bodies with five screw nails through the front of the drawer body into the core of the drawer front.

.2 Drawer box including front, back and sides shall consist of box construction, carefully fitted glued and tenoned joints.

.3 Drawer bottom to be ¼" plywood, plastic laminate finished, dadoed and glued into box members.

.9 Casework doors: ¾" plywood, plastic laminate finished with plastic laminate to all four sides. Locks to be provided as indicated on details.

.10 All cabinet frames whether for base, wall or tall floor standing cases, shall be fabricated so each is a self-contained module. Front side top and bottom, exterior and interior surfaces shall be finished allowing future relocation of any module, into any bench arrangement, without need of any additional finishing.

.11 Rails shall be fabricated and machined to join the gables and form a rigid cabinet frame.

.12 Tops (applied to wall and tall units only) shall be fabricated utilizing the same material and edge finish as gables.

.13 Toe kick rail (behind rubber or ceramic base, as applicable) shall have a 4" x 3/4" section, waterproof fir plywood, machined to receive four screw nails for attachment to bottom front edge of gables. Cabinet base shall be plywood attached to cabinet separately, insuring the plastic laminate plywood gables do not come in contact with the floor.

2.8 SHOP FABRICATION

.1 Shop install cabinet hardware.

.2 Provide cutouts for plumbing fixtures, inserts, appliances, outlet boxes and other fixtures.

.3 Shop assemble work for delivery to site in size easily handled and to insure passage through building openings.

2.9 BENCHES

.1 32 x 92 solid maple boards with 32 x 108 solid maple edges. Lengths, as indicated on Plans, secured to metal supports. Polyurethane finish, semigloss.

.2 Bench support brackets to be Hafele Hebgo bracket. Model to be coordinated by millwork contractor based on size and load capacity of 150 kg per 600mm.

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2.10 INTERIOR SIGNAGE PANELS (ISP)

.1 Noted 'ISP' on drawings.

.1 Plastic laminate on 16mm particle board.

.2 600mm wide by 2800mm high or 2200mm.

.3 Location: adjacent doors where indicated on floor plans.

.4 Solid white acrylic numbers to be applied to the millwork panels (refer to Signage specifications).

2.11 WOOD PANELLING

.1 25mm x 100mm quarter sawn solid white oak wood (select or better) vertical paneling. Clear satin urethane finish.

.2 Location: cladding around curved walls of 'Seminar 2' 120, and other locations noted on drawings.

2.12 PLASTIC LAMINATED TOPS

.1 Coordinate with Section 06 47 00.

.2 19 mm thick particle board core with post-forming grade plastic laminate finish bonded with resorginal formaldehyde resin glue to a particleboard core. All countertop front face to return vertically 35 mm ± . All front and backsplash edges to be rounded.

.3 Underside to receive a backing sheet, sanded one side and bonded same as surfacing material.

.4 Exposed edges to be finished with same material as used for the top.

.5 Drip grooves to be cut into underside of the top where exposed edges occur.

.6 Splash backs, curbs and curb shelves are to be of similar construction as the tops.

.7 Use acid resistant post-forming grade laminate, where indicated on drawings. Colour: black.

.8 At all wall termination, provide backsplash return.

2.13 MOULDING AND TRIMS

.1 Fabricate mouldings in maximum practical lengths to profile shown. Install with concealed fasteners.

.2 Note requirement for this Section to supply and install solid maple or birch wood trim with clear satin trim where noted on drawings or AD drawings in Binder C.

□

2.14 FABRICATION

.1 Set nails and countersink screws apply wood filler to indentations, sand smooth and leave ready to receive finish.

.2 Shop install cabinet hardware for doors, shelves and drawers. Recess shelf standards unless noted otherwise.

.3 Shelving to cabinetwork to be adjustable unless otherwise noted.

.4 Provide cut-outs for plumbing fixtures, inserts, appliances, outlet boxes and other fixtures.

.5 Shop assemble work for delivery to site in size easily handled and to ensure passage through building openings.

.6 Obtain governing dimensions before fabricating items which are to accommodate or abut appliances, equipment and other materials.

.7 Ensure adjacent parts of continuous laminate work match in colour and pattern.

.8 Form shaped profiles and bends as indicated, using postforming grade laminate to laminate manufacturer's instructions.

.9 Use straight self-edging laminate strip for flatwork to cover exposed edge of core material. Chamfer exposed edges uniformly at approximately 20 degrees. Do not mitre laminate edges.

.10 Apply laminate backing sheet to reverse side of core of plastic laminate work.

.11 Apply laminated plastic liner sheet where indicated.

2.15 SCIENCE CLASS UPPER CABINETS

.1 6 mm tempered Glazing to upper cabinet units in science classroom to be provided to Millworker by Section 08 80 50.

2.16 DISPLAY CASES

.1 Display Cases: Provide and install appropriate hinges, keyed locks and wood/glass shelf supports required for all display cases as described on drawings. Glazing to be provided by section 08 80 50. Refer to Section 08 80 50.

.2 Display/Trophy Case Finish:

.1 Linseed oil, Forbo Tackboard surfacing to interior of all display cabinets where felt or tackboard is indicated: supplied by Architectural School Products or equivalent product by other manufacturer approved by the Consultant. Colour to be selected by Architect.

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2.17 INSTALLATION

.1 Do architectural woodwork to Quality Standards of the Architectural Woodwork Manufacturers Association of Canada (AWMAC), except where specified otherwise.

.2 Install prefinished millwork at locations shown on drawings. Position accurately, level, plumb straight.

.3 Set and secure all material and components in place, rigid, plumb and square.

.4 Provide heavy duty fixture attachments for wall mounted cabinets.

.5 Use draw bolts in countertop joints.

.6 At junction of plastic laminate counter back splash and adjacent wall finish, apply small bead of sealant.

.7 Apply water resistant building paper over wood framing members in contract with masonry or cementitious construction.

.8 After installation, fit and adjust operating hardware for wood and laminated plastic cabinet doors, drawers and shelves.

2.18 CLEANING

.1 Clean millwork, cabinet work, drawers and outside surfaces.

.2 Remove excess glue from surfaces.

2.19 PROTECTION

.1 Protect millwork and cabinet work from damage until final inspection.

END OF SECTION

□

Part 1 General

1.1 RELATED SECTIONS

.1 Section 062000: Finish carpentry

.2 Section 064000:Architectural Woodwork

1.2 REFERENCES

.1 CAN/CGSB-71.20-M88 Adhesive, Contact, Brushable

.2 CAN3-A172-M79 High Pressure Paper Base, Decorative Laminates.

.3 CSA O112 Series-M1977(R2001) CSA Standards For Wood Adhesives.

.4 CSA O121-M1978(R2003) Douglas Fir Plywood.

.5 CSA O151-04 Canadian Softwood Plywood.

1.3 SAMPLES

.1 Submit duplicate samples of joints, edging, cutouts and postformed profiles in accordance with the General Conditions.

1.4 MAINTENCE DATA

.1 Provide maintenance data for laminated plastics work for incorporation into Operation and Maintenance Manual.

1.5 PRODUCT HANDLING

.1 Cover finished laminated plastic surfaces with heavy kraft paper or put in cartons during shipment. Protect installed laminated surfaces by approved means. Do not remove until immediately before final inspection.

.2 Do not store or install materials in areas where relative humidity is less than 25% or greater than 60% at 22 deg C.

Part 2 Products

2.1 GENERAL

.1 Products manufactured by one of the following companies are suggested for use on this project.

.1 Cyanamid Canada Inc., Montreal (Formica).

.2 Domtar Construction Materials, Arborite Division, LaSalle Quebec (Arborite).

.3 Wilsonart International, Temple, Texas (Wilsonart).
.4 Nevamar Corporation, Odenton Md.

.2 Allow for 6 colours of matte finish from manufacturer's full range. Final Selection of Plastic Laminate surface characteristics including colour, texture and pattern is to be made by the Consultant by means of a Colour Schedule to be issued at a later date. Use the following materials specifications as a base bid:

2.2 MATERIALS

.1 Notwithstanding laminates specified below, for laminate surfaces and backing sheets in Foyer No. 102 use only Fire retardant materials as follows:

.1 Formica Grade 32 Fire-Rated Vertical Grade (VGF, Nominal Thickness .032" (0.8mm), matte finish for vertical applications

.2 Grade 50 Fire-Rated General Purpose Grade (HGF, Nominal Thickness .048" (1.2mm), matte finish for horizontal applications

.3 Grade 87 Fire Rated Backing Sheet Grade (BLF, Nominal Thickness .028" (0.7mm)) on the back surfaces of laminate faced plywood.

.2 Notwithstanding laminates specified below, for laminate to Science Room countertops use Acid Resistant laminate; Colour: Black.

.3 Laminated plastic for flatwork: to CAN3-A172, Grade GP, Type SD, 1.25mm (0.050") thick; based on solid colour range with velour finish. Acceptable products:

.1 Formica Laminate Grade 10.

.2 Nevamar H-5 General Purpose Grade.

.3 Wilsonart General Purpose HGS Type 107.

.4 Laminated plastic for postforming work: to CAN3-A172, Grade PF, Type S, 1.07mm (0.042") thick, based on solid colour range with velour finish. Acceptable products:

.1 Formica Laminate Grade 12.

.2 Nevamar HF-5 Horizontal Post Forming Grade.

.3 Wilsonart Postforming Type 350.

.5 Laminated plastic backing sheet: supplied by same manufacturer as facing sheet; not less than 0.508 mm (0.02") thick and same colour as face laminate. Sanded one side. Acceptable products:

.1 Formica Laminate Grade 20.

.6 Laminated plastic cabinet liner sheet material or for MCP Board or Cladboard material: supplied by same manufacturer as facing sheet, not less than 0.760 mm (0.028") thick, white colour. Acceptable products:

.1 Formica Laminate Grade 20.

.2 VF-3 Vertical Post Forming Grade by Nevamar.

.3 Wilsonart Vertical Surface Type 335.

.7 Plywood core: Douglas Fir Plywood to CSA-O121 or Canadian Softwood Plywood to CSA-O151 solid two sides, 19 mm (¾") thick.

.8 Particleboard core: to CAN3-O188.1, Grade R, sanded faces, of thickness indicated.

.9 Adhesive for laminated plastic: to be CSA approved and one of the following types as selected by the laminate manufacturer as being suitable for the application:

.1 Urea resin adhesive to CSA O112 Series.

.2 Contact adhesive to CAN/CGSB-71.20.

.3 Resorcinol resin adhesive to CSA O112.

.4 Polyvinyl adhesive to CSA O112.

.5 Two component epoxy thermosetting adhesive.

.10 Sealer: water resistant sealer or glue acceptable to laminate manufacturer.

.11 Sealant: of a type recommended by the laminate manufacturer and in accordance with Section 079210 - Joint Sealers; colour to be selected by the Consultant.

.12 Draw bolts and splines: as recommended by fabricator.

.13 Apply laminate backing sheet to reverse side of core of plastic laminate work.

.14 Apply laminated plastic liner sheet to interior of cabinetry, including all exposed surfaces such as gable ends, doors and drawers, and where otherwise indicated.

Part 3 Execution

3.1 INSTALLATION

.1 Install work plumb, true and square, neatly scribed to adjoining surfaces.

.2 Make allowances around perimeter where fixed objects pass through or project into laminated plastic work to permit normal movement without restriction.

.3 Use draw bolts and splines in countertop joints. Maximum spacing 450 mm (18") oc, 75 mm (3") from edge. Make flush hairline joints.

.4 Provide cutouts for inserts, grilles, appliances, outlet boxes and other penetrations. Round internal corners, chamfer edges and seal exposed core.

.5 At junction of laminated plastic counter back splash and adjacent wall finish, apply small bead of sealant.

.6 Where laminated plastic is site applied, adhere laminated plastic over entire surface. Make corners with hairline joints. Use full sized laminate sheets. Make joints only where indicated or approved. Slightly bevel arises. Cap exposed edges with anodized aluminum extrusions.

.7 For site application, offset joints in plastic laminate facing from joints in core.

END OF SECTION

Part 1 General

1.1 SECTION INCLUDES

.1 Materials and installation for asphalt for use as waterproofing.

1.2 RELATED SECTIONS

.1 Section 01 33 00 - Submittal Procedures.

.2 Section 01 51 00 - Temporary Utilities.

.3 Section 312310- Excavating, Trenching and Backfilling

.4 Section 033000- Cast- in-Place Concrete

.5 Section 042113- Masonry

1.3 REFERENCES

.1 Canadian General Standards Board (CGSB)

- .1 CAN/CGSB-37.2-[M88], Emulsified Asphalt, Mineral-Colloid Type, Unfilled, for Dampproofing and Waterproofing and for Roof Coatings.
- .2 CAN/CGSB 37.3-[M89], Application of Emulsified Asphalts for Dampproofing or Waterproofing.
- .3 CAN/CGSB 37.5-[M89], Cutback Asphalt Plastic Cement.
- .4 CGSB 37-GP-6Ma-[83], Asphalt, Cutback, Unfilled, for Dampproofing.
- .5 CGSB 37-GP-9Ma-[83], Primer, Asphalt, Unfilled, for Asphalt Roofing, Dampproofing and Waterproofing.
- .6 CGSB 37-GP-11M-[76(R1984)], Application of Cutback Asphalt Plastic Cement.
- .7 CGSB 37-GP-12Ma-[84], Application of Unfilled Cutback Asphalt for Dampproofing.
- .8 CGSB 37-GP-15M-[76(R1984)], Application of Asphalt Primer for Asphalt Roofing, Dampproofing and Waterproofing.
- .9 CAN/CGSB 37.16-[M89], Filled, Cutback, Asphalt for Dampproofing and Waterproofing.
- .10 CAN/CGSB 37.28-[M89], Reinforced Mineral Colloid Type, Emulsified Asphalt for Roof Coatings and for Waterproofing.
- .11 CGSB 37-GP-36M-[76], Application of Filled Cutback Asphalts for Dampproofing and Waterproofing.
- .12 CGSB 37-GP-37M-[77], Application of Hot Asphalt for Dampproofing or Waterproofing.

.2 Canadian Standards Association (CSA International)

.1 CSA A123.4-[98], Bitumen for Use in Construction of Built-Up Roof Coverings and Dampproofing and Waterproofing Systems.

.3 Health Canada

.1 Workplace Hazardous Materials Information System (WHMIS)

.1 Material Safety Data Sheets (MSDS).

.4 National Research Council Canada (NRC)/Institute for Research in Construction (IRC)

.1 Canadian Construction Materials Centre (CCMC)

1.4 PRODUCT DATA

.1 Submit product data in accordance with Section 01 33 00 - Submittal Procedures .

.2 Submit product data sheets for bituminous dampproofing products. Including:

.1 Product characteristics.
.2 Performance criteria.
.3 Application methods.
.4 Limitations.

.3 Manufacturer's Instructions: Provide to indicate special handling criteria, installation sequence, and cleaning procedures.

1.5 DELIVERY, STORAGE AND HANDLING

.1 Provide and maintain dry, off-ground weatherproof storage.

.2 Store materials on supports to prevent deformation.

.3 Remove only in quantities required for same day use.

.4 Store materials in accordance with manufacturer's written instructions.

.5 Store solvent base liquids away from excessive heat and open flame.

.6 Store emulsion liquids at above freezing temperatures, free from contact with cold or frozen surfaces.

1.6 WASTE MANAGEMENT AND DISPOSAL

.1 Remove from site and dispose of packaging materials at appropriate recycling facilities.

.2 Ensure emptied containers are sealed and stored safely.

.3 Fold up metal banding, flatten and place in designated area for recycling.

.4 Divert unused bituminous waterproofing, sealing compounds and asphalt primer materials from landfill to recycling facility approved by Consultant.

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1.7 PROJECT/SITE ENVIRONMENTAL REQUIREMENTS

.1 Temperature, relative humidity, moisture content.

.1 Apply waterproofing materials only when surfaces and ambient temperatures are within manufacturers' prescribed limits.

.2 Do not proceed with Work when wind chill effect would tend to set bitumen before proper curing takes place.

.3 Maintain air temperature and substrate temperature at dampproofing installation area above 5 degrees C for 24 hours before, during and 24 hours after installation.

.4 Do not apply dampproofing in wet weather.

.2 Safety: Comply with requirements of Workplace Hazardous Materials Information System (WHMIS) regarding use, handling, storage, and disposal of asphalt, sealing compounds, primers and caulking materials.

.3 Ventilation:

.1 Ventilate area of Work as directed by Consultant by use of approved portable supply and exhaust fans.

.2 Ventilate enclosed spaces in accordance with Section 01 51 00 - Temporary Utilities.

.3 Provide continuous ventilation during and after waterproofing application. Run ventilation system 24 hours per day during installation; provide continuous ventilation for 7 days after completion of waterproofing installation.

1.8 QUALIFICATIONS AND QUALITY ASSURANCE

.1 Waterproofing shall be carried out by applicators skilled and with previous similar experience in this work in strict accordance with manufacturer's printed instructions. Submit proof of experience upon Consultant’s request.

.2 Manufacturer’s representative shall be called by the applicator to inspect the substrate prior to commencement of work.

.3 Manufacturer’s representative shall be retained by installer to provide technical assistance on a as-needed basis during course of installation of membrane.

1.9 EXTENDED WARRANTY

.1 Contractor performing the work of this Section, shall provide a full materials and labour warranty for 5 years from the date of Substantial Performance of the Contract.

.2 Contractor hereby warrants that the waterproofing membrane will stay in place and remain leakproof in accordance with the Contract, but for 5 years.

.3 Waterproofing membrane manufacturer shall provide a written warranty that the waterproofing membrane will remain in a watertight condition and will not leak as a result of faulty materials for a period of ten years.

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Part 2 Products

2.1 MATERIALS

.1 Locations: Walls below grade in elevator pits and all foundations adjacent to sodded and planted areas.

.2 Primary Waterproofing Membrane for Vertical Foundation Walls: Cold applied elastomeric asphalt emulsion waterproofing membrane in compliance with CGSB 37.2 shall be Aqua-Bloc 720-38 Elastomeric Asphalt Emulsion Waterproofing Membrane as manufactured by Bakor, a one component waterproofing compound compatible with sheet waterproofing membranes and substrates, having the following characteristics:

.1 Elongation: 2000%,

.2 Maximum VOC: 10 g/l

.3 Water vapour permeance: 10 ng/Pa.m².s, ASTM E96,

.4 Chemical resistance: Alkalis, calcium chloride, mild acid and salt solutions.

.3 Fabric Reinforcement for Cold Applied Waterproofing: Fabric reinforcement shall be 990-06 Yellow Jacket as supplied by Bakor, a glass reinforcement sheet capable of allowing the membrane to bleed through adequately to provide a monolithic reinforced membrane system.

.4 Prefabricated Drainage Board for Vertical Surfaces: Bakor DB 2000 Prefabricated Composite Drain Board, a polypropylene core board with polypropylene fabric attached, having the following physical properties:

.1 Flow Rate: 223 L/min/m,

.2 Compressive Strength: 11,000 psf,

.3 Thickness: 10 mm

.5 Prefabricated Drainage Board Accessories

.1 Securement Bars: Continuous 6mm x 20mm (1/4" x 3/4") HDPE bar for screw attachment.

.2 Moulding Strip: Continuous 90mm wide "Z" flashing strip to fit over exposed top edge of drain board.

.3 Drain Board Plugs & Nails: HDPE pre-moulded washer to fit dimples c/w high strength, corrosion resistant concrete nails, UCAN AFH 37 or equal.

.4 Termination Sealant: Polybitume 570-05 Polymer Modified Sealing Compound as manufactured by Bakor, a polymer modified sealing compound, compatible with sheet waterproofing membrane, substrate and insulation materials, complies with CGSB 37.29, remains flexible with ageing and chemically resistant to alkalis, calcium chloride, mild acid and salt solutions.

.5 Approved alternate: Meeting the above specifications as manufactured by Tremco Inc., W.R. Meadows or Carlisle Coatings and Waterproofing.

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Part 3 Execution

3.1 WORKMANSHIP

.1 Keep hot asphalt:

.1 Below its flash point.

.2 At or below its final blowing temperature.

.3 Within its equiviscous temperature range at place of application.

3.2 PREPARATION

.1 Before applying waterproofing:

.1 Seal exterior joints between foundation walls and footings, joints between concrete floor slab and foundation and around penetrations through waterproofing with sealing compound.

.2 Before commencing work, ensure environmental and site conditions are suitable for installation of waterproofing membrane.

.3 The substrate shall be clean and dry, free from surface water, ice, snow or frost, dust, dirt, oil, grease, curing compounds or any other foreign matter detrimental to the adhesion of the waterproofing membrane.

.4 Can be applied to damp or new green concrete. Ensure concrete is smooth and free from voids and honeycombing prior to application of waterproofing membrane.

.5 Voids, cracks, holes and other damages to horizontal or vertical surfaces shall be repaired before application of the membrane.

.6 Notify Consultant and Contractor in writing of unsuitable surfaces and working conditions. Commencement of work shall imply acceptance of surfaces and working conditions.

3.3 MOCK UP

.1 Construct a 3 m x 2 m mock-up area for each separate job condition for inspection by the Consultant prior to proceeding with the work. Mock-up may be part of finished work.

.2 Notify Consultant and allow 24 hours for inspection by Consultant.

3.4 DECK TO VERTICAL JUNCTURES, FOOTINGS/FOUNDATION WALLS, CRACKS IN SLABS AND PROTRUSIONS

.1 Coat penetrations, such as brackets, clips, braces, etc. that are set into the concrete with a 2.3 mm (90 mil) coating of primary waterproofing membrane to the height of the wearing course and around projections to ensure a complete seal prior to coating the entire area.

.2 Penetrations subject to movement should be flashed with fabric reinforcement set into a minimum thickness of 2.3 mm (90 mil) of primary waterproofing membrane to required height on the wall and at least 100 mm (4”) on the slab, embed fabric reinforcement into wet coating followed by second coat.

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.3 To all cracks and cold joints less than 3 mm (1/8") apply a coat of primary waterproofing membrane at a minimum thickness of 2.3 mm (90 mil) and reinforce with fabric reinforcement.

.4 To all cracks greater than 3 mm (1/8"), prime area and install self-adhered flashing membrane. Overlap end joint of sheet a minimum 75 mm (3").

.5 At monolithic wall/slab junctures, apply primary waterproofing membrane at a minimum thickness of 2.3 mm (90 mil) to required height on the wall and at least 100 mm (4") on the slab and embed fabric reinforcement into wet primary waterproofing membrane followed by a second coat.

.6 At non-monolithic wall/slab junctures, prime area, trowel-in fillet bead to inside corners and install self-adhered flashing membrane sheet to the required height on the wall and at least 100 mm (4") on the slab. Lap primary waterproofing membrane over a minimum of 50 mm (2").

.7 At footing to foundation wall junctions apply a coat of primary waterproofing membrane at a minimum thickness of 2.3 mm (90 mil) and reinforce with fabric reinforcement followed by second coat.

3.5 WATERPROOFING MEMBRANE VERTICAL APPLICATION

.1 Apply a full and continuous coat of primary waterproofing membrane at approximately 1.5 l/m^2 (3.6 gal. US/100ft^2) and embed fabric reinforcement into coating ensuring no fishmouths or wrinkles are created and allow to set.

.2 Apply second full and continuous coat of primary waterproofing membrane at 1.5 l/m^2 (3.6 gal./100$ft.^2$) and allow to cure.

3.6 WATERPROOFING MEMBRANE HORIZONTAL APPLICATION

.1 Apply a full and continuous coat of primary waterproofing membrane at approximately 1.5 l/m^2 (3.6 gal. US/100ft^2) and embed fabric reinforcement into coating ensuring no fishmouths or wrinkles are created and allow to set.

.2 Apply second full and continuous coat of primary waterproofing membrane at 1.5 l/m^2 (3.6 gal./100$ft.^2$) and allow to cure.

3.7 INSTALLATION OF PROTECTION BOARDS

.1 Protection Boards shall be installed over the waterproofing membrane to prevent damage from materials used in backfilling.

.2 Allow waterproofing to cure dry and apply protection board adhesive in 12mm wide strips spaced at 450 mm o/c to cure waterproofing membrane. Immediately embed protection board and press into adhesive to ensure full contact.

.3 Do not backfill until adhesive has cure dried. Do not use excessive levels of adhesive.

□

3.8 APPLICATION OF DRAINAGE BOARD VERTICAL

.1 Align and hang drainage up to foundation wall. Position bottom edge of drainage board to be in moderate contact with weeping tile system.

.2 Secure drainage board to foundation wall with nails and washers spaced 450 mm o/c horizontally. Install minimum of 2 rows staggered and spaced 150 mm apart and min 150 from top edge.

.3 Align and install termination strip along top edge with nails spaced 300 mm o/c and seal with termination sealant.

.4 Align and install moulding strip over completed top edge detail.

.5 Overlap end laps, pull back loose fabric to expose drain core and position core of second panel over the overlap flange of first panel.

.6 Bend drain board to create inside corners and cut board to create outside corners, provide 75 mm of extra fabric to wrap corner.

.7 Stagger or offset joints of drain board sheets.

.8 Place all subsequent sheets in an overlapping single fashion.

.9 Backfill bottom edge in conjunction with weeping tile system.

3.9 APPLICATION

.1 Do sealing work in accordance with CGSB 37-GP-11M except where specified otherwise.

.2 Do priming of surface in accordance with CGSB 37-GP-15M except where specified otherwise.

.3 Apply primer.

3.10 SCHEDULE

.1 Apply continuous, uniform coating to entire exterior faces of foundation walls where described in item 2.1.1. of this specification section.

.2 Apply continuous, uniform coating to exterior side of foundation walls enclosing rooms below finished grade. Include exterior portion of interior walls where floors in adjacent rooms are at different elevations.

.3 Apply two additional coats of dampproofing to vertical corners and construction joints for a minimum width of 230 mm on each side, and all around and for 230 mm along pipes passing through walls.

□

3.11 CLEANING

.1 Promptly as the work proceeds and on completion clean up and remove from site all rubbish and surplus materials resulting from the foregoing work.

END OF SECTION

□

Part 1 General

1.1 RELATED SECTIONS

.1 Section 01 33 00 – Submittal Procedures.

.2 Section 04 21 13 – Masonry.

.3 Section 07 27 10 – Air Barriers.

.4 Section 07 55 00 – Roof insulation.

.5 Section 07 21 19 – Spray in Place Urethane Foam Insulation.

1.2 REFERENCES

.1 American Society for Testing and Materials International, (ASTM).

.1 ASTM E96-[00e1], Test Methods for Water Vapour Transmission of Materials.

.2 Canadian General Standards Board (CGSB).

.1 CGSB 71-GP-24M-[77(R1983)], Adhesive, Flexible, for Bonding Cellular polystyrene Insulation.

.3 Underwriters Laboratories of Canada (ULC).

.1 CAN/ULC-S604-[91], Type A Chimneys.

.2 CAN/ULC-S701-[01], Thermal Insulation, Polystrene, Boards and Pipe Coverings.

.4 Environmental Choice Program (EPC).

.1 CCD-016-[97], Thermal Insulation.

1.3 SUBMITTALS

.1 Product Data:

.1 Submit manufacturer's printed product literature, specifications and data sheet in accordance with Section 01 33 00 - Submittal Procedures.

.2 Submit two copies of WHMIS MSDS - Material Safety Data Sheets in accordance with Section 01 33 00 - Submittal Procedures. Indicate VOC's insulation products and adhesives.

.2 Manufacturer's Instructions:

.1 Submit manufacturer's installation instructions.

1.4 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.

1.5 WASTE MANAGEMENT AND DISPOSAL

.1 Remove from site and dispose of packaging materials at appropriate recycling facilities.

.2 Collect and separate for disposal paper, plastic, polystyrene, corrugated cardboard, packaging material [n appropriate on-site bins for recycling.

Part 2 Products

2.1 INSULATION

.1 Extruded polystyrene (XPS): to CAN/ULC-S701.

.1 RSI 2.175/R12.5.

.2 Thickness: **100 mm** or as indicated on drawings.

.3 Edges: ship-lapped.

.4 For use at typical cavity wall construction and at miscellaneous detail locations calling for rigid insulation..

.5 Acceptable Material: "**Styrofoam Cavity-Mate**" as manufactured by Dow Chemical Canada Inc.

.6 Acceptable Material: "**Foamular C200**" as manufactured by Celfortec Inc. (Owen Corning).

.7 or approved equal.

.2 Extruded polystyrene (XPS): to CAN/ULC-S701.

.1 RSI 2.65/R 15.

.2 Thickness: **75 mm** or as indicated on drawings.

.3 Edges: Ship lapped.

.4 For use on wall construction below through-wall flashing, below slab on grade as shown typical foundation details,

.5 Acceptable Material: "**Styrofoam SM**" as manufactured by Dow Chemical Canada Inc.

.6 Acceptable Material: "**Foamular C300**" as manufactured by Celfortec Inc. (Owen Corning).

2.2 ADHESIVE

.1 Adhesive (for polystyrene): to CGSB 71-GP-24.

.1 Bakor Air Bloc 21.

.2 Compatible with respective rigid insulation, air/vapour and waterproofing membranes and recommended by manufacturers of those products. Use Bakor 230-21 rigid insulation adhesive for rigid insulation in contact with Blueskin air vapour barrier.

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 WORKMANSHIP

.1 Install insulation after building substrate materials are dry.

.2 Install insulation to maintain continuity of thermal protection to building elements and spaces.

.3 Fit insulation tight around electrical boxes, plumbing and heating pipes and ducts, around exterior doors and windows and other protrusions.

.4 Keep insulation minimum 75 mm from heat emitting devices such as recessed light fixtures, and minimum 50 mm from sidewalls of CAN4-S604 type A chimneys and CAN/CGA-B149.1 and CAN/CGA-B149.2 [type B] [and] [L] vents.

.5 Cut and trim insulation neatly to fit spaces. Butt joints tightly, offset vertical joints. Use only insulation boards free from chipped or broken edges. Use largest possible dimensions to reduce number of joints.

.6 Offset both vertical and horizontal joints in multiple layer applications.

.7 Do not enclose insulation until it has been inspected and approved by Consultant.

3.3 EXAMINATION

.1 Examine substrates and immediately inform Consultant in writing of defects.

.2 Prior to commencement of work ensure:

.1 Substrates are firm, straight, smooth, dry, free of snow, ice or frost, and clean of dust and debris.

3.4 RIGID PERIMETER FOUNDATION INSULATION INSTALLATION

.1 Apply adhesive to polystyrene in accordance with manufacturer's recommendations.

.2 Apply adhesive to insulation board by spot method with daubs 40 mm diameter x 25 mm high at 200 mm o.c. each way

.3 Interior application: extend boards vertically below bottom of finish floor slab as indicated on drawings, installed on inside face of perimeter foundation walls.

.4 Exterior application: extend boards below finish grade as indicated on drawings. Install on exterior face of perimeter foundation wall with adhesive.

.5 Under slab application: extend boards as indicated on drawings. Lay boards on level compacted fill.

3.5 RIGID CAVITY WALL INSULATION INSTALLATION

.1 System Comprised of:

.1 Specified thickness of rigid ship-lapped insulation on Henry-Bakor Blueskin SA air/vapour barrier.

.2 Henry-Bakor Airbloc 21 adhesive to be applied to all sides of insulation and continuous layer to all insulation surfaces in contact with air/vapour barrier. Butter all sides and back to ensure full air barrier integrity. Apply adhesive to polystyrene in accordance with manufacturer's recommendations

.3 Butter Air Bloc 21 at all brick tie penetrations to ensure a complete seal

.4 Install plastic LOC-Wedges at masonry veneer ties to ensure securement to structural wythe or back up wall and in full contact with air/vapour barrier on wall surfaces.

3.6 CLEANING

.1 Upon completion of installation, remove surplus materials, rubbish, tools and equipment barriers.

END OF SECTION

Part 1 General

1.1 RELATED SECTIONS

.1 Section 04 21 13 - Masonry.

.2 Section 01 45 00 - Quality Control.

.3 Section 01 51 00 - Temporary Utilities.

.4 Section 07 21 13 – Board Insulation.

.5 Section 07 55 00 – Protected Membrane Roofing.

.6 Section 07 62 00 – Sheet Metal Flashing & Trim.

.7 Section 07 27 10 – Air Barriers.

1.2 APPROVED ALTERNATE

.1 In relation to Cavity Wall Insulation only, this spray foamed-in-place insulation may be used as an approved alternate. Note that base cavity wall insulation is rigid board as specified in Section 07 21 13 and shown on drawings

1.3 REFERENCES

.1 Canadian Urethane Foam Contractors' Association Inc. (CUFCA)

.2 Underwriters' Laboratories of Canada (ULC)

.1 CAN/ULC-S101-[1989], Fire Endurance Tests of Building Construction and Materials.

.2 CAN/ULC-S102-[1988(R2000)], Surface Burning Characteristics of Building Materials and Assemblies.

.3 CAN/ULC-S705.1-[01], Standard for Thermal Insulation Spray Applied Rigid Foam, Medium Density, Material Specification.

.4 CAN/ULC-S705.2-[02], Standard for Thermal Insulation Spray Applied Rigid Foam, Medium Density, Installer's Responsibilities-Specification.

1.4 TEST REPORTS

.1 Submit test reports, verifying qualities of insulation meet or exceed requirements of this specification, in accordance with Section 01 45 00 - Quality Control.

.2 Submit test reports in accordance with CAN/ULC-S101 for fire endurance and CAN/ULC-S102 for surface burning characteristics.

1.5 QUALITY ASSURANCE

.1 Applicators to conform to CUFCA Quality Assurance Program.

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1.6 SAFETY REQUIREMENTS

.1 Protect workers as recommended by CAN/ULC-S705.2 and manufacturer's recommendations:

.1 Workers must wear [gloves] [respirators] [dust masks] [long sleeved clothing] [eye protection] [protective clothing] when applying foam insulation.

.2 Workers must not eat, drink or smoke while applying foam insulation.

1.7 PROTECTION

.1 Ventilate area in accordance with Section 01 51 00 - Temporary Utilities.

.2 Ventilate area to receive insulation by introducing fresh air and exhausting air continuously during and [24] hour after application to maintain non-toxic, unpolluted, safe working conditions.

.3 Provide temporary enclosures to prevent spray and noxious vapours from contaminating air beyond application area.

.4 Protect adjacent surfaces and equipment from damage by overspray, fall-out, and dusting of insulation materials.

1.8 WASTE MANAGEMENT AND DISPOSAL

.1 Remove from site and dispose of all packaging materials at appropriate recycling facilities.

.2 Collect and separate for disposal paper, plastic, polystyrene, corrugated cardboard packaging material in appropriate on-site bins for recycling.

.3 Fold up metal banding, flatten and place in designated area for recycling.

.4 Dispose of waste foam daily in location designated by Consultant and decontaminate empty drums in accordance with foam manufacturer's instructions and CAN/ULC-S705.2.

.5 Divert metal drums from landfill to metal recycling facility as approved by Consultant and to CAN/ULC-S705.2.

1.9 ENVIRONMENTAL REQUIREMENTS

.1 Apply insulation only when surfaces and ambient temperatures are within manufacturers' prescribed limits.

Part 2 Products

2.1 MATERIALS

.1 Insulation: spray polyurethane to CAN/ULC-S705.1.

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.1 Blowing agents must have a GWP of 150 or lower per Environment Canada Regulations effective January 2, 2021.

.2 Density: 30.4 kg/m3 (1.9 lb/ft3) minimum.

.3 Compressive Strength: >185 KPa (per ASTM D1622)

.4 Tensile Strength: > 330 KPa (per ASTM D1623)

.5 Air Barrier Classification:

.1 Type III (NRC) - permeance: 0.02 L/sec/m2 maximum at 75 Pa pressure differential.

.2 Air Barrier System Performance with leakage not exceeding 0.0054 l/m^2 @75 Pa pressure when tested in Accordance with CCMC Air Barrier System Requirements.

.3 All manufacturers/applicators shall submit test data reports prior to acceptance.

.6 Water Permeance: 125 ng/Pa.m2.s @25mm specimen thickness

.7 Submit manufacturer's Material Data Safety Sheets in accordance with and Sections 013300 – Submittal Procedures and 013530 – Health and Safety.

.8 Thickness: as required for thermal resistance indicated, or to match rigid board insulation thickness.

.9 Acceptable materials: Products meeting these specifications, including Walltite CMO1 by BASF Canada Inc., Heatlok Soya, Polarfoam Soya, Elastochem Insulathane Extreme and Genyk Boreal Nature Elite or equivalent product meeting or exceeding these specifications by Accella Polyurethane Systems or others.

.10 Installation shall only be by applicators specifically approved by the manufacturer/distributor.

.11 Acceptable materials: other manufacturers meeting or exceeding these specifications as approved in writing by the Architect following specification, WMIS and test data submission.

.2 Primers: in accordance with manufacturer's recommendations for surface conditions.

.3 Sheet Air/Vapour Barrier Transition Membrane and Thru-Wall Flashing:

.1 Self adhering SBS modified bitumen membrane reinforced with non-woven fibrous glass:

.1 Thickness: minimum 1.45 mm

.2 Water Vapour Permeance: 0.05 perms max value. (2.8 ng/Pa.m2.s)

.3 Air Permeance: less than 0.01 l/m2 at 75 Pa pressure differentials.

.4 Adhesion: 7 day min. Peel adhesion at 5 deg. C :

.1 to primed Concrete: > 20 N/cm

.2 to selfedge: > 20 N/cm

.3 to primed plywood: > 25 N/cm

.4 to metal: > 30 N/cm

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.5 Submit manufacturer's Material Data Safety Sheets in accordance with and Sections 01333 – Submittal Procedures and 013520 – Health and Safety.

.6 Acceptable Material: Blueskin SA by Bakor and Blueskin TW as thru-wall transition at masonry locations.

.2 Overlap typically minimum 150 mm on all adjacent layers/materials or as detailed.

Part 3 Execution

3.1 APPLICATION

.1 Apply insulation to clean surfaces in accordance with CAN/ULC-S705.2 and manufacturer's printed instructions. Use primer where recommended by manufacturer.

.2 Apply sprayed foam insulation in thickness as indicated.

3.2 WORKMANSHIP

.1 Certification

.1 Installation is to be only by certified CUFCA/NECA applicators and manufacturer of the product being applied. Applicator shall provide proof of both approvals.

.2 Examination

.1 Install insulation after building substrata materials are dry, thoroughly clean and capable of providing a firm, uniform bonding surface and temperatures are within the range recommended by product manufacturers.

.2 Verify that surfaces and conditions are suitable to accept work required in this section.

.3 Report, in writing, defects in surfaces or conditions which may adversely affect the performance of products installed under this section to the Consultant; prior to commencement of work.

.4 Do not commence work until defects have been corrected.

.3 Preparation-Sprayed Insulation:

.1 Mask and cover adjacent areas to protect from overspray.

.2 Apply primers for special conditions as required by foam manufacturer.

.3 Clean work area prior to commencing spray operations.

.4 Preparation-Peel & Stick Membrane:

.1 Prime all surfaces using Blueskin Primer by Bakor or primer specifically approved by membrane manufacturer. Allow primer to dry. Apply primer only to areas to receive membrane within the same working day, or reprime surfaces.

.5 Application-Sprayed Insulation:

.1 Apply insulation to clean surfaces in accordance with CAN/CGSB 51-39-92 and manufacturer's printed instructions. Use primer where recommended by manufacturer. Ensure full adhesion to transition membrane.

.2 Completely fill jambs of all hollow metal frames with insulation and ensure continuous contact with sheet membrane used at head of frames.

.6 Application-Peel & Stick membrane:

.1 Ensure membrane widths capable of sealing to all door opens at heads of frames.

.2 Lap sides and ends a minimum of 100 mm or as per details. Ensure full adhesion as per details.

.3 Position membrane for alignment with release film in place. Roll back, remove release film and press firmly in place. Roll all areas and laps with a steel or polyurethane roller.

.4 Seal ends of membrane to substrate using Polybithume by Bakor. or product approved specifically by membrane manufacturer.

.7 Tolerance

.1 Maximum variation from required thickness for sprayed insulation: 6 mm.

.8 Firestopping

.1 Required in all cavity walls 25 mm air space or greater.

.2 Install firestopping at 20 m intervals maximum horizontally and 3 m maximum vertically, in accordance with OBC requirements and manufacturer’s approved method of Roxul AFB and transition membrane protection.

.3 At wall extending more than 1 storey in height, install additional firestopping horizontally at intermediate floor elevation.

3.3 LOCATIONS

.1 Cavity Walls Above Grade: as an approved alternate to Rigid Cavity Installation.

.2 If used as alternate to rigid board insulation in wall cavity, provide mineral wool horizontal and vertical fire stopping to perimeter of building cavity as required by OBC Division B.

.3 If used as alternate to rigid board insulation in wall cavity, provide 450mm high band of rigid board insulation at the base of the wall cavity below the foamed in place insulation, to avoid sag and blocking of weep holes.

.4 On all structural steel in concealed locations exterior to insulation wall assemblies where steel penetrates through thermal barrier of wall forming a “cold bridge, whether shown on drawings or not.

.5 Concealed within Soffit Conditions: Refer to drawings.

.6 Jambs of Hollow Metal Frames: Refer to Section 081115 – Door Schedule.

.7 Behind Metal Siding/composite panels: Refer to Section 074143 – Aluminum Composite Panels.

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.8 All other miscellaneous locations to ensure integrity of a continuous air/vapour barrier and insulation layer.

END OF SECTION

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Part 1 General

1.1 SECTION INCLUDES

.1 Materials and installation methods providing [primary] airvapour barrier materials and assemblies.

.2 Air/vapour barrier materials to provide continuous seal between components of building envelope and building penetrations.

1.2 RELATED SECTIONS

.1 Section 04 21 13 - Masonry.

.2 Section 07 51 12 – Built-Up Bituminous (BUR) Roofing.

.3 Section 07 46 13 – Preformed Metal Cladding Siding.

.4 Section 07 21 13 – Board Insulation

.5 Section 07 21 19 – Spray in Place Urethane Foam Insulation.

.6 Section 07 62 00 – Sheet Metal Flashing & Trim.

1.3 REFERENCES

.1 Canadian Construction Documents Committee

.1 CCDC 2 - Stipulated Price Contract.

.2 Canadian General Standards Board (CGSB)

.1 CAN/CGSB-19.13M-[M87], Sealing Compound, One Component, Elastomeric Chemical Curing.

.2 CAN/CGSB-19.18M-[M87], Sealing Compound, One Component, Silicone Base Solvent Curing.

.3 CAN/CGSB-19.24M-[M90], Multi-Component, Chemical Curing Sealing Compound.

.4 CGSB 19-GP-14M-[76], Sealing Compound, One Component, Butyl-Polyisobutylene Polymer Base, Solvent Curing.

.3 NBCC 1995; Part 5 - Environmental Separation

.4 Sealant and Waterproofer's Institute - Sealant and Caulking Guide Specification.

1.4 SUBMITTALS

.1 Submit shop drawings in accordance with Section 01 33 00 - Submittal Procedures.

.2 Submit manufacturer’s product data sheets in accordance with Section 01 33 00 - Submittal Procedures.

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.3 Submit manufacturer=s installation instructions in accordance with Section 01 33 00 - Submittal Procedures.

1.5 QUALITY ASSURANCE

.1 Perform Work in accordance with Sealant and Waterproofer's Institute - Sealant and Caulking Guide Specification requirements for materials and installation.

.2 Maintain one copy of documents on site.

1.6 QUALIFICATIONS

.1 Applicator: Company specializing in performing work of this section with documented experience with installation of air/vapour barrier systems. Completed installation must be approved by the material manufacturer. .

.2 Applicator: Company who is currently licensed by National Air Barrier Association or certifying organization must maintain their license throughout the duration of the project.

1.7 DELIVERY, STORAGE AND HANDLING

.1 Deliver, store and handle materials in accordance with Section 01 61 00 - Common Product Requirements.

.2 Deliver, store and handle materials in accordance with manufacturer=s written instructions.

.3 Avoid spillage. Immediately notify Consultant if spillage occurs and start clean up procedures.

.4 Clean spills and leave area as it was prior to spill.

1.8 WASTE MANAGEMENT AND DISPOSAL

.1 Place materials defined as hazardous or toxic waste in designated containers.

.2 Ensure emptied containers are sealed and stored safely for disposal away from children.

1.9 PROJECT ENVIRONMENTAL REQUIREMENTS

.1 Do not install solvent curing sealants or vapour release adhesive materials in enclosed spaces without ventilation.

.2 Ventilate enclosed spaces in accordance with Section 01 51 00 - Temporary Utilities.

.3 Maintain temperature and humidity recommended by materials manufactures before, during and after installation.

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1.10 SEQUENCING

.1 Sequence work to permit installation of materials in conjunction with related materials and seals.

Part 2 Products

2.1 SHEET MATERIALS

.1 Refer to technical data sheets for physical properties of product.

.2 Sheet Seal Type [1]: Self-Adhesive bitumen laminated to high-density polyethylene film, nominal total thickness of 1 to 4 mm as indicated.

.1 Acceptable material: Bakor Blueskin AG, adhesive grade membrane, use ‘peel and stick’ Blueskin where Air-Bloc 21 not present or equal Blueskin SA or TG or Soprema ‘Sopraseal Stick.’

.2 Sealant and Adhesive as recommended by Manufacturer.

.3 Transition membrane adhesive to be Bakor Air-Bloc 21.

.4 Air Barrier Membrane to be Bakor Air-Bloc 21.

2.2 SEALANTS

.1 Sealants in accordance with Section 07 92 10 - Joint Sealing.

.2 Primer: Recommended by sealant manufacturer and Appropriate to application.

.3 Substrate Cleaner: Non-corrosive type recommended by sealant manufacturer and compatible with adjacent materials.

2.3 ADHESIVES

.1 Adhesive to be ‘Air-Bloc 21’ by Bakor.

2.4 ACCESSORIES

.1 Thinner and cleaner for As recommended by sheet material manufacturer.

.2 Stick-Clips: Perforated Galvanized steel anchors.

Part 3 Execution

3.1 EXAMINATION

.1 Verify that surfaces and conditions are ready to accept the Work of this section.

.2 Ensure all surfaces are clean, dry, sound, smooth, continuous and comply with air barrier manufacturer=s requirements.

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.3 Report any unsatisfactory conditions to the [Engineer] [Consultant] in writing.

.4 Do not start work until deficiencies have been corrected. Commencement of Work implies acceptance of conditions.

3.2 PREPARATION

.1 Remove loose or foreign matter which might impair adhesion of materials.

.2 Ensure all substrates are clean of oil or excess dust; all masonry joints struck flush, and open joints filled; and all concrete surfaces free of large voids, spalled areas or sharp protrusions.

.3 Ensure all substrates are free of surface moisture prior to application of self-adhesive membrane and primer.

.4 Ensure metal closures are free of sharp edges and burrs.

.5 Prime substrate surfaces to receive adhesive and sealants in accordance with manufacturer's instructions.

3.3 INSTALLATION

.1 Install materials strictly in accordance with manufacturer's instructions.

.2 Apply sealant within recommended application temperature ranges. Consult manufacturer when sealant cannot be applied within these temperature ranges.

3.4 PROTECTION OF WORK

.1 Protect finished Work in accordance with Section 01 61 00 - Common Product Requirements.

.2 Do not permit adjacent work to damage work of this section.

.3 Ensure finished Work is protected from climatic conditions.

3.5 SCHEDULES

.1 Wall Air/Vapour Barrier Over Outer Surface of Inner Wythe of Masonry: Trowel seal Type F over masonry unit surface to a thickness of 6 mm, seal masonry anchor penetrations air tight.

.2 Wall Air/Vapour Barrier Over Exterior Surface of Gypsum Sheathing: Place sheet seal Type G over sheathing surfaces with Adhesive Type E. Seal with Type Y sealant.

.3 Window Frame Perimeter: Lap sheet seal Type H from wall air seal surface with 75 mm of full contact over firm bearing to window frame with 25 mm of full contact. Edge seal with Type Z sealant.

.4 Wall and Roof Junction: Lap sheet seal Type J from wall seal material with 150 mm of contact over firm bearing to roof air seal membrane with 100 mm of full contact. Seal with Type X sealant.

.5 Roof System Air/Vapour Barrier Over Steel Deck: Gypsum sheathing, taped joints, apply membrane air seal Type K over sheathing surfaces with Adhesive Type D; edge seal membrane with Type Y sealant

END OF SECTION

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Part 1 General

1.1 RELATED SECTIONS

.1 Section 01 33 00 - Submittal Procedures.

.2 Section 07 27 10 – Air Barriers.

.3 Section 07 21 13 – Board Insulation.

.4 Section 05 50 00 - Metal Fabrications.

.5 Section 07 44 56 – Composite Panels.

1.2 REFERENCES

.1 American Association (AA)

.1 DAF-45-[03], Designation System for Aluminium Finishes.

.2 American Society of Heating, Refrigeration and Air Conditioning Engineers (ASHRAE)

.3 American Society for Testing and Materials International, (ASTM)

.1 ASTM A653/A653M-[02a], Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process.

.2 ASTM A792/A792M-[02], Specification for Steel Sheet, 55% Aluminium-Zinc Alloy-Coated by the Hot-Dip Process.

.3 ASTM D523-[89(1999)], Test Method for Specular Gloss.

.4 ASTM D822-[01], Standard Practice, For Conducting Test on Paint and Related Coatings and Materials Using Filtered Open-Flame Carbon-Arc Light and Water Exposure Apparatus.

.5 ASTM D2832-[92 (1999)], Guide for Determining Volatile and Nonvolatile Content of Paint and Related Coatings.

.4 Canadian General Standards Board (CGSB)

.1 CAN/CGSB-93.1-[M85], Sheet, Aluminium Alloy, Prefinished, Residential.

.5 Canadian Standards Association (CSA International)

.1 CSA S136-[01], North American Specification for the Design of Cold-Formed Steel Structural Members.

.2 CSA S136.1-[01], Commentary on North American Specification for the Design of Cold-Formed Steel Structural Members.

.6 Environmental Choice Program (ECP)

.1 CCD-016-[97], Thermal Insulation.

.2 CCD-046[95], Adhesives.

.3 CCD-046-[95], Sealants and Caulking Compounds.

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1.3 SYSTEM DESCRIPTION

.1 Design Requirements:

.2 Design, fabricate and erect a pressure equalized wall panel system to meet the following requirements.

.1 Rain Penetration: prevent rain penetration through wall system. Design system based on “Rain Screen Principle” per the National Research Council. Incorporate means of draining to the exterior.

.2 Wind load: Design wall system to resist wind loads, positive and negative, expected in this geographical region (OBC climatic data, 100 years probability) without causing rattling, vibration or excessive deflection of panels, overstressing of fasteners, clips and other detrimental effects on system.

.3 Structural and thermal movement: Accommodate movement of supporting structural framing and movement caused by thermal expansion and contraction of system component parts without causing bowing, buckling, delamination, oil canning, failure of joint seals, excessive stress on fasteners or any other detrimental effects.

.3 Panel flatness tolerance: Fabricate panels not exceeding the following tolerances:

.1 Rises and falls across the panel, (local bumps and depressions) will not be accepted.

.2 1.5 mm in a concave/ convex direction, measured perpendicular to the normal plane.

.4 Panel removal: System/ procedure to allow removal of individual panels within wall system.

.5 Maximum deviation from vertical and horizontal alignment of erected panels: 6 mm in 6 m.

.6 Testing: Provide wall assembly that has been tested and certified to conform to the following criteria:

.1 Structural: Provide systems that have been tested in accordance with ASTM E330 at a design pressure of 60 psf and have been certified to be without permanent deformation or failures of structural members.

1.4 SUBMITTALS

.1 Product Data:

.1 Submit manufacturer's printed product literature, specifications and datasheet in accordance with Section 01 33 00 - Submittal Procedures.

.2 Shop Drawings:

.1 Submit shop drawings in accordance with Section 01 33 00 - Submittal Procedures.

.2 Indicate elevations, profiles, dimensions an thickness of panels and joint details.

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.3 Indicate attachment clips, system extrusions, fastening, anchor and installation details.

.3 Samples:

.1 Submit samples in accordance with Section 01 33 00 - Submittal Procedures.

.2 Submit duplicate 130 x 180 mm samples of wall system, representative of materials, finishes and colours.

.4 Production and Installation Schedule:

.1 Meeting the required schedules listed below will be required for approval of progress payments for design and fabrication.

.2 As part of base contract price, upon award of contract submit a detailed schedule with the shop drawing which outlines:

.1 submission timing of shop drawings

.2 fabrication timing from date of approved shop drawings

.3 building completion requirements for site measurements

.4 Duration of installation period

.5 dates required for installation program for work to be 100% complete by date of substantial completion

.3 Ensure the program for fabrication and installation is integrated into the General Contractor's overall project schedule.

.4 As part of base contract price, attend site meetings commencing 6 weeks prior to installation and through installation period to confirm site progress and timing of completion.

.5 Manufacturer's Instructions:

.1 Submit manufacturer's installation instructions.

1.5 MAINTENANCE DATA

.1 Provide maintenance data for cleaning and maintenance of aluminum finishes for incorporation into manual.

.2 Protect panel face with a plastic film adhered to panel in accordance with panel manufacturer's recommendation.

.3 Store components and materials in accordance with panel manufacturer's recommendations.

1.6 MOCK UP

.1 Submit mock-up in accordance with Section 013330- Submittal Procedures.

.2 Erect mock-up panel approximately 3m long x 2m high in location as directed by architect.

.3 Mock-up panel shall include all components of the wall system including subgirt flashing. Mock up will NOT be incorporated into work once approved.

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.4 Remove mock up from site following installation and acceptance of panel system.

1.7 DURANAR PANEL FINISH WARRANTY

.1 Provide a manufacturer's written warranty: Furnish panel manufacturer's written warranty covering failure of factory-applied exterior finish on composite metal panels within the warranty period; warrant finish per ASTM D 4214 for chalk not in excess of 8 NBS units and fade not in excess of 5 NBS units. Warranty period for finish: 10 years after the date of Substantial Completion.

1.8 QUALITY ASSURANCE

.1 Installation crews engaged or provided by the approved supplier shall have proven experience specifically trained and qualified in this work (written proof of minimum of five (5) years employment or service with the panel manufacturer or similar manufacturer. Individuals are to be either employees of the manufacturer and/or workers approved by the manufacturer.

.2 Provide one (1) thoroughly experienced. reliable, qualified and competent foreman in charge of the work to be on site at all times when work is taking place. Individual to be designated in charge from start of activities on site until final deficiencies are complete. Foreman may only be changed by written approval *or request* of the Consultant or owner.

.3 Panel fabricator/supplier is to have adequate plant and skilled tradesmen and is known to have manufactured and installed panel systems for a minimum of five (5) years in the Province of Ontario

1.9 MATERIAL AND WORKMANSHIP WARRANTY

.1 Warranty against defects or deficiencies shall be for a period of one year from date of substantial completion.

1.10 WASTE MANAGEMENT AND DISPOSAL

.1 Remove from site and dispose of packaging materials at appropriate recycling facilities.

.2 Collect and separate for disposal paper, plastic, polystyrene, corrugated cardboard packaging material [in appropriate on-site] bins for recycling.

.3 Divert unused metal materials from landfill to metal recycling facility approved by Consultant.

.4 Divert unused paint and joint sealer material from landfill to official hazardous material collections site approved by Consultant.

.5 Do not dispose of unused paint and joint sealer materials into sewer systems, into lakes, streams, onto ground or in locations where it will pose health or environmental hazard.

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Part 2 Products

2.1 MATERIALS

.1 Aluminum Composite Material (ACP)

.1 Pre-formed aluminum composite panels in locations as indicated on drawings.

.2 Composition: Two sheets of aluminum sandwiching a core of extruded thermoplastic formed in a continuous process without the use of glues or adhesives between dissimilar materials. Bond integrity testing to adhere to ASTM D1781-76

.3 Aluminum face sheets: Aluminum alloy 3003, thickness: 0.51 mm

.4 Panel thickness: 4 mm

.5 Panel weight: 5.28 kg/sq.m.

.6 Tolerances:

.1 Panel bow: Maximum 0.8% of panel dimension (width or length).

.2 Panel Dimensions: Take site measurements before proceeding with production unless dimensions can be guaranteed by General Contractor.

.3 Panel lines, breaks and angles to be sharp and true; panel surfaces to be free from warp or buckle.

.7 Panel System: Dry joint SL-2000 with 12.5 mm wide panel joints using proprietary aluminum extrusions or approved equal.

.8 Aluminum Composite to have a fire resistant core, meeting OBC requirements for non-combustible materials.

.9 Acceptable materials and manufacturers:

.1 Alucobond Plus, Alpolic; Kanalco Ltd., Flynn Canada, Alcotex, Alfrex FR Metal Composite Panel or others meeting the exact fire rated and compositional requirements of this specification and having colours and 'wood grain look' options to the satisfaction of the architect.

.2 Panel finishes: Duranar, three coat, coil-coated baked enamel finish containing Kynar 500 polyvinylidene fluoride resin, metallic finish as specified below.

.3 Panel Colours: Allow for 2 colours:

.1 **Colour Type 1**: 'wood grain look' in a medium to light wood tone, as selected by consultant from manufacturer's full colour range, including specialty stock colours/finishes.

.2 **Colour Type 2**: light grey/white as selected by consultant from manufacturer's full colour range, including metallic series.

.3 Locations: Wall panels, Canopies and Roof Fascias as noted on drawings.

.4 Contractor to submit triplicate samples of colours for review by Consultant prior to order and fabrication.

.4 Panel and Wall Accessories

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.1 Provide proprietary aluminum extrusions to manufacturer's standard profiles for a complete installation.

.2 Provide aluminum integrated roof parapet cap flashing where indicated on drawings.

.3 Provide 'ISO Clips' (thermal isolation clips) as manufactured by Northern Facades or approved equivalent. Provide at all connection locations to reduce thermal bridging.

.4 Fasteners: as recommended by panel manufacturer, concealed and non-corrosive.

.5 Extrusions and extrusion clips for attaching panels to the sub-structure: Purpose made aluminum.

.6 Extrusions shall be full length around panel perimeter for panel reinforcement and alignment. Intermittent clips are unacceptable.

.7 Joint filler strip: Same material and color as panels. Use of caulking at joints is not acceptable.

.8 Plastic shims, shall be used as thermal separator between extrusions and sub-girts.

.9 Sub-girts: To be manufactured from G-90 galvanized steel and shall be designed to accommodate expansion and contraction, dynamic movements and design load requirements.

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 PREPARATION

.1 Protect metal surfaces in contact with concrete, masonry mortar, plaster or other cementitious surface with isolation coating.

3.3 INSTALLATION

.1 Wall Panel System:

.1 Before proceeding, examine work of other sections upon which this section depends.

.2 Sub-girts: Prior to installation of insulation air vapour barrier under Section 072710- Air Barriers erect subgirts fastened to masonry wall in accordance with system manufacture's installation instructions. Ensure that all penetrations through air/ vapor barrier are sealed.

.3 After installation of insulation/ air vapour barrier under Section 072710 – Air Barriers and Section 072113 – Board Insulation, erect panels and joint filler strip in accordance with manufacturer's details to meet specified design criteria and performance.

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.4 Finished work shall be securely anchored, free of distortion, free of surface imperfections and uniform in colour.

.5 Use concealed fastenings only.

.6 Install panels plumb, true, level and in alignment to established lines and elevations.

3.4 CONTROL/EXPANSION JOINTS

.1 Construct control and expansion joints where required or as indicated.

.2 Use cover sheets, of brake formed profile, of same material and finish as adjacent material.

.3 Use mechanical fasteners to secure sheet materials.

.4 Assemble and secure wall system to structural frame so stresses on sealants are within manufacturers' recommended limits.

3.5 FIELD QUALITY CONTROL

.1 Have manufacturer of products supplied under this Section review Work involved in handling, installation/application, protection and cleaning of its product[s], and submit written reports in acceptable format to verify compliance of Work with Contract.

.2 Manufacturer's field services: Provide manufacturer's field services consisting of product use recommendations and periodic site visits for inspection of product installation in accordance with manufacturer's instructions.

.3 Manufacturer to schedule site visits to review Work at stages listed:

.1 After delivery and storage of products, and when preparatory Work on which Work of this Section depends is complete, but before installation begins.

.2 Three times during progress of Work: at start up, at 25% and 70% complete.

.3 Upon completion of Work, after cleaning is carried out.

.4 Obtain reports within three days of review and submit.

3.6 CLEANING

.1 Perform cleaning after installation to remove construction and accumulated environmental dirt.

.2 Wash down exposed interior and exterior surfaces using solution of mild domestic detergent in warm water, applied with soft clean wiping cloths. Wipe interior surfaces clean as part of final clean-up.

.3 Remove excess sealant with recommended solvent.

.4 Upon completion of installation, remove surplus materials, rubbish, tools and equipment barriers.

.5 Remove protective plastic film from panels.

.6 Repair and touch-up with colour matching high grade enamel minor surface damage.

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.7 Replace damaged panels and components which cannot be satisfactorily repaired.

END OF SECTION

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Part 1 General

1.1 SECTION INCLUDES

.1 Requirements for the installation of preformed metal cladding/siding.

1.2 RELATED SECTIONS

.1 Section 01 33 00 - Submittal Procedures.

.2 Section 06 10 11 – Rough Carpentry.

.3 Section 04 21 13 – Masonry.

.4 Section 07 21 19 – Sprayed in Place Urethane Foam Insulation.

.5 Section 07 21 13 – Rigid Board Insulation

.6 Section 07 41 43 – Aluminium Composite Panels.

1.3 REFERENCES

.1 American National Standards Institute (ANSI).

.1 ANSI B18.6.4-[99], Thread Forming and Thread Cutting Tapping Screws and Metallic Drive Screws.

.2 American Society for Testing and Materials International, (ASTM).

.1 ASTM D2369-[03], Test Method for Volatile Content of Coatings.

.2 ASTM D2832-[92(R1999)], Guide for Determining Volatile and Non-volatile Content of Paint and Related Coatings.

.3 ASTM D5116-[97], Guide For Small-Scale Environmental Chamber Determinations of Organic Emissions From Indoor Materials/Products.

.3 Canadian General Standards Board (CGSB).

.1 CAN/CGSB-51.32-[M77], Sheathing, Membrane, Breather Type.

.2 CAN/CGSB-93.2-[M91], Prefinished Aluminium Siding, Soffits and Fascia, for Residential Use.

.3 CGSB 93.5-[92], Installation of Metal Residential Siding, Soffits and Fascia.

.4 Canadian Standards Association (CSA International).

.1 CSA B111-[1974(R2003)], Wire Nails, Spikes and Staples.

.5 Environmental Choice Program (ECP).

.1 CCD-045-[95], Sealants and Caulking Compounds.

.6 Underwriters' Laboratories of Canada (ULC).

.1 CAN/ULC-S706-[02], Wood Fibre Thermal Insulation for Buildings.

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1.4 SUBMITTALS

.1 Shop Drawings:

.1 Submit shop drawings in accordance with Section 01 33 00 - Submittal Procedures.

.2 Indicate arrangement of sheets and joints, types and locations of fasteners and special shapes and relationship of panels to structural support members or support wall.

.3 Clearly detail and indicate locations of all Z clips, J-closures and edge trims.

.4 Describe in shop drawing details, suitable accommodation for the removal and joining of future cladding as described in 1.2.7 of this section and on drawings.

.2 Samples:

.1 Submit samples in accordance with Section 01 33 00 - Submittal Procedures.

.2 Submit duplicate 300 x 300 mm samples of siding material, of colour and profile specified.

.3 Manufacturer's Instructions:

.1 Submit manufacturer's installation instructions.

1.5 WASTE MANAGEMENT AND DISPOSAL

.1 Divert used metal cut-offs from landfill by disposal [into the on-site metals recycling bin] [removed for disposal at the nearest metal recycling facility].

.2 Divert reusable materials for reuse at nearest used building materials facility.

.3 Divert unused caulking, sealants, and adhesive materials from landfill through disposal at hazardous material depot.

1.6 EXTENDED WARRANTY

.1 Submit a warranty for metal siding system, covering materials and labour and the repair or replacement of defective work in accordance with the Contract, but for five (5) years total.

Part 2 Products

2.1 METAL SIDING

.1 **Horizontal Metal Siding - extruded aluminum** (light grey.white):

.1 Thickness: 11 gauge aluminum

.2 150mm (6”) wide ‘Channel’ siding & soffit profile x 7315mm long (24’) minimum.

.3 Location: Refer to drawings.

.4 Colour: To be selected from manufacturer’s full range of solid colours and wood effect options.

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.5 Approved manufacturers: Longboard (aluminum) by Mayne Coatings Corp., Langley, BC, Knotwood extruded aluminum siding, Luxyclad, AL13 Architectural Systems aluminum extruded plank, FORME Design extruded aluminum siding or others approved with similar material, profile, pattern and shade.

.6 Vertical lengths to be single, continuous length (no seams).

.2 **Prefinished Vertical Corrugated Siding** – **prefinished steel** (light grey/white):

.1 7/8" Corrugated steel siding, 22 gauge, by Vicwest or Agway Metals Inc.

.2 Location: Exterior siding. Refer to Exterior Elevations.

.3 Colour: White. Exact shade to be confirmed from full colour selection.

.4 Approved alternate with similar profile and colour.

.3 For copings and flashings, provide prefinished metal 24 gauge thickness, colours as specified in Section 076200- Sheet Metal Flashing and Trim.

.4 For metal framing refer to Contract Drawings.

.5 Screws: to CSA B35.3-1962, any exposed fasteners to have head color same as exterior sheet finish, dished to CSA B35.3-1962.

.6 Powder actuated fasteners: galvanized, peened ballistic point, plastic cap of same color as exterior sheet.

.7 Provide 'ISO Clips' (thermal isolation clips) as manufactured by Northern Facades or approved equivalent. Provide at all connection locations to reduce thermal bridging.

.8 Sealants: in accordance with Section 079210- Joint Sealers, colour selected by Consultant. Allow for one (1) colour from manufacturers full range to match adjacent metal.

.9 Gaskets: soft pliable arctic grade vinyl, extruded profile.

.10 Touch-up paint: as recommended by panel manufacturer and Baycoat, compatible with prefinished coating.

.11 Provide purpose made material separators between dissimilar metal materials to avoid corrosion.

.12 Isolation coating: alkali resistant bituminous paint or epoxy resin solution.

.13 Insulation: As noted on Drawings and in Section 072113 – Board Insulation, and sections pertaining to Insulation and Sheet Air/Vapour Barrier transition membrane.

2.2 COMPONENTS

.1 Exterior sheet: factory preformed coated metal, to profiles and thicknesses as indicated.

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.2 Exterior corners: of same profile, material and finish as adjacent siding material, shop cut and brake formed to required angle, concealed corner brace, hairline exposed joint, pop rivet connections with painted head to match siding.

.3 Exposed joint ends of siding sheet shop cut clean and square, backed with tight fitting filler lapping back if joint, exposed components color matched to siding.

.4 Accessories: cap flashings, drip flashings, internal corner flashings, copings and closures for head, jamb, eaves, soffits sill and corners, of same material and finish as exterior siding, brake formed to shape. Exposed cut edges of metal profiles will not be accepted.

.5 Sub-girts: zinc coated to ASTM A525-78a, G90 coating designation, profile as indicated to accept exterior sheet with structural attachment to building frame.

2.3 FASTENERS

.1 Nails: CSA B111. Screws: ANSI B18.6.4.

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 INSTALLATION

.1 Install cladding in accordance with CGSB 93.5, and manufacturer's written instructions

.2 Install sub-girts to masonry walls prior to the installation of the Urethane foam insulation

.3 Install exterior finish siding to internal sub-girts with concealed fasteners.

.4 Provide notched and formed closures, sealed to arrest direct weather penetration at vertical profiles for exterior siding. Ensure continuity of "pressure equalization" of rain screen principle.

.5 Provide alignment bars, brackets, clips, inserts, shims as required to securely and permanently fasten wall system to building structure.

.6 Supply and install flashing at connection between roof and preformed metal siding.

3.3 CONTROL JOINTS

.1 Construct control joints, as indicated.

.2 Use cover sheets, of brake formed profile, of same material and finish as adjacent material.

.3 Use mechanical fasteners to secure sheet Expansion Joints materials.

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.4 Assemble and secure wall system to structural frame so stresses on sealants are within manufacturer's recommended limits.

3.4 CLEANING

.1 Upon completion of installation, remove surplus materials, rubbish, tools and equipment barriers.

.2 Wash down exposed surfaces using solution of mild domestic detergent in warm water, applied with soft clean wiping cloths.

.3 Remove excess sealant with recommended solvent.

END OF SECTION

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1. GENERAL

1.1 Section Includes

1. Section includes for provision of all labour, materials, equipment and services for SBS Modified Bituminous Membrane Roofing in accordance with Contract Documents.

1.2 Related Sections

1. Section 06 10 11 Rough Carpentry
2. Section 07 62 00 Sheet Metal Flashing and Trim
3. Section 07 92 00 Joint Sealers

1.3 References

1. CAN/CSA A123.21 – Standard Test Method For The Dynamic Wind Uplift Resistance of Membrane Roofing Systems
2. CAN/CSA A123.4 - Bitumen for Use in Construction of Built-Up Roof Coverings and Waterproofing Systems.
3. CGSB-37-GP-56 - Membrane, Modified, Bituminous, Prefabricated and Reinforced for Roofing.
4. CGSB 37-GP-9 - Primer, Asphalt for Asphalt Roofing, Dampproofing and Waterproofing.
5. CAN/ULC–S107 – Fire Test of Roof Covering
6. CAN/ULC–S126 – Fire Spread Under Roof Deck Assemblies
7. CAN/ULC-S701 Thermal Insulation, Polystyrene, Boards and Pipe Covering
8. CAN/ULC–S702 – Mineral Fibre Thermal Insulation for Buildings.
9. CAN/ULC-S704 - Thermal Insulation, Polyurethane and Polyisocyanurate Boards, Faced.
10. CAN/ULC-S706 – Wood Fibre Thermal Insulation for Buildings.
11. CAN/ULC S770 - Standard Test Method for Determination of Long-term Thermal Resistance of Closed-cell Thermal Insulating Foams
12. ASTM E108 – Standard Test Methods for Fire Tests of Roof Coverings
13. ASTM C1289 - Standard Specification for Faced Rigid Cellular Polyisocyanurate Thermal Insulation Board
14. ASTM D312 - Standard Specification for Asphalt Used in Roofing
15. Canadian Roofing Contractors Association (CRCA) – Specification Manual

1.4 Operations

1. Perform operations, at times designated by the *Owner*, that will not adversely affect occupants of building and operations in and around site access and egress.

2. *Contractor* shall undertake all reasonable measures to reduce vibration and noise level on the roof decks during work hours.

3. Should specific complaints be issued by *Owner* to this matter, *Consultant* reserves the right to have *Contractor* proceed with other facets of the Work.

1.5 Shop Drawings and Other Submittals

1. Submit to *Consultant* for review, shop drawings, prior to commencement of work. Provide six (6) copies of the shop drawings. Indicate on shop drawings all insulation layers, slopes, crickets, insulation sumps and drainage patterns.

2. Submit Shop Drawings for: Tapered Insulation indicating on shop drawings all insulation layers, slopes, crickets, insulation sumps and drainage patterns.

3. Submit Shop Drawings for: Gas Line Supports and Roof Access Ladders designed and stamped by Professional Engineer licensed in the province of Ontario.

4. Submit Material List and Shop Drawings to *Consultant* for review prior to ordering materials and commencing Work.

5. Refer to 01 33 00 Submittal Procedures.

1.6 Quality Assurance

1. Skilled trades and *Contractor*s having a minimum of five (5) years related experience shall execute roofing Work.

2. *Contractors* shall be approved applicators of system specified. Documentation shall be provided prior to commencing Work.

1.7 Roof System Compliance

1. Submit a document issued by Authorities having jurisdiction certifying that roof system meets requirements of CAN/ULC-S107 “Fire Tests of Roof Coverings’, Class A, B or C.

2. Roof system is based on a 2-ply SBS Modified Bituminous Membrane System by Soprema Inc**.**

3. *Alternates by: IKO Industries Ltd., Henry Company Canada (Bakor), Tremco or John Manville are acceptable.*

4. Alternatives may be considered upon submittal and review of technical data sheets and fire resistance test results and warranty specimen demonstrating product suitability and compliance.

1.8 Insulation Requirements

1. Polyisocyanurate Roof Insulation Manufacturers shall be members of Polyisocyanurate Insulation Manufacturers Association (PIMA). Manufacturers shall submit documentation listing their LTTR values based on CAN/ULC and ASTM test methods for 2014.

2. In multiple layer applications, if thicknesses greater than 38 mm (1.5 in.) are required, thicker layer shall be installed in bottom followed by minimum 38 mm (1.5 in.) top layer.

1.9 Warranty

1. Provide Standard Form of Warranty including all labour, material and workmanship and a Preventative Maintenance Manual.

2. Warranty shall be for a period of two (2) years from date of Substantial Performance, as certified by *Consultant*.

3. Provide fifteen (15) year roof membrane manufacturer's Warranty for labour, materials and workmanship with a No Dollar Limit from date of Substantial Performance.

4. Repair leaks into building or roofing assembly within 24 hours of notification. Repair all roof membrane deficiencies, including ridges, blisters, splits and bare spots.

5. Carry out all repair work during the warranty period as directed by the *Consultant* and at no additional cost to the *Owner*. *Contractor* shall extend Warranty on replaced parts and workmanship for a period of two (2) years from date of acceptance of replacement parts and workmanship.

6. Defects shall include but will not be limited to: leaking; failure to stay in place; lifting; blow off; deformation; and breaking of weathertight seals.

1.10 Delivery, Storage and Handling

1. All Products shall be delivered, stored and handled in accordance with the Contract Documents, be in original manufacturer wrapping with labels intact and clearly identifying the product.

2. All modified bitumen membranes that will be used for installation on a daily basis must be stored at a minimum of 15ºC (58ºF) for a period of at least 4 hours prior to application. Stand rolled materials on end and protect edges.

3. Products transported, stored or handled in a manner that contradicts the Contract Documents, shall not be installed at the Place of the Work, shall be marked and removed from site.

4. Bills of lading for bulk loads of liquid asphalt shall be submitted to *Consultant* showing; Type of Asphalt, Quantity of Asphalt, Equiviscous temperature (EVT), Final Blowing Temperature (FBT) and Flash Point Temperature (FPT) of Bitumen.

5. Insulation, bituminous felts, vapour retarders and roofing membranes must be kept dry under protective coverings or stored in trailers.

6. Plastic wrapping installed at the factory is not to be used as an outside storage cover. Emulsions must be maintained at temperatures above freezing.

7. Immediately remove and dispose of wet materials off site. Do not hoist materials with straps/ropes that damage materials. Use specialty supports.

8. Hoist material to roof surface on a daily basis, for same day use. Do not 'drop' materials during handling and installation.

1.11 Environmental Requirements

1. Do not install roofing when temperature remains below 0ºF (-18ºC) for torch applications and 23ºF (-5ºC) for asphalt applications.

2. Removal and installation of any roof components during inclement weather is not permitted.

1.12 Scaffolding, Ladders and Conveyances

1. Provide scaffolding, ladders and conveyances required for execution of Work and in accordance with the Contract Documents. Provide all hoisting equipment and barricades required to complete the Work.

2. Construct and maintain scaffolding in accordance with authorities having jurisdiction. If required, have scaffolding designed and stamped by Professional Engineer licensed in Province of Ontario.

1.13 Safety Requirements and Barriers

1. *Contractor* shall provide upstanding barrier protection at all perimeters, eaves and parapets. Mesh, screen and tarpaulins shall also be provided to prevent debris from blowing or falling over edge. Barriers shall be adequately constructed and secured to prevent toppling over.

2. Fire extinguishers must be on site within 3 m (10 ft.) and at same level as torch applicator. Maintain adequate fire watch (as recommended by membrane manufacturer) after each days roofing operations cease.

3. Prior to leaving site, use digital thermometer to scan roof surface temperature for 'any hot spots' and address them accordingly.

1.14 Protection

1. On a daily basis, provide interior protection to equipment, services, material, floors and walls by use of polyethylene or drop sheets, tape, tarps, plywood sheathing or other means to effectively protect contents.

2. Protect work of this section from damage. Damaged work which cannot be satisfactorily repaired, restored or cleaned shall be replaced at no cost to *Owner*.

3. Protect work of other sections from damage while performing roofing work. Provide tarpaulins and other coverings, as required, to protect lower and adjacent walls, finishes and surfaces. Additional protection shall be provided if instructed by *Consultant*.

4. Work is to be performed on occupied buildings. Take all reasonable precautions to protect against entry of elements and persons to unauthorized areas.

5. Prevent bitumen, precipitation and debris entering openings and drains during work. Prevent damage to site, roads, curbs and building elements.

6. Protect finished roof surfaces with minimum 13 mm (1/2 in.) plywood sheathing with 25 mm (1 in.) polystyrene insulation board on underside.

7. Damaged areas and surfaces shall be repaired to satisfaction of *Consultant* at no additional cost to *Owner*.

1.15 Temporary Facilities

1. Provide temporary storage facilities for materials, tools and equipment. Location to be approved by *Owner*.

2. Provide temporary washroom facilities for workers. Secure portable washrooms to adjacent fences or walls to prevent toppling over.

3. Ground work stations shall be fully enclosed by temporary fencing and be manned at all times.

4. Kettles and disposal bins shall be located minimum 2 m (6’-6”) away from building walls.

1.16 Fastenings

1. Fasteners, anchors and adhesives shall be of appropriate size and type and must be used in sufficient quantity to provide positive and permanent anchorage of component.

2. Fastenings which cause spalling or cracking of material to which anchorage is being made are not permitted.

3. Powder-actuated fastening devices are not permitted on this project. Only low velocity plunger-type devices are permitted.

1.17 New Roof Systems

1. New Roof Systems at Place of The Work are as follows and include all miscellaneous items;

1. <u>Roof Areas – Acoustic Metal Deck</u>

- Sheet Metal Flashing, Trim, & Sealants
- 2-Ply Modified Bituminous Membrane Flashings
- 1-Ply Modified Bituminous Membrane Cap Sheet

- Overlay Board with Integral Membrane Base Sheet – In Asphalt
- Tapered Insulation – In Asphalt
- 2-Layers of 75 mm (3 in.) Polyisocyanurate Insulation – In Asphalt
- Thermal Barrier / Vapour Retarder – In Adhesive
- Acoustic Mineral Insulation
- Acoustic Metal Deck

2. <u>Roof Areas – Metal Deck or Pre-Cast Concrete</u>

- Sheet Metal Flashing, Trim, & Sealants
- 2-Ply Modified Bituminous Membrane Flashings
- 1-Ply Modified Bituminous Membrane Cap Sheet
- Overlay Board with Integral Membrane Base Sheet – In Asphalt
- Tapered Insulation– In Asphalt
- 2-Layers of 75 mm (3 in.) Polyisocyanurate Insulation
  First Layer - Mechanically Fastened, Second Layer – In Asphalt (Metal Deck)
  First Layer - In Asphalt, Second Layer – In Asphalt (Pre-cast Concrete)
- Self-Adhesive Vapour Retarder
- Metal Deck or Pre-Cast Concrete

2. PRODUCTS

2.1 Material

1. Primer:

    1. Asphalt Cutback Primer
    2. Self-Adhesive Membrane Primer: Elastocol Stick by Soprema Inc.
    3. Modified Membrane Primer: Elastocol 500 by Soprema Inc.
    4. Metal Deck Primer: Rustguard Q.D. Shop Coat Primer by Devoe Coatings
    5. Pitch Primer: Universal Primer as manufactured by Millennium Adhesive Company and supplied by Soprema Inc.

2. Bitumen:

    1. Type II and Type III by Bitumar
    2. Easy Melt 200 by IKO Industries Limited

3. Acoustic Insulation: Metal Deck Flute Filler by ModulR TS, custom cut to metal deck profile and thickness.

4. Vapour Retarder – **Concrete / Core Slab**: Non-woven polyester SBS Modified Bitumen Membrane, Thermofusible plastic film on underside and sanded surface.

    1. Sopralene 180 SP 3.5mm and Elastocol 500 by Soprema Inc.

5. Vapour Retarder – **Metal Deck**:

1. Sopravap'r and Elastocol Stick Primer by Soprema Inc.

6. Thermal Barrier/Vapour Retarder – **Acoustic Metal Decks**: 15.8mm x 910mm x 2440 mm (1in. x 3 ft. x 8 ft.) 2-1 SOPRASMART ROCK SANDED by Soprema Inc., semi-rigid panel with a sanded SBS modified bituminous membrane, with a non-woven polyester reinforcement, factory laminated on a high density, mineral fibre board, minimum Thermal Resistance of RSI-0.7 (R-4.0.) per 25.4 mm (1 in.)

7. Thermal Barrier Deck Adhesive: 'Duotack 365' urethane adhesive by Soprema Inc.

8. Thermal Barrier Laps & primer: Sopralap Stick and Elastocol Stick by Soprema Inc.

9. Base and Tapered Insulation, and Overlay Board Adhesive: "Duotack 365' urethane adhesive by Soprema Inc.

10. Vapour Retarder transition membrane at Perimeters/Curbs/Walls: Sopralap Stick and Elastocol Stick by Soprema Inc.

11. Base Insulation: 2 Layers Required - 75 x 1220 x 1220 mm (3 in. x 4 ft. x 4 ft.), comprising of rigid closed cell polyisocyanurate foam core, bonded with all inorganic fibre glass reinforced facer on each side. *Minimum long-term thermal resistance (LTTR) of RSI 1.00 (R 5.7) per 25 mm (1 in.) thickness.*
Note: 75 mm and 50 mm(2 in. and 3 in.) required in Tapered Sump.

*L*ong-Term *Thermal Resistance shall be: RSI 3.06 (R17.4) per 75 mm (3 in.)*

1. SOPRA-ISO PLUS by Soprema Inc.
2. AC Foam III by Atlas Corporation Ltd.
3. H-Shield CG by Hunter Panels
4. Approved Alternate – Acceptable for System Warranty

Note: All polyisocyanurate insulation boards shall be provided by one manufacturer with same production dates and lot numbers and letter submitted regarding claimed R-values.

12. Mechanical Fasteners for Base Layer Insulation: Factory Mutual (FM) Class 1, No.12 coated screws and 75 mm (3 in.) galvanized metal plate. Fasteners to be of sufficient length to penetrate crest of metal deck 19 mm only (3/4 in.). *Contractor* to confirm actual size(s).

13. Tapered Insulation, Crickets & Backslope: Fabricated from high density, wax impregnated rigid fiberboard. Density to be a minimum of 0.27 g/cm^3 (17 pcf). Compressive strength minimum of 289 kPa (42 psi) at 5% consolidation. Fabricate tapered insulation to layouts and slopes of 1%, 2% and 4% as indicated on drawings with minimum thickness of 3 mm (1/8 in.). Acceptable Suppliers:

1. Accu-Plane Enterprises Inc.
2. Posi-Slope Enterprises Inc.
3. Simplex Tapered Design systems by SOPREMA

14. Wood cant' shall be provided, applied in full mopping of asphalt to provide smooth transition at abutting roof areas.

15. Overlay Board: 14.7 x 914 x 2440 mm (9/16 in. x 3 ft. x 8 ft.) semi-rigid panel with an SBS modified bituminous membrane, with a non-woven polyester reinforcement with a thermofusible plastic film on top side, factory laminated on a high density, mineral fibre board. Thermal Resistance of RSI-0.7 (R-4.0.) per 25.4 mm (1 in.). Mineral Fibre = 25 mm (1 in.) and Membrane Base Sheet = 2.2 mm (86.6 mils)

    1. 2-1 SOPRASMART ROCK by Soprema Inc.

16. Protection Board (At Drain Sump): 6.4 x 1220 x 1525 mm (1/4 in. x 4 ft. x 5 ft.) semi-rigid protection board composed of a mineral fortified asphaltic core formed between two saturated fibreglass felts.

    1. Sopraboard by Soprema Inc.

17. Cover Strip: Cover strip composed of SBS Modified Bitumen Membrane with a composite reinforcement. Thermofusible plastic film on top and bottom side .

    1. Sopralap by Soprema Inc.

18. Modified Bituminous Membrane Base Sheet (Target Patches)**:**

    1. Sopralene Flam 180 by Soprema Inc.

19. Modified Bituminous Membrane Base Sheet Flashings:

    1. SOPRAPLY Flam Stick and Elastocol Stick Primer (where torching is not safe).
    2. Sopralene Flam 180 by Soprema Inc. – for flanges (where torching is safe).

20. Modified Bituminous Membrane Liquid Flashings: Polyurethane/bitumen resin ‘Alsan Flashing’ and 150 mm (6 in.) wide fabric reinforcement by Soprema Inc.

21. Modified Bituminous Membrane Cap Sheet (Grey Granules): Sopralene Flam 250 GR by Soprema Inc.

22. Modified Bituminous Membrane Cap Sheet Flashings (Grey Granules): Sopralene Flam 250 GR by Soprema Inc.

23. Liquid Flashings for Penetrations: Polyurethane/bitumen resin ‘Alsan Flashing’ and polyester reinforcement by Soprema Inc.

24. Mastic: Sopramastic by Soprema Inc.

25. Self-adhesive, flame-stop tape with glass mat reinforcement: Sopraguard Tape:

26. Round Top Cap Nails: Ardox spiral shank with 25 mm (1 in.) steel washer

27. Bulk Granules: Coloured granules in bulk to match cap sheet.

28. Pitch-Pans:

    1. Sopramasrtic Block,Sopramastic SP2 sealant and SOPRAMASTIC PF filler by Soprema Inc.

    2. ChemCurb System by Chem Link, which shall include sealer and filler.

    3. Fabricated from 0.71 mm (24 gauge) stainless steel, 100 mm (4 in.) high with 150 mm (6 in.) wide flanges, all seams continuously soldered. Allow 50 mm (2 in) gap all around protrusion for pitch-pan filler.

2.2 Roofing Accessories

1. Precast Concrete Pavers: 50 x 610 x 610 mm (2 x 24 x 24 in.) "Brooklin Roof Ballast' slabs with Built-In Pedslab Pedestal System", as manufactured by Brooklin Concrete Products Limited. Colour to be natural with standard diamond texture.

2. Paver Pedestals: 25 mm (1 in.)

    a. "Roofmate" by Dow Chemical Canada Ltd.

    b. SOPRA-XPS 35 by Soprema Inc.

3. Extruded Insulation: 25 mm (1 in.) Polystyrene

    a. 'Roofmate' by Dow Chemical Canada Inc.

    b. SOPRA-XPS 35 by Soprema Inc.

4. Sprayed polyurethane foam insulation: one component polyurethane foam insulating sealant to CAN/ULC-S705,

    1. ENERFOAM by Abisko Manufacturing Inc.

    2. Duotack by Soprema Inc.

5. Mineral Batt Insulation: 'Roxul' Mineral Batt, of size and thickness to suit site requirements.

6. Aprons: Fabricated from 0.87 mm (0.034 in.) galvanized metal flashings to profile detailed.

7. Butyl Tape: 3 mm x 13 mm (1/8 x 1/2 in.) wide elastomeric butyl rubber.

8. Termination Bar: 3 mm x 25 mm (1/8 x 1 in.) extruded aluminum.

3. EXECUTION

3.1 Workmanship

1. Do work in accordance with Canadian Roofing Contractors Association Roofing Specifications Manual (CRCA) and Manufacturer's requirements except as specified within Contract Documents and to approval of *Consultant*.

2. More stringent requirements shall govern.

3.2 Examination and Preparation

1. Examine site conditions and surfaces to ensure that they are in satisfactory condition for the commencement of Work of this section.

2. Ensure that substrates are smooth, clean and dry. Clean surfaces of all substances, which may be detrimental to new roof system. Clean adhesives with solvent and allow vapours to dissipate prior to membrane application.

3. Application of the Work, or any part of it will constitute acceptance of conditions upon which work is to proceed.

3.3 Preparation of Asphalt

1. Asphalt to be heated in kettle sufficiently to provide Equiviscous Temperature (EVT) at point of application. Do not heat asphalt above its Final Blowing Temperature (FBT). Suppliers shall provide lot-specific EVT'S for mopping applications.

2. Equip kettles with working thermometers that accurately register bitumen temperatures at all times. Asphalt heated beyond 260ºC (550ºF) will be rejected and shall not be used.

3. Asphalt shall be applied at temperature not to exceed 235°C (450°F) for Polyisocyanurate insulation.

4. General asphalt temperature applications shall be in the range of: from a low of 220°C (428°F) to a high of 260°C (500°F).

5. Asphalt heated beyond 287°C (550°F) will be rejected and shall not be used.

6. *It is Contractor's sole responsibility to provide staff with temperature measuring devices to monitor kettle temperature and application temperature of asphalt. Asphalt temperatures shall be continuously monitored to maintain required range.*

7. Do not 'empty/dump' excess bitumen on roof surface/membrane so that it impedes surface drainage. *Consultant* may request that bitumen/membrane be removed and new membrane applied.

3.4 General Requirements

1. Asphalt Quantities:

1. 1.25 kg/m^2 (25 lbs. per square) asphalt for each felt mopping.
2. 1.25 kg/m^2 (25 lbs. per square) asphalt for mopped top coat.
3. 3.6 kg/m^2 (75 lbs. per square) asphalt for pour coat (If pea gravel used).
4. Type II Asphalt – for slopes of 0 – 1:12 (0-8%)
5. Type III Asphalt – for slopes of 0 – 3:12 (0-25%)

2. Complete new roof system, including vapour retarder, insulations and membrane and membrane flashings to each day's termination point and install temporary water cut-off. Remove water cut-off when work resumes.

3.5 Primer

1. Apply primer to existing membrane to remain, curbs, walls, wood and metal at a minimum rate of 0.3 to 0.5 litres/m^2 (0.96 to 1.6 fl.oz./sq.ft) with roller or spray. Do not allow primer to puddle.

2. Prevent primer from entering building interior through openings and joints in metal decks, by installing self-adhesive membrane at roof perimeters, walls, curbs and other roof openings.

3. Allow primer to cure prior to application of new roofing membrane or membrane flashings as detailed. Do not accelerate drying time by use of flame.

4. Self-adhesive membrane must be applied same day as primer.

3.6 Acoustic Mineral Insulation

1. Provide custom cut acoustic insulation and install in acoustic deck flutes to provide a continuous sound barrier. Provide tight butt joints and trim, where required to deck profile.

3.7 Adhesive for Thermal Barrier, Insulation and Overlay Board

1. Specified urethane adhesive is applied in stripes. Using the specially designed applicator, apply 19 mm (3/4 in.) to 25 mm (1 in.) wide stripes installed at 152 mm (6 in.) on centres in the field of the roof.

2. Note: On boards longer then 1220 mm (4 ft.) the adhesive ribbon shall be applied length wise on the board so that a continuous bead is provided along the exterior edge.

3. At the perimeter of all the roofs for a distance of 2.4 metres (8 feet) the adhesive shall be applied as noted above except at 152 mm (6 in.) on centres. The insulation adhesive is to be applied to these parameters or manufacturer’s recommendations whichever is more stringent.

4. In the corners of all the roofs for a distance of 3050 mm (10 feet) the adhesive shall be applied as noted at 102 mm (4 in.) on centres.

5. Thermal barrier and Insulation shall be placed immediately over the adhesive bead before a film (skin) starts to form on the adhesive bead. Avoid uneven surfaces to ensure proper and full adhesion to the underlying substrates.

6. If the boards are repositioned the adhesive bond is broken. The boards are to be removed, adhesive removed and re-applied as noted herein before re-installing the boards.

3.8 Thermal Barrier / Vapour Retarder – Acoustic Metal Deck

1. Adhesive shall be applied per Adhesive for Thermal Barrier, Insulation and Overlay Board in this Section.

2. Install new thermal barrier panels in adhesive with sides perpendicular to deck and ends supported by deck flutes and with panels placed together with moderate contact. Cut boards cleanly, avoid breaking boards to conform to roof layout.

3. Thermal barrier shall be immediately placed into adhesive bead before a film (skin) starts to form on the adhesive bead.

4. Stagger end joints of adjacent rows of boards. Use largest pieces possible but no piece shall be smaller than 305mm x 305mm (12 in. x 12 in.). Fill in voids larger than 6 mm (1/4 in.) with same material.

5. Gradually peel back silicone release paper at laps, pressing down on membrane with an aluminum applicator to ensure good contact and adhesion. Roll side and end laps to ensure adequate adhesion in the self-adhesive laps of membrane.

6. Heat weld exterior 25 mm (1 in.) edge of side lap with a hot-air gun or torch flame, where safe. Laps shall be installed to shed water, commencing from low point and working upslope.

7. Where there is no factory lap, seal butt ends with required 305 mm (12 in.) cover strip centred over lap to provide a watertight seal.

8. At all perimeters, walls, curbs and thermal barrier laps, apply cover strip to provide a continuous and waterproof system. At vertical to horizontal transitions, half the membrane shall extend onto vertical surface.

3.9 Vapour Retarder – Metal Deck

1. At all roof perimeters, walls, curbs, dividers, movement and control joints and penetrations, provide 200 mm (8 in.) self-adhesive reinforcing vapour retarder to seal openings/gaps at junction of wall and deck, to prevent primer/asphalt seepage into building.

2. Roll out vapour retarder on clean and fully primed surface. Peel back first 1000 mm (3 ft.) of release paper and adhere vapour retarder in place. Hold vapour retarder tight and peel off remaining release film diagonally.

3. Apply additional rolls in similar fashion and maintain 75 mm (3 in.) side laps and 150 mm (6 in.) end laps. Side laps shall bear on crest of deck. Roll vapour retarder onto deck and ensure all laps are sealed.

4. Seal vapour retarder to all penetrations by use of self-adhesive vapour retarder for all occasions. Prime surfaces as required.

5. Vapour retarder shall provide a continuous and watertight seal if being used as a temporary roof.

3.10 Vapour Retarder – Concrete/Core Slab

1. At all roof perimeters, walls, curbs, dividers, movement and control joints and penetrations, provide 200 mm (8 in.) self-adhesive reinforcing vapour retarder to seal openings/gaps at junction of wall and deck, to prevent primer/asphalt seepage into building.

2. Roll out vapour retarder on clean and fully primed surface. Apply vapour retarder in general conformance with details commencing from low point and working up-slope.

3. Fully torch vapour retarder to substrate to attain full bond. Use chalklines to maintain neat and straight lines. Do not walk on or step into newly applied membrane.

4. Terminate/overlap vapour retarder onto previously applied perimeter vapour retarder minimum 75 mm (3 in.).

5. Provide 3 mm (1/8 in.) bleed out at all side laps. Maintain minimum 75 mm (3 in.) side and 150 mm (6 in.) end laps. Laps shall be installed to shed water.

6. Repair defects in applications with additional piece of torch grade base sheet. Carry out repairs to satisfaction of *Consultant*.

7. Vapour retarder shall provide a continuous and watertight seal if being used as a temporary roof.

3.11 Base Insulation – Metal Deck Areas (Non Acoustic)

1. Insulation, which is damaged by moisture, shall not be used in roof system, be marked and promptly removed from site.

2. Install first layer base insulation over vapour retarder and mechanically secure into substrate to Factory Mutual FM 1-90 requirement layout pattern of five (5) fasteners per 1220 x 1220 mm (4 x 4 ft.) board.

3. Maintain fasteners a minimum of 150 to 305mm (6 to 12 in.) from all perimeters and corners. Provide 50% more fasteners for 2440 mm (8 ft.) perimeters and 75% more at corners for 3660 mm (12 ft.) each way.

4. Ensure fasteners adequately engage and penetrate crest of metal deck 19 mm (3/4 in.). Fasteners that do not engage the substrate, shall be removed and re-installed. Do not overdrive or underdrive fasteners.

5. Install second layer of base insulation and succeeding layers in a full mopping of hot asphalt, applied at a rate of 1.25 kg/m^2 (25 lbs. per square) and embed board into asphalt while still fluid.

6. Base insulation shall be reduced 13 mm (1/2 in.) for 1220 mm (4 ft.) centred at drain sump as noted on drawings. Transition shall be 'shaved' to provide a smooth surface for tapered insulation or overlay board.

7. At junction with wood blocking at parapets, walls and curbs, neatly trim insulation to suit profile of wood assembly and to provide a tight/butt joint.

8. Stagger all joints in insulation boards within each adjacent layer and between lower and upper layers. Walk insulation into hot asphalt to achieve solid bond, immediately after placement.

9. Install insulation boards ensuring panels are tightly butted and end joints between panels are staggered 610 mm (24 in.), each way.

10. Do not lay more insulation/board than can be covered with roof membrane on same day. Insulation, which is damaged by moisture, shall be marked and promptly removed from site.

3.12 Base Insulation - Asphalt

1. Install base layer insulation and succeeding layers in a full mopping of hot asphalt, applied at a rate of 1.25 kg/m^2 (25 lbs. per square) and embed board into asphalt while still fluid. Walk insulation into hot asphalt to achieve solid bond, immediately after placement.

2. Base insulation shall be reduced 13 mm (1/2 in.) for 1220 mm (4 ft.) centred at drain sump as noted on drawings. Transition shall be 'shaved' to provide a smooth surface for tapered insulation or overlay board.

3. At junction with wood blocking at parapets, walls and curbs, neatly trim insulation to suit profile of wood assembly and to provide a tight/butt joint.

4. Stagger all joints in insulation boards within each adjacent layer and between lower and upper layers. Install insulation boards ensuring panels are tightly butted and end joints between panels are staggered 610 mm (24 in.), each way.

5. Do not lay more insulation/board than can be covered with roof membrane on same day. Insulation, which is damaged by moisture, shall be marked and promptly removed from site.

3.13 Base Insulation - Adhesive

1. Insulation, which is damaged by moisture, shall not be used in roof system, be marked and promptly removed from site.

2. Apply base, second and subsequent layers of insulation in adhesive as per Adhesive for Thermal Barrier, Insulation and Overlay Board in this Section.

3. Stagger all joints in insulation boards within each adjacent layer and between lower and upper layers. Install insulation boards ensuring panels are tightly butted and end joints between panels are staggered 610 mm (24 in.), each way.

4. Score and cut boards as required at all undulations in substrate to allow for full contact and full adhesion. At junction with wood blocking at parapets, walls and curbs, neatly trim insulation to suit profile of wood assembly and to provide a tight/butt joint.

5. Base insulation shall be reduced 25 mm (1 in.) for 1220 mm (4 ft.) centred at drain sump or as noted on drawings. Transition shall be 'shaved' to provide a smooth surface for tapered insulation or overlay board.

6. Do not lay more insulation/board than can be covered with roof membrane on same day. Insulation, which is damaged by moisture, shall be marked and promptly removed from site.

3.14 Tapered Insulation - Asphalt

1. Insulation, which is damaged by moisture, shall not be used in roof system, be marked and promptly removed from site.

2. Tapered insulation shall be applied over base insulation and under overlay board in accordance with approved shop drawings.

3. Install tapered insulation, sumps, crickets and backslope in a full mopping of hot asphalt, applied at a rate of 1.25 kg/m^2 (25 lbs. per square), in accordance with reviewed shop drawings and to minimize water ponding.

4. Tapered sump shall be installed in its entirety the same day. Under no circumstance shall sump be installed in more than one application as to build-in a high point within sump area.

5. Install insulation ensuring panels are tightly butted and walk insulation into hot asphalt to achieve solid bond, immediately after placement.

6. Do not lay more insulation than can be covered with roof membrane base sheet on same day.

3.15 Tapered Insulation - Adhesive

1. Tapered insulation shall be applied over base and under overlay board. Insulation, which is damaged by moisture, shall be marked and promptly removed from site.

2. Install tapered insulation, sumps, crickets and backslope in adhesive as per Adhesive for Thermal Barrier, Insulation and Overlay Board in this Section.

3. Insulation shall be immediately placed into liquid and hot asphalt ensuring panels are tightly butted and walk insulation into hot asphalt to achieve solid bond, immediately after placement.

4. Tapered sump shall be installed in its entirety the same day. Under no circumstance shall sump be installed in more than one application as to build-in a high point within sump area.

5. Install insulation ensuring panels are tightly butted and walk insulation into hot asphalt to achieve solid bond, immediately after placement.

6. Do not lay more insulation than can be covered with base sheet / overlay board on same day.

3.16 Overlay Board – In Asphalt

1. Top layer of base/tapered insulation shall be free of rust, dust or any residue that may hinder adherence of the overlay board.

2. Apply overlay board in a full mopping of hot asphalt, applied at a rate of 1.25 kg/m^2 (25 lbs. per square). Embed overlay board into hot asphalt and weigh down / roll into place till good adhesion is attained.

3. Gradually peel back silicone release paper of membrane laps, pressing down on membrane with an aluminum applicator to ensure good contact and adhesion. Heat weld exterior 25 mm (1 in.) edge of side lap with a hot-air gun or torch flame.

4. Where there is no factory lap, seal butt ends with a minimum 305 mm (12 in.) torch grade cover strip over the lap to provide a watertight seal.

5. Stagger side and end joints to underlying insulation joints. Immediately after placement, walk boards into asphalt to achieve solid bond.

6. Do not lay more boards than can be covered with roof membrane base sheet on same day. Boards that are damaged shall be marked and promptly removed from site.

3.17 Overlay Board – In Adhesive

1. Top layer of base/tapered insulation shall be free of rust, dust or any residue that may hinder adherence of the overlay board.

2. Apply overlay board in adhesive as per Adhesive for Thermal Barrier, Insulation and Overlay Board in this Section.

3. Gradually peel back silicone release paper at laps, pressing down on membrane with an aluminum applicator to ensure good contact and adhesion. Roll side and end laps to ensure adequate adhesion in the self-adhesive laps of membrane.

4. Heat weld exterior 25 mm (1 in.) edge of side lap with a hot-air gun or torch flame, where safe. Laps shall be installed to shed water, commencing from low point and working upslope.

5. Where there is no factory lap, seal butt ends with a minimum 305 mm (12 in.) torch grade ‘end lap’ membrane base sheet centred over the lap to provide a watertight seal.

6. Do not lay more boards than can be covered with roof membrane base sheet on same day. Boards that are damaged shall be marked and promptly removed from site.

3.18 Roof Membrane Base Sheet Flashings

General Application Guidelines

1. Torch off poly of underlying membrane base sheet prior to primer application.

2. Apply appropriate primer to surfaces that are to receive membrane flashings at rates recommended by manufacturer. Allow primer to 'flash off' prior to membrane flashing application.

3. Apply membrane base sheet flashings in general conformance with details commencing from low point and working up-slope. Maintain minimum 75 mm (3 in.) side and 150 mm (6 in.) end laps. Laps shall be installed to shed water.

4. Apply base sheet in maximum 1 m (3.25 ft.) wide strips. Extending minimum of 150m (6 in.) beyond toe of cant (or vertical transition) and onto field of roof.

5. At wall and curbs, provide mechanical fasteners within laps of base sheet flashing, prior to applying succeeding sheet. Fasteners shall be installed at maximum 100 mm (4 in.) on centre commencing from 200 mm (8 in.) above roof membrane.

6. Extend modified bituminous base sheet over parapet, perimeter and eaves down outside face of walls 38 mm (1 ½ in.) onto lower substrate. Secure membrane flashing with large head galvanized nails at 150 mm (6 in.) on centre.

7. At exterior face of parapets / perimeters, apply self-adhesive base sheet flashing, to provide continuous cover over exposed wood and joints between substrates as detailed. Overlap self-adhesive base sheet under overhang of membrane base/cap sheet flashings at top edge of parapets / perimeters.

8. Apply base sheet flashings without voids, wrinkles, buckles, fishmouths or any evidence of a lack of full adhesion. Repair defects to satisfaction of *Consultant*.

9. Repair defects in applications with additional piece of self-adhesive base sheet. Carry out repairs to satisfaction of *Consultant.*

Torching Applications

10. **Fully torch base sheet flashing**. Provide 3 mm (1/8 in.) 'bitumen bleed-out' at all side and end laps. Maintain minimum 75 mm (3 in.) side and 150 mm (6 in.) end laps. Stagger side laps from membrane base sheet minimum 350 mm (12 in.).

11. Heat weld exterior 25 mm (1 in.) of all side and end laps providing a 3 mm (1/8 in.) bitumen bleed out. Thoroughly and effectively roll membrane (using manufacturer's recommended steel roller) to attain full contact and adhesion.

Self-Adhesive Applications

12. Apply self-adhesive base sheet flashing into primed surfaces and roll into place with adequate pressure to ensure full contact and adhesion with substrate. Membrane must be rolled into place using manufacturer's approved roller.

13. Peel back 100 to 150 mm (4 to 6 in.) of the silicone release paper to hold the membrane in place. Gradually peel back remaining silicone release paper, pressing down on membrane with an aluminum applicator to ensure good contact and adhesion.

14. Heat weld exterior 25 mm (1 in.) of all side and end laps providing a 3 mm (1/8 in.) bitumen bleed out. All side and end laps shall be 'buttered'.

15. Thoroughly and effectively roll membrane (using manufacturer's recommended steel roller) to attain full contact and adhesion.

3.19 Reinforcement Gussets

1. Apply gussets at every angle, on inside and outside corners in accordance with manufacturer's requirements.

2. Install self-adhesive or thermofusible gussets before application of membrane base sheet flashing,

3.20 Roof Membrane Cap Sheet

1. Membrane base sheet application shall be reviewed by *Manufacturer* and *Consultant* prior to proceeding with membrane cap sheet.

2. Unroll membrane on roof surface and allow to relax minimum 15 minutes or as required depending on weather conditions. Position in desired location, commencing from low point working upslope. Membrane may also be relaxed by applying heat to the poly top surface in a 'zig-zag' pattern to release the ploy tension on the membrane.

3. Apply membrane cap sheet commencing with drain centred in mid-span of membrane sheet or low end and working upslope. Fully torch cap sheet to base sheet and extend to edge of perimeter, after base sheet flashing has been completed.

4. Provide 3 mm (1/8 in.) 'bitumen bleed-out' at all side and end laps. Maintain minimum 75 mm (3 in.) side and 150 mm (6 in.) end laps. Laps shall be installed to shed water.

5. Maintain minimum 50% stagger from base sheet. Use chalklines to maintain neat and straight lines. Do not walk on or step into newly applied membrane. Under no circumstance shall a side or end lap be less than 305 mm (12 in.)

6. Apply loose granules in areas where excess heat welding has occurred. Apply heat to affected area, place granules and embed them into warm membrane.

7. Apply membrane cap sheet without voids, wrinkles, buckles, fishmouths or any evidence of a lack of full adhesion. Repair defects to satisfaction of *Consultant*.

3.21 Roof Membrane Cap Sheet Flashings

1. Apply membrane cap sheet flashings in general conformance with details commencing from low point and working up-slope.

2. Membrane base sheets/flashings with a poly on top face shall have poly burned off prior to applying cap sheet flashings. Maintain minimum 50% stagger from base sheet flashing. Use chalklines to maintain neat and straight lines. Do not walk on or step into newly applied membrane.

3. Fully torch modified bituminous cap sheet flashing to attain full bond.

4. Terminate cap sheet 13 mm (1/2 in.) back from outside edge of parapet blocking and past base sheet flashing 50 mm (2 in) onto flat of roof.

5. Provide 3 mm (1/8 in.) bleed out at all side laps. Maintain minimum 75 mm (3 in.) side and 150 mm (6 in.) end laps. Laps shall be installed to shed water.

6. At wall terminations, install and secure termination bar to adequately restrain the flashings. Secure termination bar at maximum 305 mm (12 in.) on centre. Apply sealant bead along entire length of termination bar.

7. Repair defects in applications with additional piece of torch grade base sheet. Carry out repairs to satisfaction of Consultant.

3.22 Drains

1. At drain locations, install 1220 x 1220 mm (4 x 4 ft.) protection board in lieu of overlay board. Shave perimeter of overlay board to provide smooth transition.

2. Cut opening through membrane base sheet, insulation, thermal barrier, vapour retarder and centre drain over pipe. Apply mastic on underside of flange.

3. Insert drain body into new rain water leader until flange is flush with roof membrane. Secure new drains with mechanical (MJ) connection and underside with deck clamp.

4. Flash drain flange with one ply of torch grade base sheet. Extend membrane a minimum of 305 mm (12 in.) beyond the edge of drain flange. Membrane cap sheet to be extended continuously through drain area.

5. Install clamping ring and aluminum strainer over raised bosses and install screws to tighten ring against membrane and flashings until secure.

6. Ensure roof drains are clear of debris and free draining at project completion.

3.23 Sleeves

1. Provide all required vents, stacks and conduit sleeves and supports to suit site conditions.

2. At existing vent pipes, extend pipe with same material to 25 mm (1 in.) above top edge of sleeve. At existing exhaust stacks, extend pipe as required to allow for rain collar installation.

3. Prime stack flanges, top and bottom and set underside of flange in bed of mastic on membrane and position evenly around projection.

4. Flash in flanges with one ply of torch grade base sheet. Extend membrane a minimum of 305 mm (12 in.) beyond the edge of drain flange.

5. Where stacks are installed on top of curbs, entire 'boxed curb' shall be covered with adequately secured overlay board and completely covered with torch grade membrane base sheet and cap sheet.

3.24 Parapets/Perimeters/Walls/Sleepers/Curbs

1. Provide 2-ply membrane flashings over all sleepers to fully encapsulate wood and in accordance with this section.

2. Construct parapet, perimeters, wall and curbs as detailed with new wood framing in accordance with Section 06 10 11 – Rough Carpentry.

3. Provide 2-ply membrane flashings at all noted locations in accordance with this section and as detailed.

4. Provide metal cap flashings at sleepers and curbs prior to installing units.

3.25 Dividers/Movement/Control Joints

1. At all roof dividers, movement and control joints, construct as detailed with new wood framing in accordance with Section 06 10 11 – Rough Carpentry.

2. At tie-ins with existing and adjacent roof areas, extend new membrane flashings onto existing side as detailed.

3. Provide 2-ply membrane flashings at all noted locations in accordance with this section and as detailed.

3.26 Overflow Scuppers

1. Walls will have to be saw-cut, boxed in with plywood sheathing and membrane base sheet flashing prior to installing scupper. Allow for required rough opening.

2. Where indicated on drawings, install new scuppers and secure to substrate. Scuppers shall be set no higher than 50 mm (2 in.) above lowest point of roof area.

3. Flash in scupper flanges with one-ply of self-adhesive torch grade base and one ply torch grade cap sheet.

3.27 Storm Collars

1. Install storm collars complete with clamping ring and sealant over stacks where caps cannot be installed.

3.28 Pitch – Pans

1. New pitch-pans are to be provided at penetrations where specified sleeves are not suitable and shall be approved by *Consultant.*

2. All surfaces shall be clean dry and free from all deleterious material. Galvanized metal penetrations and painted metal must be prepared using a grinding machine to bare metal. PVC pipe must be sanded with sandpaper.

3. All metal surfaces and the pitch-pan pocket must be cleaned with non-greasy solvent such as acetone or Methyl Ethyl Ketone (MEK).

4. Place pitch-pan pocket at desired location and mark outside edge for reference. Pitch pocket shall be placed with minimum 25 mm (1 in) clearance from inside of pitch pocket and penetration.

5. Seal base of penetration with sealant to prevent potential of mastic flowing through openings. Apply sealant over entire granulated surface of membrane where pitch pocket will be installed, to avoid any water infiltration between pitch pocket and membrane.

6. Position pitch-pan pocket and apply a liberal bead of sealant at outside perimeter of pitch pocket. Use the tip of a trowel to adhere sealant to the membrane.

7. Dispense an initial amount of mastic (equivalent to half of the nozzle), outside of the pitch pocket, to assure a homogeneous mixture of parts A and B.

8. Fill assembled pitch pocket with mastic until full, with a high point at middle and tapered to outside edge to allow for water flow over pitch-pocket.

3.29 Precast Pavers

1. Install new precast paver to required layout. Saw cut to fit at corners/walls or core hole where required to fit penetrations and field dimensions. No piece shall be smaller than 150 mm (6 in.) x 610 mm (2 ft.).

2. Set pavers on pedestals and adequately balance pavers so that ‘rocking’ does not occur. Pedestal shall be minimum 150 mm (6 in.) wide by 205 mm (12 in.) long. Maintain continuous drainage under all pavers.

3.30 Quality Control

1. *Owner* may retain an independent *Consultant* to carry out periodic supervision during construction.

2. If requested by *Consultant*, take cut-test samples of roofing membrane and membrane flashings, wrap and label samples, identify locations and submit to *Consultant* for review and testing.

3. *Contractor* shall make an allowance for minimum of one cut test per day and all required patching to match existing assembly. Samples must be a minimum 305 x 305 mm (12 x 12 in.) and include all new roof components including asphalt pour and gravel.

4. Failed test results will require remedial work acceptable to *Consultant* and may entail complete removal and replacement of failed areas.

3.31 Clean-up

1. Remove all excess materials, debris, tools and equipment as work proceeds and on completion, or sooner if requested by *Consultant*. Remove all stains, asphalt, caulking or other adhesive from all surfaces.

End of Section 07 52 16

1. GENERAL

1.1 Section Includes

1. Section includes for provision of all labour, materials, equipment and services for sheet metal flashing and trim Work in accordance with Contract Documents.

1.2 Related Sections

1. Section 06 10 00 Rough Carpentry
2. Section 07 52 16 SBS Modified Bituminous Membrane Roofing
3. Section 07 92 00 Joint Sealers

1.3 References

1. Sheet Metal and Air Conditioning Contractors' National Association, Inc. (SMACNA) – Architectural Sheet Metal Manual
2. ASTM A 525M, Standard Specification for Sheet Steel, Zinc Coated (Galvanized) by the Hot Dipped Process, General Requirements.
3. Canadian Roofing Contractors Association (CRCA) – Specification Manual
4. Canadian Sheet Steel Building Institute (CSSBI) Bulletin No. 9, Core and Maintenance of Pre-finished Sheet Steel Building Products.

1.4 Operations

1. Perform operations, at times designated by the *Owner*, that will not adversely affect occupants of building and operations in and around site access and egress.

1.5 Protection

1. Protect work of this section from damage. Damaged work which cannot be satisfactorily repaired, restored or cleaned, shall be replaced at no cost to *Owner*.

1.6 Submittals

1. Submit samples of flashing and sheet metal type and colour to *Consultant* and *Owner* for review prior to commencing work.

1.7 Mock-Up

1. Fabricate mock-ups in minimum 2440 mm (8 ft.) lengths with reviewed materials, approved methods including, joints, seams, expansion joints, starter strips and fasteners.
2. Mock-up, if accepted, shall represent the minimum standard for work. Mock-up may be included as part of final work

1.8 Quality Assurance

1. Flashing and Sheet Metal Work shall be executed in accordance with SMACNA Architectural Sheet Metal Manual – recent edition, by skilled trades having a minimum of five (5) years related experience.

1.9 Warranty

1. Provide minimum two (2) year Warranty from date of Substantial Performance, as certified by *Consultant*. Warranty shall be submitted against defects in workmanship and materials.

2. *Contractor* must extend the Warranty on replaced parts and workmanship for a period of two (2) years from date of acceptance of replacement parts and workmanship. Defects will include but will not be limited to leaking, failure to stay in place, lifting, deformation and breaking of weathertight seals.

3. Provide all additional Warranties that may be available from manufacturer.

2. PRODUCTS

2.1 Material

1. Prefinished steel sheet: Galvanized steel, 0.71 mm (24 gauge) core nominal thickness, conforming to ASTM A525, Z275 zinc coated (galvanized) to designation G90 by the hot dip process, with a prefinished coat. Profiles as detailed.

2. Precoat Finish: Perspectra Plus Series, factory applied coating. Colour to be approved by *Owner* from standard colours listed in General Colour Card.

    1. Four standard (4) colours – to be selected from full colour selection by architect.

3. Starter strips: Fabricated from prefinished steel sheet, 0.87 mm (22 gauge) core nominal thickness. Minimum 75 mm (3 in.) wide face or as detailed and to be continuous.

4. Termination Bar: 3 mm x 25 mm (1/8 x 1 in.) extruded aluminum bar.

5. Touch-up paint: As supplied and recommended by sheet steel manufacturer.

6. Exposed Sheet Metal Fasteners: Self-Drilling Hex Head with washer and colour coded cap.

7. Cap, Counter and Fascia Metal to be fabricated to layouts and details shown on drawings and to extent required.

8. Overflow Scuppers: Overflow (Where Shown on Drawings): Fabricated from 0.71 mm (24 gauge) stainless steel. To be a minimum 200 mm wide x 100 mm high (8 x 4 in.) with continuously soldered seams with a 150 mm (6 in.) wide apron/flanges.

9. Fasteners: In accordance with Section 06 10 00 – Rough Carpentry

10. Sealants: In accordance with Section 07 92 00 – Joint Sealers

3. EXECUTION

3.1 Fabrication

1. Shop fabricate flashing, sheet metal and trim in accordance with requirements of SMACNA and the Contract Documents. Form sheet metal on bending brake, shaping, trimming and hand seaming on bench.

2. Form sections square, true, and accurate to size. Flashings shall be free from distortion, oil canning, twists, buckles, discolouration and other defects detrimental to appearance and performance.

3. Double back all edges a minimum of 13 mm (1/2 in.). Raw cut-edges are not acceptable.

4. Form joints with S-locks and make allowances for movement. Mitre and form standing seams at all corners. Make allowance for movement at joints.

5. Fabricate cap flashings, counter flashings and starter strips to details shown and where required.

6. Fabricate metal in 2400 mm (8 ft.) maximum lengths with an unbroken face less than 225 mm (9 in.). Form flashings with an exposed unbroken face exceeding 225 mm (9 in.) and a girth greater than 610 mm (24 in.) in 1220 mm (4 ft.) maximum lengths.

7. Provide horizontal stiffening rib "V" on all face metal exceeding 225 mm (9 in.) in girth and where shown on drawings.

8. Provide an 'S-Lock' joint at all end joints and at all horizontal joints between the cap flashing and the vertical flashing and between the vertical flashing and base counter flashing.

9. Where soldered joints are absolutely necessary and where approved for use in prepainted metal, clean paint off both surfaces before soldering for minimum area necessary.

10. Exposed sheet metal coming in contact with a metal of a different type must be back painted with two (2) coats of isolation coating.

3.2 Sheet Metal Flashing and Trim

1. Provide a continuous starter strip on exterior side for all metal cap, fascia and counter flashings and secure at a maximum 305 mm (12 in.) on centre with flat headed screws.

2. Install flashings and sheet metal that includes but not limited to; cap flashings, counter flashings, curb and sleeper counter flashings, starter strips and other miscellaneous trim work in accordance with Contract Documents.

3. Parapet and perimeter cap flashings shall be installed with a **minimum 10% positive slope** to interior of roof. Slope to be provided by installation of continuous wood shims, plywood and wood blockings as detailed and in accordance with Section 06 10 00 – Rough Carpentry.

4. Saw cut new reglet, minimum 13 mm high x 25 mm deep (1/2 in. x 1 in.) into masonry surfaces to accommodate installation of sheet metal counter flashings.

5. Return top edge of metal counter flashings into reglet 19 mm (3/4 in.). Secure flashings with pin grips spaced at maximum 305 mm (12 in.) on centre and apply sealant bead to shed water.

6. Install sheet metal work with concealed fasteners. Install exposed fasteners only when and where permitted by *Consultant*. Install fasteners in an approved manner as to prevent water penetration at point of fastening and to be evenly and neatly distributed.

7. Provide continuous termination bar at top edge of membrane flashings. Fasten termination bar to substrate at a maximum 305 mm (12 in.) on centre with appropriate and approved fasteners. Top edge of counter flashing shall be inserted under cap flashings.

8. Fasteners are to be located minimum of 305 mm (12 in.) above roof membrane – where possible.

9. End joints of adjacent lengths shall be completed using 'S-Lock' joints. This shall be accomplished by inserting end of one length in a 25 mm (1 in.) deep "S" lock formed in end of adjacent length. Concealed portion of "S" lock shall extend 25 mm (1 in.) outwards and shall be secured to substrate with flat head screws at 100 mm (4 in.) on centre.

10. Provide three (3) exposed fasteners on interior side of cap flashing, evenly spaced at 610 mm (24 in.) per 2400 mm (8 ft.) length. Use colour ceded screws with washers.

3.3 Overflow Scuppers

1. Where indicated on drawings, install new scuppers and secure to substrate. Overflow scuppers shall be set no higher than 50 mm (2 in.) above lowest point of roof area.

2. Flash in scupper flanges in accordance with Section 07 52 16 SBS Modified Bituminous Membrane Roofing

3.4 Clean-up

1. Remove all excess materials, debris, tools and equipment as work proceeds and on completion, or sooner if requested b *Consultant*.

End Of Section 07 62 00

Part 1 General

1.1 REFERENCES

.1 Underwriters Laboratories of Canada (ULC)

.1 CAN/ULC-S101, 1989.

.2 CAN/ULC-S102, 1988.

1.2 TEST REPORTS

.1 Submit product data including certified copies of test reports verifying fireproofing applied to substrate as constructed on project will meet or exceed requirements of Specification.

.2 Submit test results in accordance with CAN/ULC-S101 for fire endurance and CAN/ULC-S102 for surface burning characteristics.

.3 For assemblies not tested and rated, submit proposals based on related designs using accepted fireproofing design criteria.

1.3 SAMPLES

.1 Submit samples in accordance with Section 01 33 00 - Submittal Procedures.

.2 Submit duplicate 300 x 300 mm size sample of exposed fireproofing for approval of texture and colour.

1.4 PROTECTION

.1 At outdoor temperatures less than 5EC, ensure that a 5EC air and substrate temperature is maintained during and for 24 hours after application. Ensure that natural ventilation to properly dry the fireproofing during and subsequent to its application is provided. In enclosed areas lacking openings for natural ventilation, ensure that interior air is circulated and exhausted to the outside.

.2 Provide temporary enclosures to prevent spray from contaminating air beyond application area.

.3 Protect adjacent surfaces and equipment from damage by overspray, fall-out, and dusting of fireproofing materials.

Part 2 Products

2.1 MATERIALS

.1 **Sprayed fireproofing**: ULC certified cementitious or fireproofing qualified for use in ULC Designs to provide 1 hour fire resistance rating to **all floor supporting structural**

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steel members. Contractor to state ULC Design compliance in data submissions in accordance with Section 01 33 00 – Submittals.

.1 Acceptable Material: "W.R. GRACE", Type MK-6.

.2 Acceptable Material: "CAFCO/ISOLATEK INTERNATIONAL" Type 300.

.3 Acceptable Material: AD Fire Protection systems, AD Type 5.

.2 Curing compound: type recommended by fireproofing manufacturer, qualified for use in ULC Designs specified.

.3 Primer: As required by ULC design where applicable, or as recommended by AD Fire Protection Systems.

Part 3 Execution

3.1 PREPARATION

.1 Discuss fireproofing methods and final product with principal building inspector prior to application to ensure that finished installation will be acceptable. Record in writing all materials and methods to be employed to achieve final approval of installation.

.2 Contractor to prepare a mock-up of the fireproofing on site. Architect and GC to review to determine if level of finish is acceptable.

.3 Substrate shall be free of material, which would impair bond.

.4 Verify that painted substrate [s] are compatible and have suitable bonding characteristics to receive fireproofing.

.5 Remove incompatible materials.

.6 Ensure that items required to penetrate fireproofing are placed before installation of fireproofing.

.7 Ensure that ducts, piping, equipment, or other items which would interfere with application of fireproofing are not positioned until fireproofing work is completed.

3.2 APPLICATION

.1 Apply bonding adhesive or primer to substrate if recommended by manufacturer.

.2 Apply fireproofing to correspond with tested assemblies, or acceptable calculation procedures to provide following fire resistance ratings.

.3 Apply fireproofing over substrate, building up to required thickness to cover substrate with monolithic blanket of uniform density and texture.

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3.3 INSPECTION AND SITE TESTS

.1 Inspection and testing of fireproofing will be carried out by a third party agency designated by Consultant.

.2 Cost of testing will be paid from Cash Allowance specified in Section 011100 – Summary of Work, section 1.29.

.3 Arrange for final inspection of the work of this section by municipal building inspector.

3.4 PATCHING

.1 Patch damage to fireproofing caused by testing or by other trades before fireproofing is concealed, or if exposed, before final inspection.

3.5 LOCATIONS- SPRAYED FIREPROOFING

.1 Fireproofing is required on all structural steel supporting floor loads. Refer to structural drawings.

END OF SECTION

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Part 1 General

1.1 RELATED WORK

.1 Fire stopping and smoke seals within mechanical assemblies (i.e. inside ducts, dampers) and electrical assemblies (i.e. inside cable trays) are specified in Division 26 and 33 respectively.

1.2 REFERENCES

.1 Underwriters Laboratories of Canada (ULC)

.1 ULC-S115-[1995], Fire Tests of Firestop Systems.

1.3 SAMPLES

.1 Submit samples in accordance with Section 01 33 00 - Submittal Procedures.

.2 Submit duplicate 300 x 300 mm samples showing actual firestop material proposed for project.

1.4 PRODUCT DATA

.1 Submit product data in accordance with Section 01 33 00 - Submittal Procedures.

.2 Submit manufacturer's product data for materials and prefabricated devices, providing descriptions are sufficient for identification at job site. Include manufacturer's printed instructions for installation.

1.5 WASTE MANAGEMENT AND DISPOSAL

.1 Collect and separate plastic, paper packaging and corrugated cardboard in accordance with Waste Management Plan.

1.6 SYSTEM DESCRIPTION

.1 Firestopping Materials: CAN4-S115M ASTM E814 to achieve a fire protection rating as noted on Drawings.

.2 It is the intent of this Section that in conjunction with Divisions 26 and 33 a competent, single source be responsible for the firestopping and smoke seals of the entire project.

1.7 QUALITY ASSURANCE

.1 Manufacturer: Company specializing in manufacturing products of this Section with minimum five years documented experience.

.2 Applicator: Approved, licensed and supervised by the manufacturer of firestopping materials. Company with minimum five years documented experience.

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.3 Product: Manufactured under ULC Follow-up Program. Each container or package shall bear ULC label.

1.8 REGULATORY REQUIREMENTS

.1 Conform to applicable code for fire protection ratings.

.2 Provide certificate of compliance for authority having jurisdiction indicating approval.

1.9 DELIVERY, STORAGE AND HANDLING

.1 Deliver and store materials in a dry, protected area, off ground in original, undamaged, sealed containers with manufacturer's labels and seas intact.

1.10 PROJECT AND SITE CONDITIONS

.1 Application temperature and ventilation as per Manufacturer's instructions.

1.11 SEQUENCING AND SCHEDULING

.1 Sequence work to permit installation of firestopping and smoke seal materials to be installed after adjacent work is complete and before closure of spaces.

Part 2 Products

2.1 MATERIALS

.1 A/D Firebarrier Firestop Systems, by A/D Fire Protection Systems Inc., capable of maintaining an effective barrier against flame, smoke and gases in compliance with requirements of CAN4-S115 and not to exceed opening sizes for which they are intended.

.2 Mineral Wood Backing Insulation: ULC labeled, preformed non-combustible material (A/D Firebarrier Mineral Wool) by A/D Fire Protection Systems Inc.

.3 Retainers: Clips to support mineral wool.

.4 Firestopping Sealant: ULC labeled, single component silicone bases, A/D Silicone Firebarrier Sealant by A/D Fire Protection Systems Inc.

.5 Firestopping Seal: ULC labeled, single component water-base seal, A/D Firebarrier Seal by A/D Fire Protection Systems Inc.

.6 Firestopping Foam: ULC labeled, two components silicone foam, A/D Firebarrier RTV Foam by A/D Fire Protection Systems Inc.

.7 Firestopping Mortar: ULC labeled, non-combustible fibre reinforced, foamed cement mortar, A/D Firebarrier Mortar by A/D Fire Protection Systems Inc.

.8 Damming Material: In accordance with tested assembly being installed as applicable and as acceptable to authorities having jurisdiction.

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Part 3 Execution

3.1 PREPARATION

.1 Examine sizes and conditions of voids to be filled to establish correct thicknesses and installation of materials. Ensure that substrates and surfaces are clean, dry and frost free.

.2 Prepare surfaces in contact with fire stopping materials and smoke seals to manufacturer's instructions.

.3 Maintain insulation around pipes and ducts penetrating fire separation without interruption to vapour barrier.

.4 Mask where necessary to avoid spillage and over coating onto adjoining surfaces; remove stains on adjacent surfaces.

.5 Verify that openings are ready to receive the Work of this Section.

.6 Confirm compatibility of surfaces to receive firestopping and smoke seal materials.

.7 Beginning of installation means acceptance of existing surfaces and substrate.

3.2 INSTALLATION

.1 Install fire stopping and smoke seal material and components in accordance with ULC certification and manufacturer's instructions.

.2 Seal holes or voids made by through penetrations, poke-through termination devices, and unpenetrated openings or joints to ensure continuity and integrity of fire separation are maintained.

.3 Provide temporary forming as required and remove forming only after materials have gained sufficient strength and after initial curing.

.4 Tool or trowel exposed surfaces to a neat finish.

.5 Remove excess compound promptly as work progresses and upon completion.

.6 Apply in sufficient thickness to achieve rating to uniform density and texture.

.7 Protect installed material until cured or set.

3.3 INSPECTION

.1 Notify Consultant when ready for inspection and prior to concealing or enclosing firestopping materials and service penetration assemblies.

3.4 SCHEDULE

.1 Firestop and smoke seal at:

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.1 Penetrations through fire-resistance rated masonry, concrete, and gypsum board partitions and walls.

.2 Top of fire-resistance rated masonry and gypsum board partitions.

.3 Intersection of fire-resistance rated masonry and gypsum board partitions.

.4 Control and sway joints in fire-resistance rated masonry and gypsum board partitions and walls.

.5 Penetrations through fire-resistance rated floor slabs, ceilings and roofs.

.6 Openings and sleeves installed for future use through fire separations.

.7 Around Mechanical and Electrical assemblies penetrating fire separations.

.8 Refer to Drawings for horizontal and vertical fire stop locations and for typical firestopping detail at cavity wall, for top of wall fire separation assembly and for fire separation locations.

3.5 CLEAN UP

.1 Remove excess materials and debris and clean adjacent surfaces immediately after application.

.2 Remove temporary dams after initial set of fire stopping and smoke seal materials.

END OF SECTION

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Part 1 General

1.1 SECTION INCLUDES

.1 Materials, preparation and application for caulking and sealants.

1.2 RELATED SECTIONS

.1 Section 01 33 00 - Submittal Procedures.

.2 Section 07 62 00 – Sheet Metal Flashing and Trim.

.3 Section 08 11 14 – Steel Doors and Frames.

.4 Section 04 21 13 - Masonry.

.5 Section 07 46 13 – Preformed Metal Siding.

1.3 REFERENCES

.1 American Society for Testing and Materials International, (ASTM)

.1 ASTM C919-[02], Standard Practice for Use of Sealants in Acoustical Applications.

.2 Canadian General Standards Board (CGSB)

.1 CGSB 19-GP-5M-[1984], Sealing Compound, One Component, Acrylic Base, Solvent Curing (Issue of 1976 reaffirmed, incorporating Amendment No. 1).

.2 CAN/CGSB-19.13-[M87], Sealing Compound, One-component, Elastomeric, Chemical Curing.

.3 CGSB 19-GP-14M-[1984], Sealing Compound, One Component, Butyl-Polyisobutylene Polymer Base, Solvent Curing (Reaffirmation of April 1976).

.4 CAN/CGSB-19.17-[M90], One-Component Acrylic Emulsion Base Sealing Compound.

.5 CAN/CGSB-19.24-[M90], Multi-component, Chemical Curing Sealing Compound.

.3 Department of Justice Canada (Jus)

.1 Canadian Environmental Protection Act, 1999 (CEPA).

.4 General Services Administration (GSA) - Federal Specifications (FS)

.1 FS-SS-S-200-[E(2)1993], Sealants, Joint, Two-Component, Jet-Blast-Resistant, Cold Applied, for Portland Cement Concrete Pavement.

.5 Health Canada/Workplace Hazardous Materials Information System (WHMIS)

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.1 Material Safety Data Sheets (MSDS).

.6 Transport Canada (TC)

.1 Transportation of Dangerous Goods Act, 1992 (TDGA).

1.4 SUBMITTALS

.1 Submit product data in accordance with Section 01 33 00 - Submittal Procedures.

.2 Manufacturer's product to describe.

.1 Caulking compound.

.2 Primers.

.3 Sealing compound, each type, including compatibility when different sealants are in contact with each other.

.3 Submit manufacturer's instructions in accordance with Section 01 33 00 - Submittal Procedures.

.1 Instructions to include installation instructions for each product used.

1.5 DELIVERY, STORAGE, AND HANDLING

.1 Deliver, handle, store and protect materials in accordance with Section 01 61 00 - Common Product Requirements.

.2 Deliver and store materials in original wrappings and containers with manufacturer's seals and labels, intact. Protect from freezing, moisture, water and contact with ground or floor.

1.6 WASTE MANAGEMENT AND DISPOSAL

.1 Remove from site and dispose of packaging materials at appropriate recycling facilities.

.2 Collect and separate for disposal of paper, plastic, polystyrene, corrugated cardboard, or packaging material [in appropriate on-site bins] for recycling.

.3 Place materials defined as hazardous or toxic in designated containers.

.4 Handle and dispose of hazardous materials in accordance with the CEPA, TDGA, Regional and Municipal regulations.

.5 Unused [sealant] material must not be disposed of into sewer system, into streams, lakes, onto ground or in other location where it will pose health or environmental hazard.

.6 Divert unused joint sealing material from landfill to official hazardous material collections site approved by Consultant.

.7 Empty plastic joint sealer containers are not recyclable. Do not dispose of empty containers with plastic materials destined for recycling.

.8 Fold up metal banding, flatten, and place in designated area for recycling.

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1.7 PROJECT CONDITIONS

.1 Environmental Limitations:

.1 Do not proceed with installation of joint sealants under following conditions:

.1 When ambient and substrate temperature conditions are outside limits permitted by joint sealant manufacturer or are below 4.4 degrees C.

.2 When joint substrates are wet.

.2 Joint-Width Conditions:

.1 Do not proceed with installation of joint sealants where joint widths are less than those allowed by joint sealant manufacturer for applications indicated.

.3 Joint-Substrate Conditions:

.1 Do not proceed with installation of joint sealants until contaminants capable of interfering with adhesion are removed from joint substrates.

1.8 ENVIRONMENTAL REQUIREMENTS

.1 Comply with requirements of Workplace Hazardous Materials Information System (WHMIS) regarding use, handling, storage, and disposal of hazardous materials; and regarding labelling and provision of Material Safety Data Sheets (MSDS) acceptable to Labour Canada.

.2 Conform to manufacturer's recommended temperatures, relative humidity, and substrate moisture content for application and curing of sealants including special conditions governing use.

1.9 WARRANTY

.1 Submit a warranty that caulking work will not leak, crack, crumble, melt, shrink, run, lose adhesion or stain adjacent surfaces, in accordance the General Conditions of the Contract, but for two (2) years total. Contractor shall supply all labour, materials, tools and equipment to repair and/or replace any work judged to be defective by the Consultant and sealant manufacturer at no additional cost to the owner for a period of 2 years from the date of Substantial Completion.

.2 Submit a manufacturer’s warranty against defects in materials and workmanship covering the components of the sealant for a period of ten (10) years. The manufacturer shall supply a non-pro-rated warranty covering labour, materials, tools and equipment to repair and/or replace any materials defects at no additional cost, for a period of 10 years

Part 2 Products

2.1 SEALANT MATERIALS

.1 Do not use caulking that emits strong odours, contains toxic chemicals or is not certified as mould resistant in air handling units.

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.2 When low toxicity caulks are not possible, confine usage to areas which off gas to exterior, are contained behind air barriers, or are applied several months before occupancy to maximize off gas time.

.3 Where sealants are qualified with primers use only these primers.

2.2 SEALANT MATERIAL DESIGNATIONS

.1 Primers: type recommended by sealant manufacturer.

.2 Joint Fillers:

.1 General: compatible with primers and sealants, outsized 30 to 50%.

.2 Polyethylene, urethane, neoprene or vinyl: extruded closed cell foam, Shore A hardness 20, tensile strength 140 to 200 kPa.

.3 Neoprene or butyl rubber: round solid rod, Shore A hardness 70.

.4 Polyvinyl chloride or neoprene: extruded tubing with 6 mm minimum thick walls.

.5 Bond breaker: pressure sensitive plastic tape which will not bond to sealants.

.6 Sealant Type A: One component, chemical curing, conforming to CAN2-19.13-M82, Class C-2-25-B-N; multi-component, chemical curing, conforming to CAN2-19.24-M80, Type 2, Class B.

.7 Sealant Type B: Multi-component, chemical curing mildew resistant conforming to CGSB 19-GP-22M.

.8 Sealant type C: Multi-component, acrylic emulsion base, conforming to CGSB 19-GP-17M.

.9 Sealant type D: One component, polyurethane base, chemical curing, conforming to CAN2-19.13-M82, Class C-1-25-B-N; or multi-component, chemical curing, conforming to CAN2-19.24-M80, type 1.

.10 For exterior aluminum to masonry, aluminum to wood and aluminum to metal joints: high performance, single component modified elastomeric joint sealant conforming to CAN2-19.24-M80. Acceptable Materials: Sonolastic Ultr*a* by Degussa.

.11 For interior aluminum to masonry, aluminum to wood and aluminum to metal joints: high performance, single component low odour sealant conforming to CAN/CGSB-19.13-M87. Acceptable materials: Spectrem 2 by Tremco.

.3 Color of Sealants: to be selected by Consultant. Allow for a total of two (2) colours for Type A, two colours for Type B, two colours for Type C and one colour for Type D. Locations as directed on site by Consultant.

.4 Joint cleaner: xylol, methylethyl-ketone or non-corrosive type recommended by sealant manufacturer and compatible with joint forming materials.

.5 Vent tubing: 6 mm inside diameter extruded polyvinyl chloride tubing.

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2.3 JOINT CLEANER

.1 Non-corrosive and non-staining type, compatible with joint forming materials and sealant recommended by sealant manufacturer.

.2 Primer: as recommended by manufacturer.

Part 3 Execution

3.1 PROTECTION

.1 Protect installed Work of other trades from staining or contamination.

3.2 SURFACE PREPARATION

.1 Examine joint sizes and conditions to establish correct depth to width relationship for installation of backup materials and sealants.

.2 Clean bonding joint surfaces of harmful matter substances including dust, rust, oil grease, and other matter which may impair Work.

.3 Do not apply sealants to joint surfaces treated with sealer, curing compound, water repellent, or other coatings unless tests have been performed to ensure compatibility of materials. Remove coatings as required.

.4 Ensure joint surfaces are dry and frost free.

.5 Prepare surfaces in accordance with manufacturer's directions.

3.3 PRIMING

.1 Where necessary to prevent staining, mask adjacent surfaces prior to priming and caulking.

.2 Prime sides of joints in accordance with sealant manufacturer's instructions immediately prior to caulking.

3.4 BACKUP MATERIAL

.1 Apply bond breaker tape where required to manufacturer's instructions.

.2 Install joint filler to achieve correct joint depth and shape, with approximately 30% compression.

3.5 MIXING

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

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3.6 APPLICATION

.1 New Work:

.1 Remove dust, paint, loose mortar and other foreign matter. Dry joint surfaces.

.2 Remove rust, mill scale and coatings from ferrous metals by wire brush, grinding or sandblasting.

.3 Remove oil, grease and other coatings from non-ferrous metals with joint cleaner.

.4 Prepare concrete, masonry, glazed and vitreous surfaces to sealant manufacturer's instructions.

.5 Examine joint sizes and correct to achieve depth ratio 1/2 of joint width with minimum width and depth of 6 mm, maximum width 25 mm.

.6 Install joint filler to achieve correct joint depth.

.7 Where necessary to prevent staining, mask adjacent surfaces prior to priming and caulking.

.8 Apply bond breaker tape where required to manufacturer's instructions.

.9 Prime sides of joints to sealant manufacturer's instructions immediately prior to caulking.

.2 Sealant.

.1 Apply sealant in accordance with manufacturer's written instructions.

.2 Mask edges of joint where irregular surface or sensitive joint border exists to provide neat joint.

.3 Apply sealant in continuous beads.

.4 Apply sealant using gun with proper size nozzle.

.5 Use sufficient pressure to fill voids and joints solid.

.6 Form surface of sealant with full bead, smooth, free from ridges, wrinkles, sags, air pockets, embedded impurities.

.7 Tool exposed surfaces before skinning begins to give slightly concave shape.

.8 Remove excess compound promptly as work progresses and upon completion.

.9 Apply sealant to joints between window or door frames to adjacent building components around perimeter of every external window or door opening, to control joints in masonry walls and where indicated. In masonry cavity construction, vent caulked joints from cavity to 3 mm beyond external face of wall by inserting vent tubing at bottom of each joint and maximum to 1500 mm o.c. vertically. Position tube to drain to exterior.

.10 Apply sealant to close gaps at all junctures of all interior walls meeting exposed ceilings. Provide required foam backer rods to ensure integrity of sealant bead when applied to juncture. Tool finish smooth to receive paint finish.

.11 Use sealants specified in the following locations:

.1 Type A: Joints between windows or door frames and adjacent building components; control and expansion joints and all other locations where sealing is required, except in locations designated for Type B, C and D. Ensure that sealant chosen (from the several specified under

"MATERIALS") for each location is recommended by manufacturer for use on surfaces encountered.

.2 Type B: Joints between splash backs and walls.

.3 Type C: Joints between interior metal door frames and partitions.

.4 Type D: Joints in horizontal surfaces between concrete slabs.

.3 Curing.

.1 Cure sealants in accordance with sealant manufacturer's instructions.

.2 Do not cover up sealants until proper curing has taken place.

.4 Cleanup.

.1 Clean adjacent surfaces immediately and leave Work neat and clean.

.2 Remove excess and droppings, using recommended cleaners as work progresses.

.3 Remove masking tape after initial set of sealant.

3.7 WORK INCLUDED

.1 Work shall include but not limited to the following areas:

.1 exterior and interior hollow metal frames and screens; both sides;

.2 exposed control and expansion joints in masonry walls, masonry corners, joints in front of steel lintels bearing on exterior brick jambs;

.3 joints at all washroom vanities, hair dryers, hand dryers, electrical panels, access doors and adjacent surfaces. (Use sanitary caulking.)

.4 joints between masonry and concrete surfaces.

.5 joints between gypsum board and masonry, or other materials.

.6 joints between louvres and other surfaces.

.7 exterior siding, prefinished metal fascia, flashing and trim.

.8 penetrations through roofs, floors and walls other than firestopping

.9 at all other locations on drawings, except as noted below.

.2 Sealing of joints to the underside of exposed precast slab to be by precast installer.

.3 Sealing of all joints at top of walls meeting exposed flat or sloped precast ceilings to be included in this section.

3.8 REQUIRED INSPECTION

.1 Contractor to engage exterior sealant manufacturer’s representative to review in order to provide manufacturer’s warranty. Manufacturer’s representative shall review substrate conditions as prepared on site and prior to the application of the sealant. If requested, manufacturer to supply a written copy of this warranty.

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END OF SECTION

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Part 1 General

1.1 RELATED SECTIONS

.1 Section 01 33 00 - Submittal Procedures.

.2 Section 07 92 10 - Joint Sealing: Caulking of joints between frames and other building components.

.3 Section 08 71 10 - Door Hardware - General: Supply of finish hardware, including weatherstripping and mounting heights.

.4 Section 09 91 23 - Interior Painting.

.5 Section 09 91 13 - Exterior Painting.

1.2 REFERENCES

.1 American Society for Testing and Materials (ASTM International)

.1 ASTM A653/A653M-[01a], Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process.

.2 ASTM B29-[92(1997)], Specification for Refined Lead.

.3 ASTM B749-[97], Specification for Lead and Lead Alloy Strip, Sheet and Plate Products.

.2 Canadian General Standards Board (CGSB)

.1 CAN/CGSB-1.181-[99], Ready-Mixed Organic Zinc-Rich Coating.

.2 CGSB 41-GP-19Ma-[84], Rigid Vinyl Extrusions for Windows and Doors.

.3 Canadian Standards Association (CSA International)

.1 G40.20/G40.21-[98], General Requirements for Rolled or Welded Structural Quality Steel/Structural Quality Steel.

.2 CSA W59-[M1989(R2001)], Welded Steel Construction (Metal Arc Welding) (Metric Version).

.4 Canadian Steel Door Manufacturers' Association, (CSDMA).

.1 CSDMA, Specifications for Commercial Steel Doors and Frames, [1990].

.2 CSDMA, Recommended Selection and Usage Guide for Commercial Steel Doors, [1990].

.5 National Fire Protection Association (NFPA)

.1 NFPA 80-[99], Standard for Fire Doors and Fire Windows.

.2 NFPA 252-[99], Standard Methods of Fire Tests of Door Assemblies.

.6 Underwriters' Laboratories of Canada (ULC)

.1 CAN4-S104-[80(R1985)], Fire Tests of Door Assemblies.

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.2 CAN4-S105-[85(R1992)], Fire Door Frames Meeting the Performance Required by CAN4-S104.

.7 CAN/ULC-S701-[01], Thermal Insulation, Polystyrene, Boards and Pipe Covering.

.8 CAN/ULC-S702-[97], Thermal Insulation, Mineral Fibre, for Buildings.

.9 CAN/ULC-S704-[01], Thermal Insulation, Polyurethane and Polyisocyanurate Boards, Faced.

1.3 DESIGN REQUIREMENTS

.1 Design exterior frame assembly to accommodate to expansion and contraction when subjected to minimum and maximum surface temperature of -35°C to 35°C.

.2 Maximum deflection for exterior steel entrance screens under wind load of 1.2 kPa not to exceed 1/175th of span.

1.4 WORK INCLUDED

.1 A single manufacturer shall fabricate products included within the scope of this Section.

.2 Manufacturer shall be a member in good standing of the Canadian Steel Door Manufacturers Association (CSDMA).

.3 Supply only of steel frame products including frames, transom frames, sidelight and window assemblies with provision for glazed, paneled or louvered openings, fire labeled and non-labeled, as scheduled or detailed by the Consultant.

.4 Supply only of flush steel doors with provision for glazed, paneled or louvered openings, insulated and un-insulated, fire labeled, with or without temperature rise ratings and non-labeled, as scheduled or detailed by the Consultant.

.5 Supply only of steel panels, similar in construction to steel doors, with flush or abetted bottoms for steel frames, transom frames, sidelight and window assemblies, fire labeled and non-labeled, as scheduled or detailed by the Consultant.

1.5 RELATED WORK

.1 Building-in of frame product into unit masonry, previously placed concrete, structural or steel or wood stud walls.

.2 Supply and installation of wood, plastic or composite core doors.

.3 Supply and installation of builders' hardware except as specified for acoustic assemblies.

.4 Drilling and tapping for surface mounted or non-templated builders' hardware.

.5 Caulking of joints between frame product and other building components.

.6 Supply and installation of gaskets or weather-strip.

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.7 Supply and installation of louvers or vents.

.8 Supply and installation of glazing materials.

.9 Site touch-up and painting.

.10 Wiring for electronic or electric hardware.

.11 Field measurements.

.12 Fasteners for frame product in previously placed concrete, masonry or structural steel.

.13 Steel lintels, posts, columns or other load-bearing elements.

.14 Field welding.

1.6 SHOP DRAWINGS

.1 Submit shop drawings in accordance with Section 01 33 00 - Submittal Procedures.

.2 Indicate each type of door, material, steel core thicknesses, mortises, reinforcements, location of exposed fasteners, openings, glazed, or louvred, arrangement of hardware and fire rating and finishes.

.3 Indicate each type frame material, core thickness, reinforcements, glazing stops, location of anchors and exposed fastenings and reinforcing and fire rating finishes.

.4 Include schedule identifying each unit, with door marks and numbers relating to numbering on drawings and door schedule.

.5 Submit test and engineering data, and installation instructions.

1.7 REQUIREMENTS

.1 Steel fire rated doors and frames: labelled and listed by an organization accredited by Standards Council of Canada in conformance with CAN4-S104M [NFPA 252] for ratings specified or indicated.

1.8 WASTE MANAGEMENT AND DISPOSAL

.1 Remove from site and dispose of packaging materials at appropriate recycling facilities.

.2 Collect and separate for disposal paper, plastic, polystyrene and corrugated cardboard packaging material in appropriate on-site bins for recycling.

.3 Divert unused paint and sealant materials from landfill to official hazardous material collections site approved by Consultant.

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.4 Do not dispose of unused paint and sealant materials into sewer systems, into lakes, streams, onto ground or in other locations where it will pose health or environmental hazard.

.5 Divert unused metal materials from landfill to metal recycling facility approved by Consultant.

.6 Divert unused wood materials from landfill to recycling, reuse or composting facility wherever possible.

.7 Damaged or broken glazing materials are not recyclable. These materials must not de disposed of with materials destined for recycling.

1.9 TESTING AND PERFORMANCE

.1 Door constructions covered by this specification shall be certified as meeting Level "A" (1,000,000 cycles) and Twist Test Acceptance Criteria (deflection not to exceed 6.4 mm /13.6kg force, total deflection at 136.1kg force not to exceed 63.5 mm and permanent deflection not to exceed 3.2 mm) when tested in strict conformance with ANSI-A250.4-1994. Test shall be conducted by an independent nationally recognized accredited laboratory.

.2 Fire labeled product shall be provided for those openings requiring fire protection and temperature rise ratings, as determined and scheduled by the Architect. Doors, frames, transom frames and sidelight assemblies shall be tested in strict accordance with CAN4-S106. Product shall be listed by Underwriters Laboratories of Canada under an active Factory Inspection Program and shall be constructed as detailed in Follow-Up Service procedures issued to the manufacturer.

.3 Should any door or frame specified by the Architect to be fire rated, not qualify for labeling due to design, hardware, glazing or any other reason, the Consultant shall be so advised before manufacturing commences.

.4 Core materials for exterior doors shall attain a thermal resistance rating of RSI 1.06 (R6.0) when tested in accordance with ASTM C177 or ASTM C518.

.5 Product shall be manufactured by a firm experienced in the design and production of standard and custom commercial steel door and frame assemblies, the integration of builders' or electronic hardware and glazing materials and their impact on the scope of work.

.6 Manufacturer shall be assessed and registered as meeting the requirements of Quality Systems under ISO 9001.

.7 Product quality shall meet standards set by the Canadian Steel Door Manufacturers Association.

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1.10 TEST REPORTS

.1 All alternates to this specification shall be submitted to the Architect for acceptance ten (10) days prior to bid date, complete with test reports from independent, nationally recognized testing authorities, certifying that:

.1 Steel door and frame assemblies furnished under this section meet the acceptance criteria of ANSI-A250.4-1994, Level "A".

.2 Insulated door cores furnished in exterior doors under this Section meet the specified thermal resistance rating.

.2 All reports shall include name of testing authority, date of test, location of test facility, descriptions of test specimens, procedures used in testing and indicate compliance with acceptance criteria of the test.

1.11 WARRANTY

.1 All steel door and frame product shall be warranted from defects in workmanship for a period of one (1) year from date of shipment.

.2 All steel door and frame product shall be warranted against rust perforation for a period of ten (10) years when the installed and finish painted with a commercial quality paint to the manufacturers recommendations.

.3 Finish paint adhesion on all door and frame product shall be warranted for a period of ten (10) years when the product has been properly cleaned and finish painted with a commercial quality paint applied as recommended by the paint manufacturer. This warranty shall not exceed that provided by the paint manufacturer.

Part 2 Products

2.1 MATERIALS

.1 Doors shall be fabricated from tension leveled steel to ASTM A924-M97, galvanized to ASTM A653-M97, Commercial Steel (CS), Type B, coating designation ZF75, known commercially as paintable Galvanneal.

.1 Acceptable Manufacturer: Flemming

.2 Acceptable Alternate Manufacturer: Trillium Steel Doors Limited, or others meeting these exact specifications outlined in this section.

.2 Door Cores:

.3 Honeycomb:

.1 Structural small cell (25.4 mm maximum) kraft paper "honeycomb". Weight: 36.3 kg per ream (minimum), density: 16.5 kg/m^3 (minimum), sanded to the required thickness.

.4 Polystyrene:

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.1 Rigid extruded, fire retardant, closed cell board, density 16kg/m^2, thermal values: RSI 1.06 minimum, conforming to ASTM C578.

.5 Temperature Rise Rated (TRR):

.1 Solid slab core of non-combustible, inorganic composite to limit temperature rise on the "unexposed" side of door to 250°C at 30 or 60 minutes, as required by governing building code requirements and determined and scheduled by the Architect.

.6 Adhesives:

.1 Honeycomb Cores and Steel Components: Heat resistant, spray grade, resin reinforced neoprene/rubber (polychloroprene) based, low viscosity, contact cement or ULC approved equivalent.

.7 Interlocking Edge Seams:

.1 Resin reinforced polychloroprene (RRPC), fire resistant, high viscosity, sealant/adhesive or UL approved equivalent.

.8 Polystyrene Cores:

.1 Heat resistant, epoxy based, low viscosity, contact cement.

.9 Primer:

.1 Rust inhibitive touch-up only.

.10 Exterior Top Caps:

.1 Rigid polyvinylchloride (PVC) extrusion.

2.2 DOOR FABRICATION

.1 This section is based on doors and frames as manufactured by Fleming. Doors and frames by other manufacturers are acceptable subject to be similar to the one specified and meeting the terms of this section.

.2 Doors shall be swinging, 44.4 mm thick of the types and sizes indicated on the Architect's schedules or drawings.

.3 Exterior doors shall be lock seam, flush.

.4 Face sheets for exterior doors shall be fabricated from (16) gauge steel.

.5 Longitudinal edges of exterior doors shall be fully welded, ground smooth with no visible seams.

.6 Face sheets of interior doors shall be fabricated from 18 gauge steel, except for heavy traffic doors (noted **HT** in Door Schedule) face sheet to be 16 gauge.

.7 Longitudinal edge of heavy traffic doors (noted **HT** in Door Schedule) shall be mechanically interlocked, fully welded, ground smooth with no visible seams. Do not fill seams.

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.8 Interior doors shall be stiffened, insulated and sound deadened with honeycomb core laminated under pressure to each face sheet.

.9 Stiffened, insulated and sound deadened with Fleming's propriety core where Temperature Rise Rated (TRR) fire labeled doors are specified on the Architect's schedules.

.10 Longitudinal edges of interior doors shall be mechanically interlocked, adhesive assisted with edge seams and tack-welded every 150 mm and filled flush.

.11 Door faces of all steel doors shall be fabricated without visible seams, free of scale, pitting, coil brakes, buckles and waves.

.12 Formed edges shall be true and straight with a minimum radius for the thickness of steel used.

.13 Lock and hinge edges shall be beveled 3 mm in 50 mm unless builders' hardware or door swing dictates otherwise.

.14 Top and bottom of doors shall be provided with inverted, recessed, 16 gauge steel end channels, welded to each face sheet at 150 mm on center maximum.

.15 Exterior doors shall be provided with factory installed flush PVC top caps. Fire labeled exterior doors shall be provided with factory installed flush steel top caps.

.16 Unless ineligible due to design, size, hardware or glazing specified on the Architects' or hardware Suppliers' schedules or details, fire labeled doors shall be provided for those openings requiring fire protection ratings and temperature rise ratings, as determined and scheduled by the Architect.

.17 Exterior doors and high traffic doors shall be internally reinforced with 20 gauge continuous; interlocking steel stiffeners at 150mm O.C. max, with voids between stiffeners filled and insulated with 24kg/m3 density loose batt type fiberglass material to suit fully welded design.

.18 Doors shall be factory blanked, reinforced, drilled and tapped for fully templated mortised hardware only, in accordance with the final approved schedule and templates provided by the hardware supplier.

.19 Doors shall be factory blanked and reinforced only for mortised hardware that is not fully templated.

.20 Doors shall be factory reinforced only for surface mounted hardware.

.21 Templated holes 12.7mm diameter and larger shall be factory prepared, except mounting and through bolt holes, which shall be by the contractor responsible for installation on site, at the time of application. Templated holes less than 12.7mm diameter shall be factory prepared only when required for the function of the device (for knobs, levers, cylinders, thumb or turn pieces) or when these holes over-lap function holes.

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.22 Drilling and tapping for surface mounted hardware or mortised hardware that is not fully templated shall be by the contractor responsible for installation on site, at the time of application.

.23 Hinge and pivot reinforcements shall be 10 gauge steel minimum high frequency type reinforcing.

.24 Hinge reinforcements for acoustic doors and doors in excess of 2450mm rabbet height shall be 10 gauge minimum with each cutout provided with 114.3mm heavy weight (4.6mm) high frequency type.

.25 Lock, strike and flush bolt reinforcements shall be 12 gauge steel minimum.

.26 Reinforcements for concealed closers and holders shall be 12 gauge steel minimum.

.27 For surface mounted hardware, reinforcements shall be 16 gauge steel minimum.

.28 All pairs of fire labeled doors shall be provided with 12 gauge steel surface mounted flat bar astragal, shipped loose for application on site, by the contractor responsible for installation.

.29 Pairs of doors up to 2450mm x 2450mm, to 1½ hour fire rating maximum shall be provided without astragals. Lock edge seam of such doors shall be tacked-welded and ground smooth. All other fire labeled pairs shall be provided with 12 gauge steel surface mounted flat bar astragal, shipped loose for application on site, by the contractor responsible for installation.

.30 Where electrically or electronically operated hardware is specified on the Architects' schedules or details of the final approved schedule and templates provided by the hardware supplier, hardware enclosures and/or junction boxes, where indicated on the templates, shall be provided and interconnected with CSA Approved 12.7mm diameter conduit and connectors.

.31 Prepare doors to receive security door contacts – refer to electrical drawings for locations. Door contacts to be installed at 100 mm from the latch side door edge.

2.3 GLAZING

.1 Where 6mm thick glazing materials are specified on the Architects schedules or details, doors shall be provided with 20 gauge steel glazing trim and snap-in glazing stops.

.2 Where other that 6mm glazing is specified on the Architect's schedules or details, doors shall receive 20 gauge steel trim and screw fixed glazing stops. Screws shall be #6 x 32mm oval head scrulox (self-drilling) type at 300mm on center maximum.

.3 Glazing trim and stops shall be accurately fitted, butted at corners, with removable glazing stops located on the 'push' side of the door.

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2.4 LOUVER

.1 Where specified on the Architect's schedules or details, non-labeled doors shall be prepared on accordance with the louver manufacturer's details.

.2 Where specified on the Architect's schedules or details, fire labeled doors shall be prepared for UL listed sight-proof fusible link louvers in accordance with the louver manufacturer's details.

.3 Louvers shall be supplied and installed by others.

2.5 FINISHING

.1 Remove weld slag and splatter from exposed surfaces.

.2 All tool marks, abrasions and surface blemishes shall be filled and sanded to present smooth uniform surfaces.

.3 On exposed surfaces where zinc coating has been removed during fabrication, doors shall receive a factory applied touch-up primer.

.4 Primer shall be fully cured prior to shipment.

2.6 PANELS

.1 Panels shall be fabricated form the same materials, construction and finished in the same manner as doors as specified in Section 2.1.

2.7 PRIMER

.1 Touch-up prime CAN/CGSB-1.181.

2.8 PAINT

.1 Field paint steel doors and frames in accordance with Section[s] [09 91 23 - Interior Painting], [09 91 13 - Exterior Painting]. Protect weatherstrips from paint. Provide final finish shall be free of scratches or other blemishes.

2.9 FRAMES FABRICATION GENERAL

.1 Steel:

.1 Frame product shall be fabricated from tension leveled steel to ASTM A924-M97, galvanized to ASTM A653-M97, Commercial Steel (CS), Type B, coating designated ZF75, known commercially as paintable Galvanneal.

.2 Primer:

.1 Rust inhibitive touch up only.

.3 Miscellaneous:

.1 Door Silencers: GJ-64, Single Stud rubber/neoprene type

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.2 Thermal Breaks: Rigid polyvinylchloride (PVC) extrusion

.3 Fiberglass: Loose batt type, density: 24kg/m^3 (minimum), conforming to ASTM C665.

.4 General:

.1 All steel frame product shall be as manufactured by Fleming of the types, sizes and profiles indicated on the Architects' schedules or details.

.2 Exterior frames shall be thermally broken, Fleming *Therma-Frame* Series, fabricated from 16 gauge steel.

.3 Exterior frame product shall be supplied profile welded (PW)

.4 Interior and exterior sections of thermally broken frames shall be separated by a continuous PVC thermal break.

.1 Thermally broken sections shall not be assembled by means of screws, grommets or other fasteners and welds shall not cause thermal transfers between interior and exterior surfaces of the frame sections.

.2 Closed sections (mullions and center rails) of thermally broken frames shall be factory insulated with 24kg/m^3 loose batt type fiberglass material.

.5 Insulation of open sections (jambs, heads and sills) on exterior frame product shall be provided and installed by the contractor responsible for installation.

.6 Interior frames shall be Fleming F-Series, fabricated from 16 gauge steel.

.7 Interior frame product shall be supplied profile welded (PW)

.8 Knocked-down and knocked-down drywall frames shall not be acceptable.

.9 Jambs, heads, mullions, sills and center rails shall be straight and uniform throughout their lengths.

.10 Frame product shall be square, free of defects, wraps or buckles.

.11 Corner joints shall be profile welded (PW) (continuously welded on the inside of the profiles' faces, rabbets, returns and soffit intersections with exposed faces filled and ground to a smooth, uniform, seamless surface)"

.12 Joints at mullions, transom bars, sills or center rails shall be coped accurately, butted and tightly fitted, with faces securely welded, matching corner joint faces.

.13 All steel mullions will be fabricated from the same materials as specified for the steel frames. Steel mullions will be fabricated as a fully assembled three piece unit consisting of a front, back and full height one piece attachment clip as per Fleming F Series. The attachment clip will completely fill the stop area of the mullion on both sides and span the void between each side forming a grid channel like structure. Mullions used as hinge mullions or strike mullions between doors will be filled with grout by the general contractor either prior to or following installation of the frame. The head of the frame shall have an opening sufficient for the grout to be poured in to the mullion.

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.14 Mullions shall be fabricated with continuous 20 gauge galvanneal steel internal reinforcing clips.

.15 Frame product shall be fabricated with integral door stops having a minimum height of 16mm.

.16 Glazing stops shall be formed 20 gauge steel, 16mm height channel, accurately fitted, butted at corners and fastened to frame sections with #6 x 32mm oval head scrulox (self-drilling) type screws at 300mm on center maximum.

.17 Where required due to site access, as indicated on the Architects' schedules or details, when advised by the contractor responsible for co-ordination or installation, or when shipping limitations so dictate, frame product shall be fabricated in sections for splicing in the field.

.1 Field spliced jambs, heads and sills shall be provided with 16 gauge steel splice plates securely welded into one section, extending 100mm minimum each side of splice joint.

.2 Field splices at closed sections (mullions or center rails) shall be 16 gauge steel splice angles securely welded to the abutting member. Face of splice angle shall extend 100mm minimum into closed sections when assembled.

.3 Field splice joints shall be welded, filled and ground to present a smooth uniform surface by the contractor responsible for installation after assembly.

.18 Each door opening shall be provided with two (2) temporary steel jamb spreaders welded to the base of the jambs or mullions to maintain proper alignment during shipping and handling. Spreaders shall be removed by the contractor responsible for installation prior to anchoring of frame to floor.

.19 Each door opening shall be prepared for GJ-64 or equivalent, single stud door silencers, three (3) for single door openings, two (2) for double door openings. Silencers shall be shipped loose for installation by the contractor after finish painting.

.20 Unless ineligible due to design, size, hardware or glazing specified on the Architects' or Hardware Suppliers' schedules or details, fire labeled frame product shall be provided for those openings required fire protection ratings as determined and scheduled by the Architect.

.21 Hardware Preparations:

.1 Frame product shall be blanked, reinforced, drilled and tapped for fully template mortised hardware only, in accordance with the final approved schedule and template provided by the hardware supplier.

.2 Frame product shall be factory blanked and reinforced only for mortised hardware that is not fully template.

.3 Frame product shall be reinforced only for surface mounted hardware.

.4 Drilling and tapping for surface mounted hardware or mortised hardware that is not fully template shall be by the contractor responsible for installation on site, at the time of application.

.5 Frames shall be prepared for 114.3mm standard weight hinges (minimum).

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.6 Hinge and pivot reinforcements shall be 10 gauge steel minimum reinforcing, high frequency type shall be provided.

.7 Hinge reinforcements for acoustic frames and frames in excess of 2450mm rabbet height shall be 10 gauge minimum with each cutout provided with 114.3mm heavy weight (4.6mm) high frequency type.

.8 Strike reinforcements shall be 16 gauge steel minimum.

.9 Reinforcements for surface mounted hardware, concealed closers and holders and flush bolts shall be 12 gauge steel minimum.

.10 Mortised cutouts shall be protected with 22 gauge steel minimum guard boxes.

.11 Where electrically or electronically operated hardware is specified on the Architects schedules or details or the final approved schedule and templates provided by the hardware supplier, hardware enclosures and/or junction boxes, where indicated on templates, shall be provided and inter-connected with CSA Approved 12.7mm diameter conduit and connectors.

.12 Prepare frames to receive security door contacts – refer to electrical drawings for locations. Door contacts to be installed at 100 mm from the latch side door edge.

.22 Anchorage:

.1 Frame product shall be provided with anchorage appropriate to floor, wall and frame construction.

.2 Each wall anchor shall be located immediately above or below each hinge reinforcement on the hinge jamb and directly opposite on the strike jamb, except as indicated below.

.3 Frame product installed in unit masonry partitions shall be provided with 4.0mm diameter steel wire anchors, 18 gauge steel adjustable stirrup and strap or “T” type anchors as conditions dictate.

.4 Where frame product is installed prior to construction of the adjacent wall, each jamb shall be provided with 16 gauge steel floor anchors. Each anchor shall be provided with two (2) holes for mounting to the floor and shall be securely welded to the inside of the jamb.

.5 Floor anchors for thermally broken exterior frames shall be designed so as not to permit thermal transfers from exterior to interior surfaces of the frame sections.

.6 Frame product installed in drywall partitions shall be provided with 20 gauge steel snap-in or “Z” type stud type anchor.

.7 Jambs of frames in previously placed concrete, masonry or structural steel shall be punched and dimpled to accept machine bolt anchors, 6.4mm diameter, located not more than 150mm from the top and bottom of each jamb. Anchor preparations and guides shall also be located immediately above or below the intermediate hinge reinforcing and directly opposite on the strike jamb. Each preparation shall be provided with 16 gauge anchor bolt guides.

.8 Anchor bolts and expansion shell anchors for the above preparations shall be provided by the contractor responsible for installation.

.9 After sufficient tightening of the anchor bolts, the heads shall be welded do as to provide a non-removable application. Welded bolt head and dimple shall be filled

and ground to present a smooth uniform surface by the contractor responsible for installation, prior to finish painting.

.10 Where indicated on the Architects' schedules or details, channel extensions shall be provided from the top of the frame assembly to the underside of the structure above. Extensions shall be fabricated from 12 gauge steel formed channel, mounting angles welded to inside of frame head and adjusting brackets. Formed channels, adjusting brackets and fasteners shall be shipped loose. Channels shall be mechanically connected to mounting angles and adjusting brackets with supplied fasteners, on site, by contractor responsible for installation.

.23 Finishing:

.1 Remove weld slag and spatter from exposed surfaces.

.2 All tool marks, abrasions and surface blemishes shall be filled and sanded to present smooth and uniform surfaces.

.3 On exposed surfaces where zinc has been removed during fabrication, frame product shall receive a factory applied touch-up primer.

.4 Primer shall be fully cured prior to shipment.

2.10 SIZES AND TOLERANCES

.1 All sizes and tolerances shall be in accordance with the Canadian Steel Door Manufacturers Association "Recommended Dimensional Standards for Commercial Steel Doors and Frames" as follows:

.1 Widths of door openings shall be measured from inside of frame jamb rabbet with a tolerance of +1.6mm, -0.8mm.

.2 Heights of door openings shall be measured from the finished floor (exclusive of floor coverings) to the head rabbet of the frame with a tolerance of $\pm$ 1.2mm.

.3 Unless builders' hardware dictates otherwise, doors shall be sized so as to fit the above openings and allow a 3mm clearance at jambs and head. A clearance of 19mm between the bottom of the door and the finished floor (exclusive of floor coverings) shall be provided. Tolerances on door sizes shall be $\pm$ 1.2mm.

.4 Manufacturing tolerances on formed frame profiles shall be $\pm$ 0.8mm for faces, door stop heights and jamb depths. Tolerances for throat openings and door rabbet shall be $\pm$ 1.6mm and $\pm$ 0.4mm respectively. Hardware cutout dimensions shall be as per template dimensions, +0.4mm, -0.

2.11 HARDWARE LOCATIONS

.1 Hardware preparations in frame product shall be as noted below and locations on doors shall be adjusted for clearances specified in 2.4.

.2 Top of upper hinge preparation for 114.3mm hinges shall be located 180mm down from head, transom mullion or panel as appropriate. The top of the bottom hinge preparation for 114.3mm hinges shall be located 310mm from finished floor as defined in 2.4.3. Intermediate hinge preparations shall be spaced equally between top and bottom cutouts. For dutch door frames, top and bottom hinge locations shall be as above, with the tops of intermediate hinges located at 930mm and 1403mm from finished floor.

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.3 Strike preparations for unit, integral, cylindrical and mortise locks and roller latches shall be centered 1033mm from finished floor. Strikes for deadlocks shall be centered at 1200mm from finished floor. Strikes for panic or fire exit hardware shall be located as per device manufacturer's templates.

.4 Push and/or pulls on doors shall be centered 10701mm from finished floor.

.5 Preparations not noted above shall be as per hardware manufacturer's templates.

.6 Hardware preparation tolerances shall comply with the ANSI A115 series standards.

Part 3 Execution

3.1 SITE AND PROTECTION OF MATERIALS

.1 The contractor responsible for installation shall remove wraps or covers from door and frame product upon delivery at building site.

.2 All materials shall be thoroughly inspected upon receipt and all discrepancies, deficiencies and/or damages shall be immediately reported in writing to the supplier, All damage shall be noted on the carriers' Bill of Landing.

.3 Contractor responsible for installation shall ensure all materials are properly stored on planks or dunnage in a dry location. Product shall be stored in a vertical position, spaced with blocking to permit air circulation between them. Materials shall be covered to protect them from damage from any cause.

.4 Contractor shall notify the supplier in writing of any errors or deficiencies in the product itself before initiating any corrective work.

3.2 INSTALLATION GENERAL

.1 Install labelled steel fire rated doors and frames to NFPA 80 except where specified otherwise.

.2 Install doors and frames to CSDMA Installation Guide.

.3 Install doors and frames in accordance with the Door and Hardware Institute "Installation guide for doors and hardware".

.4 Set frame product plumb, square, aligned, without twist at correct elevation.

.5 Frame Product Installation Tolerances:

.1 Plumbness tolerance, measured through a line from the intersecting corner of vertical members and the head to the floor, shall be $\pm$ 1.6mm.

.2 Squareness tolerance, measured through a line 90^0 from one jamb at the upper corner of the product, to the opposite jamb, shall be $\pm$ 1.6mm.

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.3 Alignment tolerance, measured on jambs, through a horizontal line parallel to the plane of the wall, shall be ± 1.6mm.

.4 Twist tolerance, measured at face corners of jambs, on parallel lines perpendicular to the plane of the wall, shall be ± 1.6mm.

.6 Fire labeled product shall be installed in accordance with NFPA-80.

.7 Secure anchorages and connections to adjacent construction.

.8 Brace frame product rigidly in position while building-in. Remove temporary steel shipping jamb spreaders. Install wood spreaders at mid points of frame rabbet height and at floor level to maintain frame widths. Provide vertical support at center of head for openings exceeding 1250mm in width. Remove wood spreaders after product has been built-in.

.9 Frame product in unit masonry shall be fully grouted in place.

.10 Install doors maintaining clearances outlined in Section 2.4.

.11 Install louvers and vents.

.12 Adjust operable parts for correct clearances and function.

.13 Steel surfaces shall be kept free of grout, tar or other bonding materials or sealers.

.14 Any grout or other bonding material shall be cleaned from products immediately following installation.

.15 Exposed field welds shall be finished to present a smooth uniform surface and shall be touched-up with a rust inhibitive primer.

.16 Exposed surfaces that have been scratched or otherwise marred during shipment, installation or handling shall be touched-up with a rust inhibitive primer.

.17 Finish paint in accordance with Section 099116 and 099123.

.18 Install glazing materials and door silencers.

3.3 INSPECTION

.1 In accordance with Section 01 11 00, upon assignment of an inspection agency the following inspections shall be performed:

.1 review of shop drawings for compliance with specification

.2 shop inspection during production. Should inspection notification not be given suitable to review fabrication, destructive testing of one or more doors will be undertaken either in the shop or on site at no additional cost to the owner. Doors destroyed for invasive inspection shall be replaced as part of the contract price.

.2 upon notification of initial door inspection, contractor shall notify inspector to witness installation practice and at periodic points for duration of installation period.

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3.4 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.

3.5 GLAZING

.1 Install glazing for doors and frames in accordance with Section 08 80 50 - Glazing.

END OF SECTION

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Part 1 General

1.1 GENERAL NOTES

.1 Find the Door Schedule on the following pages.

.2 This schedule MUST be read in conjunction with a complete set of drawings and a complete Hardware Schedule.

.3 Refer to AD Drawings for door and frame types and details.

1.2 ABBREVIATIONS CODE

.1 1. The following abbreviations are used in the Door Schedule.

	Code	Reference
.2	DC	Door Contact (security)
.3	P	Paint
.4	HM	Hollow Metal
.5	GW	Georgian Wire
.6	TG	Tempered Glass
.7	45 MIN	45 minute fire rating
.8	HT	Heavy Traffic – see spec for welded seams, special reinforcing.
.9	B/F	Barrier-Free
.10	WD	Laminate Faced Wood Door
.11	P.LAM	Plastic Laminate Finish on Wood Door
.12	ALUM.	Aluminum
.13	ANNO.	Anodized Finish

1.3 DOOR SCHEDULE

.1 Door Schedule designation “DC” refers to “Door Contacts” used in the security system. Refer to Electrical Drawings and Division 16 Specifications for locations, zoning and description of system.

END OF SECTION

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DOOR #	ROOM	DOOR								FRAME					REMARKS
		WIDTH	HEIGHT	FIRE	H.T.	TYPE	MAT'L	FIN	GLASS	TYPE	MAT'L	FIN	DC	GLASS	
GROUND FLOOR															
101 A	VESTIBULE 101	2X1000	2150	-	Y	F	ALUM.	ANNO.	TP	CW1	ALUM.	ANNO.	Y	TP	B/F DOOR OPERATOR, REMOVEABLE MULLION, ELECTRIC SECURITY STRIKE TO OFFICE. COORDINATE DOOR WITH CURTAIN WALL MANUFACTURER. COORD WITH ELEC FOR VIDEO INTERCOM SYSTEM / CARD READER.
101 B	VESTIBULE 101	2X1000	2150	-	Y	F	ALUM.	ANNO.	TP	CW25	ALUM.	ANNO.	Y	TP	B/F DOOR OPERATOR. REMOVEABLE MULLION
103 A	LEARNING COMMONS 103	2X1000	2150	-	Y	F	ALUM.	ANNO.	TP	CW23a	ALUM.	ANNO.	-	TP	B/F DOOR OPERATOR TO BE INSTALLED ON LEARNING COMMONS SIDE, REMOVEABLE MULLION, COORDINATE DOOR WITH CURTAIN WALL MANUFACTURER.
103 B	LEARNING COMMONS 103	2X1000	2150	-	Y	F	ALUM.	ANNO.	TP	CW5	ALUM.	ANNO.	Y	TP	COORDINATE DOOR WITH CURTAIN WALL MANUFACTURER.
104 A	WORKROOM 104	950	2150	-	-	D	HM	P	TP	3	HM	P	-	TP	
105 A	CART ROOM 105	950	2150	-	-	A	HM	P	-	1	HM	P	-		
106 A	GENERAL OFFICE 106	950	2150	-	-	B	WD	PLAM	TP	CW35	ALUM.	ANNO.	-	TP	B/F DOOR OPERATOR. COORDINATE DOOR WITH CURTAIN WALL MANUFACTURER.
106 B	GENERAL OFFICE 106	950	2150	45MIN	-	A	HM	P	-	1	HM	P	-	-	
107 A	WORKROOM 107	950	2150	-	-	B	WD	PLAM	TP	1	HM	P		-	
107 B	WORKROOM 107	950	2150	-	-	B	WD	PLAM	TP	1	HM	P		-	
108 A	OFFICE 108	950	2150	-	-	D	WD	PLAM	TP	1	HM	P		-	
109 A	OFFICE 109	950	2150	-	-	D	WD	PLAM	TP	1	HM	P		-	
110 A	OFFICE 110	950	2150	-	-	D	WD	PLAM	TP	1	HM	P		-	
111 A	OSR 111	950	2150	-	-	D	WD	PLAM	TP	1	HM	P		-	

DOOR #	ROOM	DOOR								FRAME					REMARKS
		WIDTH	HEIGHT	FIRE	H.T.	TYPE	MAT'L	FIN	GLASS	TYPE	MAT'L	FIN	DC	GLASS	
112 A	HEALTH 112	950	2150	-	-	D	WD	PLAM	TP	1	HM	P		-	
113 A	WASHROOM 113	950	2150	-	-	A	WD	PLAM	-	1	HM	P		-	
114 A	STORAGE 114	950	2150	-	-	A	WD	PLAM	-	1	HM	P		-	
115 A	SEMINAR 1	950	2150	-	-	B	WD	PLAM	TP	1	HM	P		-	
116 A	OFFICE 116	950	2150	-	-	D	HM	P	TP	1	HM	P		-	
117 A	RECEIVING/CUSTODIAN 117	950	2150	45MIN	-	A	HM	P	-	1	HM	P		-	
117 B	RECEIVING/CUSTODIAN 117	1100	2150	-	-	A	HM	P	-	1	HM	P	Y	-	INSULATED DOOR & FRAME.
118 A	ELECTRICAL 118	950	2150	45MIN	-	A	HM	P	-	1	HM	P		-	
120 A	SEMINAR 2	950	2150	-	-	B	WD	PLAM	TP	12	HM	P		-	
121 A	NUTRITION 121	950	2150	20MIN	-	D	HM	P	FRG	1	HM	P		-	
122 A	STAGE 122	950	2150	20MIN	-	C	HM	P	FRG	CW23e	ALUM.	ANNO.		TP	COORDINATE DOOR WITH CURTAIN WALL MANUFACTURER.
122 B	STAGE 122	950	2150	20MIN	-	C	HM	P	FRG	CW24a	ALUM.	ANNO.		TP	ELECTROMAGNETIC HOLDER 150mm A.F.F, 180 DEGREE SWING. COORDINATE DOOR WITH CURTAIN WALL MANUFACTURER.
122 C	STAGE 122	950	2150	20MIN	-	C	HM	P	FRG	CW24c	ALUM.	ANNO.		TP	ELECTROMAGNETIC HOLDER 150mm A.F.F, 180 DEGREE SWING. COORDINATE DOOR WITH CURTAIN WALL MANUFACTURER.
124 A	CORRIDOR 124	950	2150	-	-	D	HM	P	TP	1	HM	P	-	-	
125 A	GYMNASIUM 125	2X1000	2150	20MIN	Y	C	HM	P	FRG	5A	HM	P	-	-	B/F OPERATOR, REMOVEABLE MULLION, 180 DEGREE SWING ONE LEAF. COORDINATE DOOR WITH CURTAIN WALL MANUFACTURER.
125 B	GYMNASIUM 125	2X1000	2150	-	-	F	ALUM.	ANNO.	TP	CW6	ALUM.	ANNO.	Y	TP	COORDINATE DOOR WITH CURTAIN WALL MANUFACTURER.
125 C	GYMNASIUM 125	2X1000	2150	-	-	A	HM	P	-	4	HM	P	Y	-	INSULATED DOOR & FRAME.

DOOR #	ROOM	DOOR								FRAME					REMARKS
		WIDTH	HEIGHT	FIRE	H.T.	TYPE	MAT'L	FIN	GLASS	TYPE	MAT'L	FIN	DC	GLASS	
125 D	GYMNASIUM 125	2X1000	2150	20MIN	-	C	HM	P	FRG	4	HM	P		-	
126 A	CHANGE ROOM 126	950	2150	-		A	HM	P	-	1	HM	P	-	-	
127 A	CHANGE ROOM 127	950	2150	-		A	HM	P	-	1	HM	P	-	-	
128A A	GYM STORAGE A 128	1100	2150	-	-	A	HM	P	-	1	HM	P	-	-	
128B A	GYM STORAGE B 128	1100	2150	-	-	A	HM	P	-	1	HM	P	-	-	
130 A	CLASSROOM 1 130	950	2150	-	-	D	WD	PLAM	TP	2	HM	P	-	TG	
131 A	CLASSROOM 2 131	950	2150	-	-	D	WD	PLAM	TP	1	HM	P	-	-	
132 A	STAIR A 132	2X1000	2150	-	Y	F	ALUM.	ANNO.	TP	CW8	ALUM.	ANNO.	Y	TP	B/F DOOR OPERATOR. COORDINATE DOOR WITH CURTAIN WALL MANUFACTURER.
132 B	STAIR A 132	2X1000	2150	45MIN	Y	C	HM	P	FRG	4	HM	P	-	-	B/F DOOR OPERATOR. 180 DEGREE SWING ONE LEAF
133 A	STAFF ROOM 133	950	2150	-	-	D	HM	P	TP	1	HM	P	-	-	
134 A	SENSORY 134	950	2150	-	-	D	WD	PLAM	TP	1	HM	P	-	-	
135 A	SAFE ROOM 135	950	2150	-	-	D	WD	PLAM	TP	1	HM	P	-	-	
136 A	THERAPY 136	950	2150	-	-	D	WD	PLAM	TP	1	HM	P	-	-	
136 B	THERAPY 136	950	2150	-	-	D	WD	PLAM	TP	1	HM	P	-	-	
137 A	SPEC. ED 137	950	2150	-	-	D	WD	PLAM	TP	1	HM	P	-	-	
141 A	LAN 141	950	2150	-	-	A	HM	P	-	1	HM	P	-	-	
142 A	UNIVERSALE WR 142	950	2150	-	-	A	HM	P	-	1	HM	P	-	-	B/F DOOR OPERATOR TO BE INSTALLED ON WR SIDE

DOOR #	ROOM	DOOR								FRAME					REMARKS
		WIDTH	HEIGHT	FIRE	H.T.	TYPE	MAT'L	FIN	GLASS	TYPE	MAT'L	FIN	DC	GLASS	
143 A	WASHROOM 143	950	2150	-	-	A	HM	P	-	1	HM	P	-	-	
144 A	WASHROOM 144	950	2150	-	-	A	HM	P	-	1	HM	P	-	-	
145 A	WORKROOM 145	950	2150	-	-	D	WD	PLAM	TP	2	HM	P	-	TP	
146 A	KINDERGARTEN 146	950	2150	-	-	D	WD	PLAM	TP	1	HM	P	-	-	
147 A	KINDERGARTEN 147	950	2150	-	-	D	WD	PLAM	TP	1	HM	P	-	-	
148 A	KINDERGARTEN 148	950	2150	-	-	D	WD	PLAM	TP	1	HM	P	-	-	
149 A	KINDERGARTEN 149	950	2150	-	-	D	WD	PLAM	TP	1	HM	P	-	-	
150 A	STAIR B 150	2X1000	2150	-	Y	F	ALUM.	ANNO.	TP	CW10	ALUM.	ANNO.	Y	TP	B/F DOOR OPERATOR, COORDINATE DOOR WITH CURTAIN WALL MANUFACTURER.
150 B	STAIR B 150	2X1000	2150	45MIN	Y	C	HM	P	FRG	4	HM	P		-	B/F DOOR OPERATOR, 180 DEGREE SWING ONE LEAF
150 C	STAIR B 150	2X1000	2150	-	Y	F	ALUM.	ANNO.	TP	CW11	ALUM.	ANNO.	Y	TP	B/F DOOR OPERATOR, COORDINATE DOOR WITH CURTAIN WALL MANUFACTURER.
151 A	KINDERGARTEN 151	950	2150	-	-	D	WD	PLAM	TP	1	HM	P	-	-	
152 A	CORRIDOR 152	2X1000	2150	-	-	B	HM	P	TP	6	HM	P	Y	TP	B/F DOOR OPERATOR, INSULATED DOOR & FRAME
153 A	KINDERGARTEN 153	950	2150	-	-	D	WD	PLAM	TP	1	HM	P	-	-	
154 A	STORAGE 154	950	2150	-	-	A	HM	P	-	1	HM	P	-	-	REFER TO INTERIOR ELEVATION OF CORRIDOR 140 FOR PATTERN OF PAINTING ON CORRIDOR SIDE.
154 B	STORAGE 154	950	2150	1.5HR	-	A	HM	P	-	1	HM	P	-	-	
155 A	OUTDOOR STORAGE 155	1100	2150	-	-	A	HM	P	-	1	HM	P	Y	-	INSULATED DOOR & FRAME
157 A	ELEVATOR MACH. RM 147	950	2150	45MIN	-	A	HM	P	-	1	HM	P	-	-	

DOOR #	ROOM	DOOR								FRAME					REMARKS
		WIDTH	HEIGHT	FIRE	H.T.	TYPE	MAT'L	FIN	GLASS	TYPE	MAT'L	FIN	DC	GLASS	
TEACHER'S CLOSET CYLINDER LOCK (1ST FLOOR) - REFER TO FLOOR PLANS FOR QUANTITY															
GROUND FLOOR - CHILDCARE															
301 A	VESTIBULE 301	2X1000	2150	-	Y	F	ALUM.	ANNO.	TP	CW15	ALUM.	ANNO.	Y	TP	B/F DOOR OPERATOR, REMOVABLE MULLION, ELECTRIC SECURITY STRIKE TO OFFICE. COORDINATE DOOR WITH CURTAIN WALL MANUFACTURER. COORD WITH ELEC FOR VIDEO INTERCOM SYSTEM / CARD READER, B/F OPERATOR IN CURTAIN WALL FRAMING. COORD. WITH ELEC. TO RUN CONDUIT IN FRAME SYSTEM
301 B	VESTIBULE 301	2X1000	2150	-	Y	B	HM	P	TP	5	HM	P	-	-	B/F OPERATOR
302 A	CORRIDOR 302	950	2150	-	Y	B	HM	P	TP	1	HM	P	-	-	
303 A	INFANT 303	950	2150	-	-	D	WD	PLAM	TP	1	HM	P	-	-	180 DEGREE SWING
304 A	VESTIBULE 304	950	2150	-	Y	F	ALUM.	ANNO.	TP	CW14b	ALUM.	ANNO.	Y	TP	B/F DOOR OPERATOR, COORDINATE DOOR WITH CURTAIN WALL MANUFACTURER.
304 B	VESTIBULE 304	950	2150	-	Y	B	HM	P	TP	1	HM	P	-	-	B/F DOOR OPERATOR
305 A	SLEEPING AREA 305	950	2150	-	-	D	WD	PLAM	TP	7	HM	P	-	-	
306 A	WASHROOM 306	950	2150	-	-	A	WD	PLAM	-	1	HM	P	-	-	
307 A	STORAGE 307	950	2150	-	-	A	WD	PLAM	-	1	HM	P	-	-	
308 A	OFFICE 308	950	2150	-	-	D	WD	PLAM	TP	8	HM	P	-	-	
309 A	CUST./MECH. 309	950	2150	-	-	A	HM	P	-	1	HM	P	-	-	
310 A	LAUNDRY 310	950	2150	-	-	A	HM	P	-	1	HM	P	-	-	
311 A	BARRIER-FREE WR 311	950	2150	-	-	A	WD	PLAM	-	1	HM	P	-	-	B/F OPERATOR
312 A	KITCHEN 312	950	2150	-	-	D	HM	P	TP	1	HM	P	-	-	

DOOR #	ROOM	DOOR								FRAME					REMARKS
		WIDTH	HEIGHT	FIRE	H.T.	TYPE	MAT'L	FIN	GLASS	TYPE	MAT'L	FIN	DC	GLASS	
312 B	KITCHEN 312	950	2150	-	-	D	HM	P	TP	1	HM	P	-	-	
313 A	STAFF ROOM 313	950	2150	-	-	D	WD	PLAM	TP	1	HM	P	-	-	
314 A	PRE-SCHOOL 314	950	2150	-	-	D	WD	PLAM	TP	1	HM	P	-	-	
314 B	PRE-SCHOOL 314	950	2150	-	Y	B	HM	P	TP	1	HM	P	-	-	B/F OPERATOR
315 A	WASHROOM 315	950	1200	-	-	E	WD	PLAM	-	3A	HM	P	-	TP	HALF DOOR, COORD. WITH WOOD JAMB. REF. AD DETAILS
316 A	VESTIBULE 316	950	2150	-	Y	F	ALUM.	ANNO.	TP	CW16	ALUM.	ANNO.	Y	TP	B/F OPERATOR, COORDINATE DOOR WITH CURTAIN WALL MANUFACTURER.
317 A	PRE-SCHOOL 317	950	2150	-	-	D	WD	PLAM	TP	1	HM	P	-	-	
317 B	PRE-SCHOOL 317	950	2150	-	Y	B	HM	P	TP	1	HM	P	-	-	B/F OPERATOR
318 A	WASHROOM 318	950	1200	-	-	E	WD	PLAM	-	3A	HM	P	-	TP	HALF DOOR, COORD. WITH WOOD JAMB. REF. AD DETAILS
319 A	TODDLER 319	950	2150	-	-	D	WD	PLAM	TP	1	HM	P	-	-	
319 B	TODDLER 319	950	2150	-	Y	B	HM	P	TP	1	HM	P	-	-	B/F OPERATOR
320 A	WASHROOM 320	950	1200	-	-	E	WD	PLAM	-	3A	HM	P	-	TP	HALF DOOR, COORD. WITH WOOD JAMB. REF. AD DETAILS
321 A	VESTIBULE 321	950	2150	-	Y	F	ALUM.	ANNO.	TP	CW16	ALUM.	ANNO.	Y	TP	B/F OPERATOR, COORDINATE DOOR WITH CURTAIN WALL MANUFACTURER.
322 A	STORAGE 322	950	2150	-	-	A	WD	PLAM	-	1	HM	P	-	-	
322 B	STORAGE 322	950	2150	-	-	A	WD	PLAM	-	1	HM	P	-	-	
323 A	TODDLER 323	950	2150	-	-	D	WD	PLAM	TP	1	HM	P	-	-	
323 B	TODDLER 323	950	2150	-	Y	B	HM	P	TP	1	HM	P	-	-	B/F OPERATOR
324 A	WASHROOM 324	950	1200	-	-	E	WD	PLAM	-	3A	HM	P	-	TP	HALF DOOR, COORD. WIDTH WITH WOOD JAMB. REF. AD DETAILS

DOOR #	ROOM	DOOR								FRAME					REMARKS
		WIDTH	HEIGHT	FIRE	H.T.	TYPE	MAT'L	FIN	GLASS	TYPE	MAT'L	FIN	DC	GLASS	
325 A	CHILDCARE STORAGE 325	1000	2150	-	-	A	HM	P	-	1	HM	P	-	-	INSULATED DOOR & FRAME
TEACHER'S CLOSET LOCKSET (1ST FLOOR) - REFER TO FLOOR PLANS FOR QUANTITY (DOUBLE HANDLES, LEVER TYPE)															
SECOND FLOOR															
201 A	STAIR C 201	2X1000	2150	45MIN	Y	C	HM	P	FRG	6A	HM	P	-	-	ELECTROMAGNETIC HOLD OPENS COORD. WITH ELECTRICAL, REMOVEABLE MULLION
204 A	SEMINAR 3 204	950	2150	-	-	D	WD	P	TP	1	HM	P	-	-	
206 A	MECHANICAL ROOM 206	950	2150	45MIN	-	A	HM	P	-	1	HM	P	-	-	
206 B	MECHANICAL ROOM 206	1100	2150	45MIN	-	A	HM	P	-	1	HM	P	-	-	
207 A	CLASSROOM 3 207	950	2150	-	-	D	WD	PLAM	TP	2	HM	P	-	TP	
208 A	CLASSROOM 4 208	950	2150	-	-	D	WD	PLAM	TP	1	HM	P	-	-	
209 A	STAIR A 209	2X1000	2150	45MIN	Y	C	HM	P	FRG	4	HM	P	-	-	180 DEGREE SWING 1 LEAF, ELECTROMAGNETIC HOLD OPENS
210 A	CLASSROOM 5 210	950	2150	-	-	D	WD	PLAM	TP	1	HM	P	-	-	
211 A	CLASSROOM 6 211	950	2150	-	-	D	WD	PLAM	TP	1	HM	P	-	-	
212 A	CLASSROOM 7 212	950	2150	-	-	D	WD	PLAM	TP	1	HM	P	-	-	
215 A	IT 215	950	2150	-	-	A	HM	P	-	1	HM	P	-	-	
216 A	CUST. 216	950	2150	-	-	A	HM	P	-	1	HM	P	-	-	
217 A	BARRIER-FREE WR 217	950	2150	-	-	A	HM	P	-	1	HM	P	-	-	
218 A	WASHROOM 218	950	2150	-	-	A	HM	P	-	1	HM	P	-	-	
220 A	CLASSROOM 8 220	950	2150	-	-	D	WD	PLAM	TP	1	HM	P	-	-	

DOOR #	ROOM	DOOR								FRAME					REMARKS
		WIDTH	HEIGHT	FIRE	H.T.	TYPE	MAT'L	FIN	GLASS	TYPE	MAT'L	FIN	DC	GLASS	
221 A	CLASSROOM 9 221	950	2150	-	-	D	WD	PLAM	TP	1	HM	P	-	-	
221 B	CLASSROOM 9 221	950	2150	-	-	D	WD	PLAM	TP	9	HM	P	-	TP	
222 A	SEMINAR 5 222	950	2150	-	-	D	WD	PLAM	TP	10	HM	P	-	TP	
223 A	CLASSROOM 10 223	950	2150	-	-	D	WD	PLAM	TP	1	HM	P	-	-	
223 B	CLASSROOM 10 223	950	2150	-	-	D	WD	PLAM	TP	9	HM	P	-	-	
224 A	CLASSROOM 11 224	950	2150	-	-	D	WD	PLAM	TP	1	HM	P	-	-	
225 A	CLASSROOM 12 225	950	2150	-	-	D	WD	PLAM	TP	1	HM	P	-	-	
226 A	CLASSROOM 13 226	950	2150	-	-	D	WD	PLAM	TP	1	HM	P	-	-	
227 A	STAIR B 227	2X1000	2150	45MIN	Y	C	HM	P	FRG	4	HM	P		-	180 DEGREE SWING, ELECTROMAGNETIC HOLD OPENS
228 A	ACAD STORAGE 228	950	2150	-	-	A	WD	PLAM	-	1	HM	P	-	-	
229 A	WORKROOM 229	950	2150	-	-	D	WD	PLAM	TP	1	HM	P	-	-	
230 A	CLASSROOM 14 230	950	2150	-	-	D	WD	PLAM	TP	1	HM	P	-	-	
231 A	CLASSROOM 15 231	950	2150	-	-	D	WD	PLAM	TP	1	HM	P	-	-	
232 A	CLASSROOM 16 232	950	2150	-	-	D	WD	PLAM	TP	1	HM	P	-	-	
233 A	CLASSROOM 17 233	950	2150	-	-	D	WD	PLAM	TP	1	HM	P	-	-	
233 B	CLASSROOM 17 233	950	2150	-	-	D	WD	PLAM	TP	11	HM	P	-	-	
234 A	SEMINAR 6 234	950	2150	-	-	D	WD	PLAM	TP	10	HM	P	-	-	

DOOR #	ROOM	DOOR								FRAME					REMARKS
		WIDTH	HEIGHT	FIRE	H.T.	TYPE	MAT'L	FIN	GLASS	TYPE	MAT'L	FIN	DC	GLASS	
235 A	CLASSROOM 18 235	950	2150	-	-	D	WD	PLAM	TP	1	HM	P	-	-	
235 B	CLASSROOM 18 235	950	2150	-	-	D	WD	PLAM	TP	11	HM	P	-	-	
236 A	CLASSROOM 19 236	950	2150	-	-	D	WD	PLAM	TP	1	HM	P	-	-	
237 A	CLASSROOM 20 237	950	2150	-	-	D	WD	PLAM	TP	1	HM	P	-	-	
238 A	SCIENCE 238	950	2150	-	-	D	WD	PLAM	TP	1	HM	P	-	-	
239 A	ART 239	950	2150	-	-	D	WD	PLAM	TP	1	HM	P	-	-	
240 A	STORAGE 240	950	2150	-	-	A	HM	P	-	1	HM	P	-	-	
241 A	STORAGE 241	950	2150	-	-	A	HM	P	-	1	HM	P	-	-	
242 A	MUSIC 242	950	2150	-	-	D	WD	PLAM	TP	1	HM	P	-	-	
243 A	MECH. MEZZANINE 243	950	2150	-	-	A	HM	P	-	1	HM	P	Y	-	INSULATED DOOR & FRAME
244 A	STORAGE 244	950	2150	-	-	A	HM	P	-	1	HM	P	-	-	

TEACHER'S CLOSET CYLINDER LOCK (1ST FLOOR) - REFER TO FLOOR PLANS FOR QUANTITY

Part 1 General

1.1 RELATED SECTIONS

.1 Section 01 33 00 Submittal Procedures.

.2 Section 08 44 13 Glazed Aluminum Curtain Wall.

.3 Section 08 80 50 Glazing.

1.2 REFERENCES

.1 American Architectural Manufacturers Association (AAMA):
- .1 AAMA 2605-05, Voluntary Specification for High Performance Coatings on Architectural Extrusions and Panels.
- .2 AAMA CW-10-04, Care and Handling of Architectural Aluminum from Shop to Site.

.2 American National Standards Institute (ANSI):
- .1 ANSI, H35.1M-2009, Alloy and Temper Designation Systems for Aluminum (Metric).

.3 American Society for Testing and Materials (ASTM):
- .1 ASTM A167-99(2009), Specification for Stainless and Heat-Resisting Chromium-Nickel Steel Plate, Sheet and Strip.
- .2 ASTM B221M-08, Specification for Aluminum-Alloy Extruded Bars, Rods, Wires, Shapes and Tubes.
- .3 ASTM F738M-02(2008), Specification for Stainless Steel Metric Bolts, Screws, and Studs.

.4 Canadian General Standards Board (CGSB):
- .1 CAN/CGSB-1.108-M89, Bituminous Solvent Type Paint.

.5 Canadian Standards Association (CSA):
- .1 CSA W59-M-03(R2008), Welded Steel Construction (Metal Arc Welding).

1.3 DESIGN REQUIREMENTS

.1 Design aluminium doors in accordance with the Climatic Design Data for the project location in accordance with the Ontario Building Code:
- .1 Design temperature: January 1%, July 2 1/2% .
- .2 Hourly wind pressures: 1 in 50 year occurrence.

.2 Design aluminium doors to accommodate following without producing detrimental effect:
- .1 Cyclic 40 degrees C daily thermal swing of components.
- .2 Cyclic, dynamic loading and release of loads such as wind loads.
- .3 13 mm vertical deflection in supporting structure and movement of supporting structure due to live, dead load, and creep or deflections, seismic load, sway displacement and similar items.

.3 Prevent deflection and permanent or progressive glazing displacement. Restrict horizontal and vertical deflection to less than L/175 (under uniformly distributed positive design wind load), and 10 mm maximum regardless of span.

1.4 SUBMITTALS

.1 Shop drawings:
- .1 Submit shop drawings in accordance with the Section 01 33 00 indicating:
  - .1 Plans, sections, details, type of extrusions, profiles, anchorage, glazing details, and finishes.
  - .2 Section and hardware reinforcement.

.2 Samples:
- .1 Submit sampled in accordance with the Section 01 33 00 of the following:
  - .1 One complete corner detail of door frame, glazing, and finish for each door type.
  - .2 Each door hardware item for the Consultant's approval.

.3 Reports:
- .1 Submit substantiating engineering data, and independent test results of pre-tested, existing doors to substantiate compliance with the design criteria.
- .2 Submit documentation to substantiate ten years of experience in aluminum door manufacture and installation.

1.5 DELIVERY, STORAGE, AND HANDLING

.1 Handle aluminum work in accordance with AAMA CW-10.

.2 Protect aluminum surfaces with strippable coating. Do not use adhesive papers or sprayed coatings which bond when exposed to sunlight or weather. Do not remove before final cleaning of building.

Part 2 Products

2.1 ACCEPTABLE MANUFACTURER(S) AND SYSTEM(S)

.1 Aluminum doors:
- .1 Interior:
  - .1 '400A Series' by Alumicor Limited.
  - .2 '350 Swing Doors' by Kawneer Company Canada Limited.
  - .3 Or approved alternative.
- .2 Exterior:
  - .1 '400A Insuldoor' by Alumicor Limited.
  - .2 '360 Insulclad Doors' by Kawneer Company Canada Limited.
  - .3 Or approved alternative.

2.2 MATERIALS

.1 General:
- .1 All materials under Work of this Section, including but not limited to, sealants and coatings are to have low VOC content limits.
- .2 Wherever possible, metals used in work of this Section are to contain recycled content.

.2 Aluminum extrusions and channels: ASTM B211 and ANSI H35.1 AA6063 alloy, T6 temper.

.3 Reinforcements and anchors: ASTM A167, Type 304 to AISI No. 2B finish. Size as shown.

.4 Glass and glazing materials: As specified in Section 08 80 50.

.5 Frame sealant: Type as recommended by the aluminum work manufacturer.

.6 Screws, bolts and other fasteners: ASTM F738M; Stainless Steel Type 304.

.7 Isolation coating: CAN/CGSB-1.108-M; Bitumastic coating, acid and alkali resistant material.

.8 Foam insulation: One component polyurethane foam for installation within closures and fillers; Enerfoam by Dow Chemical Canada Inc.

.9 Weatherstripping: Durable, non-absorbing material resistant to deterioration by aging and weathering.

.10 Door hardware: Supplied by Section 08 71 00, preparation and installation by this Section.

2.3 FABRICATION

.1 Fabricate sections true to detail, free from defects impairing appearance, strength and durability. Fabricate extrusions with sharp, well defined corners.

.2 Fabricate, fit, and secure framing joints and corners accurately, with flush surfaces, and hairline joints. Apply frame sealant at joints for weatherproof seams.

.3 Conceal anchors, reinforcement and attachments from view. Fabricate reinforcement in accordance with design requirements.

.4 Do not expose manufacturer's identification labels on aluminum assemblies.

.5 Fabricate doors and frames complete with internal reinforcements, cut-outs, and recesses to accommodate finish hardware. Reinforce cut-outs to assure adequate strength.

.6 Double weatherstrip doors. Install weatherstripping in specially extruded ports and secure to prevent shrinkage or movement.

.7 Fabricate doors of welded construction.

.8 Glazing stop: Square, snap-on type, designed for neoprene glazing system.

2.4 FINISH

.1 Extrusion finish: Clear anodized to AAMA 611 per Aluminum Association Designation System for Aluminum Finishes AA-M12C22A41.

Part 3 Execution

3.1 INSTALLATION

.1 Install aluminum doors in accordance with reviewed shop drawings, and manufacturer's written instructions.

.2 Install Work of this Section securely, in correct location, level, square, plumb, at proper elevations, free of warp or twist.

.3 Apply isolation coating at 0.8 mm dry film thickness to prevent corrosive or electrolytic action between dissimilar materials such as aluminum to concrete, masonry, galvanized steel and similar conditions.

.4 Fill voids between aluminum framing and adjacent construction with foam insulation.

.5 Install aluminum door manufacturer's standard weatherstripping at door frame perimeter. Install weatherstripping throughout entire length and width of doors at jambs and heads.

.6 Install doors and hardware to manufacturers' written instructions. Clean and adjust hardware for correct performance.

.7 Adjust operable parts for correct function.

.8 Remove damaged or unacceptable Products and assemblies from Site and replace to Consultant's acceptance.

.9 Install glass presence markers, in two cross stripes extending from diagonal corners. Maintain markers until final clean-up.

3.2 CLEANING

.1 Maintain aluminum doors, inside and outside, in clean condition throughout construction period.

.2 Remove labels, protective material, and glass presence markers from prefinished surfaces.

END OF SECTION

Part 1 General

1.1 RELATED SECTIONS

1. Section 08 71 10 – Door Hardware
2. Section 10 11 25 – Manufactured Specialties Item 2.1.14

1.2 REQUIRMENTS OF REGULATORY AGENCIES

1. Fabricate and install all doors to the following standards. AWMAC Quality Standards for Architectural Woodwork, latest edition
2. CAN/CSA-0132.2 Series-90, Wood Flush Doors
3. CAN4-S104-M80, fire tests of door assemblies
4. CAN4-S105-M85, Fire Door Frames
5. NFPA-80, Fire doors and Windows, latest edition.

1.3 SAMPLES

1. Submit samples in accordance with Section 01 33 00
2. Submit one 12” x 12” corner sample of each type of door
3. Show door construction, core, glazing details and faces.

1.4 SHOP DRAWINGS

1. Submit shop drawings in accordance with Section 01300 Submittals.

1.5 GUARANTEE

1. All doors shall be fully guaranteed for a period of three (3) years against manufacturing defects, core ghosting and warping, delamination of veneer, after Substantial Completion.

Part 2 General

2.1 MATERIALS

1. Acceptable door manufacturers:
   - .1 Algoma
   - .2 Cambridge
   - .3 Dormond

.4 Lambton

.5 Marshfield

2. Doors shall be of the sizes, thickness and type as shown on the drawings.

3. Solid core doors shall be constructed with urea-formaldehyde free particle board to ANSI A208.1, lD2. For Fire rated doors provide core in accordance with fire test requirements..

4. Doors shall be provided with vision panels as called for on the Door Schedules and supplied complete with wood glazing stops for 20 minute rated doors and ULC approved metal glazing stops for 45 minute or 60 minute rated doors.

5. Doors shall be complete with labels indicating approved fire resistance rated as required.

6. Undercut or rebate bottom rails as required.

7. Crossband – 3 ply hardwood plywood not less than 1/8" thick before sanding

8. Vertical and horizontal edges, stops and beads for glass and grilles to match face veneer. Edges shall be minimum 1 ½" wide by thickness of door.

9. Stiles and rails to be low density softwood staved type minimum 1 ½" wide with ¾" thick hardwood edge banding. Moisture content shall not exceed 8%.

10. Glazing beads to be flush type front edge recessed 1/8" at bottom. Mitre cut and fil all corners to form tight flush joints.

11. Face veneer shall be plastic laminate from Nevamar Plastic Laminate ARP surface distributed by McFaddens. Approved alternates by Wisonart, Formica or Arborite. Allow for maximum of 2 colours from full range, including solids and wood grains as chosen by Consultant.

12. Colours to later selection by Consultant as specified in Plastic Laminates.

2.2 FABRICATION

1. Door cores unframed, solid laminated wood stave core construction, comprising narrow pieces of kiln dried wood, grain running vertically and end joints well staggered, solid, (no voids) and electronically glue bonded. Floating core construction will not be accepted. Sand door cores boths sides prior to application of faces.

2. If particle board core or fire rated cores used, frame with 1 1/8" minimum wood stiles and 2 ¾" minimum wood rails; edge stiles with birch ¾" wide minimum, full length piece. Glue tiles and rails to core and apply face veneer and machine flush with door edges.

3. Seal tope and bottom edges with two coats urethane finish or lacquer applied to door manufacturer's plant.

4. Attach ULC labels to fire doors and frames as required

5. Preparation of doors shall include provision for extra hinges, heavy weight butts and mortised or cylinder locksets as required of hardware tender documents.

6. Preparation of doors and frames shall make appropriate provision for sound seals as indicated on Door Schedule.

7. Prepare glazing stops to receive insulated, sealed glazing as required on Door Schedule.

Part 3 Execution

3.1 FITTING AND HANGING DOORS

1. Doors shall be delivered to site, protected in transit from any damage from weather or handlying and similarly stored in a protected area until hung in place.

2. Doors shall be hung by skilled carpenters.

3. Any planning of edges required for proper installation shall be sanded smooth prior to final installation.

4. Neatly and accurately fit required finishing hardware. Refer to section 08 71 10 - Finishing Hardware.

5. The completed installation required all doors to fit accurately in their frames, swing easily without binding and close slugly without movement when latch is engaged.

3.2 HARDWARE INSTALLATION

.1 Receive hardware from Section 08 71 10.

.2 Installation of the hardware is the responsibility of the General Contactor.

.3 Adjust for correct function.

END OF SECTION

Part 1 General

1.1 RELATED SECTIONS

.1 Section 01 33 00 - Submittal Procedures.

.2 Section 01 61 00 - Common Product Requirements.

.3 Section 01 78 00 - Closeout Submittals.

.4 Section 05 50 00 - Metal Fabrications: Metal fabricated framed openings, structural support framing for sloped glazing.

.5 Section 07 27 10 - Air Barriers - Descriptive or Proprietary.

.6 Section 07 84 00 - Firestopping: Fire safing between floor edge and curtain wall system.

.7 Section 07 92 10 - Joint Sealing: System perimeter sealant and back-up materials.

.8 Section 08 80 50 - Glazing.

.9 Section 09 91 23 - Interior Painting: Field painting of interior surface of infill.

1.2 REFERENCES

.1 Aluminum Association Designation System For Aluminum Finishes (AA)-[1997].

.1 DAF 45 [2003], Designation System For Aluminum Finishes.

.2 American Architectural Manufacturers Association (AAMA).

.1 AAMA CW-DG-1-[96], Aluminum Curtain Wall Design Guide Manual.

.2 AAMA CW-10-[97], Care and Handling of Architectural Aluminum From Shop to Site.

.3 AAMA CW-11-[85], Design Wind Loads for Buildings and Boundary Layer Wind Tunnel Testing.

.4 AAMA T1R-A1-[02], Sound Control for Fenestration Products.

.5 AAMA 501-[94], Methods of Test for Exterior Walls.

.6 AAMA 503-[92], Voluntary Specification for Field Testing of Metal Storefronts, Curtain Wall and Sloped Glazing Systems.

.7 AAMA 611-[98], Voluntary Specifications for Anodized Finishes Architectural Aluminum.

.8 AAMA 612-[02], Voluntary Specifications, Performance Requirements, and Test Procedures for Combined Coatings of Anode Oxide and Transparent Organic Coatings on Architectural Aluminum.

.9 AAMA 2603-[02], Voluntary Specification Performance Requirements and Test Procedures for Pigmented Organic Coatings on Aluminum Extrusions and Panels.

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.10 AAMA 2604-[02], Voluntary Specification Performance Requirements and Test Procedures for High Performance Organic Coatings on Aluminum Extrusions and Panels.

.3 American Society for Testing and Materials International, (ASTM).

.1 ASTM A36/A36M-[103a], Specification for Carbon Structural Steel.

.2 ASTM A123/A123M-[02], Specification for Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products.

.3 ASTM A167-[99], Specification for Stainless and Heat-Resisting Chromium-Nickel Steel Plate, Sheet, and Strip.

.4 ASTM A653/A653M-[03], Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process.

.5 ASTM B209-[02a], Specification for Aluminum and Aluminum-Alloy Sheet and Plate.

.6 ASTM B221-[02], Specification for Aluminum-Alloy Extruded Bars, Rods, Wire, Profiles, and Tubes.

.7 ASTM E283-[91(1999)], Test Method for Determining the Rate of Air Leakage Through Exterior Windows, Curtain Walls, and Doors Under Specified Pressure Differences Across the Specimen.

.8 ASTM E330-[02], Standard Test Method for Structural Performance of Exterior Windows, Doors, Skylights, and Curtain Walls, by Uniform Static Air Pressure Difference.

.9 ASTM E331-[00], Standard Test Method for Water Penetration of Exterior Windows, Skylights, Doors, and Curtain Walls, by Uniform Static Air Pressure Difference.

.10 ASTM E413-[87(1999)], Classification for Rating Sound Insulation.

.11 ASTM E1105-[00], 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.

.4 Canadian General Standards Board (CGSB).

.1 CAN/CGSB 1.108-[M89], Bituminous Solvent Type Paint.

.2 CAN/CGSB-12.20-[M89], Structural Design of Glass for Buildings.

.5 Canadian Standards Association (CSA International).

.1 CSA-G40.20/G40.21-[98(R2003)], General Requirements for Rolled or Welded Structural Quality Steel/Structural Quality Steels.

.2 CAN/CSA-G164-[M92(R2003)], Hot Dip Galvanizing of Irregularly Shaped Articles.

.3 CSA-S136-[01], North American Specification for the Design of Cold-Formed Steel Structural Members.

.4 CAN3-S157-[M83(R2002)], Strength Design in Aluminum.

.5 CSA W59.2-[M1991(R2003)], Welded Aluminum Construction.

.6 Environmental Choice Program (ECP).

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.1 CCD-45-[95], Sealants and Caulking Compounds.

.2 CCD-47-[1998], Surface Coatings.

.3 CCD-48-[95], Recycled Water-Borne Surface Coatings.

.7 Society for Protective Coatings (SSPC).

.1 SSPC - Paint 20 Zinc Rich Coating.

.2 SSPC - Paint 25 Alkyd, Zinc Oxide Linseed Oil and Primer for Use Over Hand Cleaned Steel Type 1 and Type 2.

1.3 SYSTEM DESCRIPTION

.1 Work included: Furnish labour, materials and other services to complete the fabrication and installation of the framing, including all materials and fitments required for the operation of any entrance units included, in the manner, direction and performance shown on the shop drawings and specified herein. Work not included: Structural support of framing, interior trims. Related work specified elsewhere.

1.4 QUALITY ASSURANCE

.1 Installation crews engaged or provided by the approved supplier shall have proven experience specifically trained and qualified in this work (written proof of minimum of five (5) years employment or service with the window manufacturer or similar manufacturer). Individuals are to be either employees of the manufacturer and/or workers approved by the manufacturer.

.2 Provide one (1) thoroughly experienced. reliable, qualified and competent foreman in charge of the work to be on site at all times when work is taking place. Individual to be designated in charge from start of activities on site until final deficiencies are complete. Foreman may only be changed by written approval *or request* of the Consultant or owner.

.3 Window supplier is to have adequate plant and skilled tradesmen and is known to have manufactured and installed similar windows for a minimum of five (5) years in the Province of Ontario.

1.5 PERFORMANCE REQUIREMENTS

.1 Structural performance shall be based on CSA standard CAN3-S157 "Strength Design in Aluminum" and a maximum deflection of 1/175 of the span.

.2 Air infiltration shall not exceed 0.06 cfm/ft2 (0.0003 m3/s-m2) when tested in accordance with ASTM E283 at a pressure differential of6.24p.s.f. (300 Pa.)

.3 There shall be no water infiltration when tested in accordance with ASTM E331 with a pressure differential of 15.0 p.s.f. (720 Pa.) Thermally, the grid members shall have a condensation resistance equal to or better than the area along the bottom of a 1" sealed glass unit with standard metal spacer edge construction.

.4 Size glass units and glass dimensions to limits established in CAN/CGSB-12.20.

.5 Provide system to accommodate, without damage to components or deterioration of seals:

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.1 Movement within system.

.2 Movement between system and perimeter framing components.

.3 Dynamic loading and release of loads.

.4 Deflection of structural support framing.

.5 Shortening of building concrete structural columns.

.6 Creep of concrete structural members.

.6 Vapour seal with interior atmospheric pressure of 25 mm sp, 22 degrees C, 40% RH: No failure.

.7 Drain water entering joints, condensation occurring in glazing channels, or migrating moisture occurring within system, to the exterior by a weep drainage network.

.8 Ensure no vibration harmonics, wind whistles, noises caused by thermal movement, thermal movement transmitted to other building elements, loosening, weakening, or fracturing of attachments or components of system occur.

1.6 PRODUCT DATA

.1 Submit product data in accordance with Section 01 33 00 - Submittal Procedures.

.2 Provide component dimensions; describe components within assembly, anchorage and fasteners, glass and infill, internal drainage details and water flow diagrams.

1.7 SHOP DRAWINGS

.1 Submit shop drawings in accordance with Section 01 33 00 - Submittal Procedures.

.2 Indicate system dimensions, framed opening requirements and tolerances, internal million reinforcement, adjacent construction, anchor details anticipated deflection under load, affected related Work, weep drainage network, expansion and contraction joint location and details, and field welding required.

.3 Curtain wall shop drawings are to be approved for structural integrity by a Professional Engineer licensed to design structures in the Province of Ontario. Shop drawings are to bear Engineer’s seal of approval.

1.8 SAMPLES

.1 Drawings and specifications for work of this section are based upon Thermawall 2600 series Curtain Wall system by Alumicor. For all approved products and acceptable alternatives, submit supporting technical literature, samples, drawings and performance data to meet or exceed these specifications.

.2 Submit two samples 800 x 800 mm in size illustrating prefinished aluminum surface, finish, colour, texture, specified glass units, insulated infill panels, glazing materials illustrating edge and corner.

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1.9 DESIGN DATA

.1 Submit design data in accordance with Section 01 33 00 - Submittal Procedures.

.2 Provide framing member structural and physical characteristics, calculations, dimensional limitations, special installation requirements.

1.10 TEST REPORTS

.1 Submit test reports in accordance with Section 01 33 00 - Submittal Procedures.

.2 Submit substantiating engineering data, test results of previous tests by independent laboratory which purport to meet performance criteria, and supportive data.

1.11 REGULATORY REQUIREMENTS

.1 Conform to applicable code for acoustic attenuation, and sound transmission.

.2 Use the following paragraph for assessing full sized erected assemblies for review of construction, coordination of work of several sections, testing, or observation of operation. A mock-up may also be used for assessing field applied finishes.

1.12 MOCK-UP

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

.2 Locate where directed.

.3 Allow 24 hours for inspection of mock-up Consultant before proceeding with work.

.4 When accepted, mock-up will demonstrate minimum standard for this work. Mock-up may not remain as part of finished work.

1.13 PRE-INSTALLATION MEETING

.1 Convene one week before starting work of this section.

1.14 DELIVERY, STORAGE, AND HANDLING

.1 Deliver, store, handle and protect materials in accordance with Division 1 requirements.

.2 Handle work of this section in accordance with AAMA CW-10.

.3 Protect prefinished aluminum surfaces with wrapping. Do not use adhesive papers or sprayed coatings which bond when exposed to sunlight or weather.

1.15 ENVIRONMENTAL REQUIREMENTS

.1 Do not install sealants when ambient and surface temperature is less than 5 degrees C.

.2 Maintain this minimum temperature during and after installation of sealants.

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1.16 SEQUENCING

.1 Coordinate work of this section with installation of fire stopping, air barrier placement, vapour retarder placement, flashing placement, installing ductwork to rear of louvers.

1.17 WARRANTY

.1 Submit a manufacturer's warranty against defects in materials and workmanship covering the components of the window system for a period of ten (10) years. The manufacturer shall supply a non-pro-rated warranty covering labour, materials, tools and equipment to repair and/or replace any materials defects at no additional cost, for a period of ten (10) years including defects or failures due to poor workmanship and installation.

.2 The supplier shall also submit a warrantee, in accordance with Section 088050-Glazing, for 10 years warranting the sealed units against defects.

1.18 MAINTENANCE DOCUMENTS AND MATERIALS

.1 Provide 2 copies of data for maintenance and routine cleaning.

.2 Provide 2 copies of final record reviewed shop drawings for owner's records.

.3 Contractor shall supply all accessories as may be required for the operation and performance of the windows system.

1.19 EXTRA MATERIALS

.1 Provide extra materials of glass units in accordance with Section 01 78 00 - Closeout Submittals.

.2 Provide protected and packaged in wood crates suitable for storage. Clearly identify each crate.

.3 Deliver Consultant, upon completion of the work of this section.

.4 Store where directed by Consultant.

1.20 WASTE MANAGEMENT AND DISPOSAL

.1 Remove from site and dispose of packaging materials at appropriate recycling facilities.

Part 2 Products

2.1 MATERIALS

.1 **Exterior Curtain Walls** – Alumicor Thermawall 2600 or Kawneer 1600UT, Ultra Thermal Performance curtain wall, (63.5 mm x 190.5mm – incl. glazing & cap).

.1 Must be designed to withstand a wind load of min. 30 psf.

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.2 Provide high thermal performance gaskets.

.3 Fixed (non opening) thermally broken anodized aluminum curtain wall system, glazed with tempered, insulating vision glass and tempered spandrel glass.

.4 Standard pressure cap for most locations.

.5 Deep Pressure Cap: Provide 150mm extended pressure cap where noted on drawings.

.6 Provide double width mullion where required (near main entrance).

.7 Provide Structural Silicone Mullion (SSG) where noted on drawings. Back section depth to match capped assembly where noted in drawings.

.8 Provide operable 'phantom vent 5000' where indicated on drawings.

.9 Provide insect screens to operable vents at Learning Commons and Art Classrooms.

.2 **Interior Curtain Walls** - Drawings and Details are based on Alumicor Versawall 2500 (non-thermal) curtain wall, (63.5 mm x 153mm – incl. glazing & cap).

.1 Fixed (non opening) anodized aluminum curtain wall system, glazed with tempered, vision glass and tempered spandrel glass.

.3 Acceptable Materials : Curtain wall systems meeting or exceeding these specifications manufactured by:

.1 Aerloc Industries
.2 Alwind Industries
.3 Windspec Inc.

.4 Extrusions shall be 6063 T54 alloy and temper.

.5 Formed aluminum components shall be sheet of alloy and temper suitable for their purpose and finish.

.6 Fasteners shall be 300 series stainless steel or 400 series stainless steel cadmium plated and of sufficient size and quantity to perform their intended function.

.7 Weathering and glazing gaskets shall be extruded, black, closed cell or dense elastomer of durometer appropriate to the function.

.8 Provide glazed and aluminum spandrel sections where indicated on drawings.

.9 Provide structural silicone mullions where described on drawings.

.10 Refer to Section 08 80 50 – Glazing for information on tinted glazing sections. Refer to drawings for locations of tinted glazing.

.11 Manufacturer / Installer to determine if mullions require internal reinforcement to achieve specified load resistance.

□

2.2 FINISHES

.1 CLEAR ANODIZED.

.1 Exposed aluminum sections shall be given an anodic oxide treatment in accordance with Aluminum Association specification AA-M12C22A31: “Clear anodized”.

2.3 FABRICATION

.1 Fabricate aluminum work in accordance with reviewed shop drawings and manufacturer’s written instructions.

.2 Fabricate framing from extrusions of size and shape shown on shop drawings.

.3 Vertical and horizontal members shall be tubular extrusions designed for shear block comer construction.

.4 All joints shall be accurately machined, assembled and sealed to provide neat weather tight joints. Shielded drainage and pressure equalization vents shall be provided where required. AH horizontal members shall be sealed to vertical members to provide individual compartments within the system in accordance with the rain screen principle.

.5 Fabricate system components with minimum clearances and shim spacing around perimeter of assembly, yet enabling installation and dynamic movement of perimeter seal.

.6 Accurately fit and secure joints and corners. Make joints flush, hairline, and weatherproof.

.7 Prepare components to receive anchor devices. Install anchors.

.8 Arrange fasteners and attachments to ensure concealment from view.

.9 Reinforce framing members for external imposed loads.

.10 Visible manufacturer's identification labels not permitted.

.11 Break shapes must be approved by the Consultant prior to use.

.12 At all curtain wall spandrel panels exposed on interior of building, curtain wall spandral panels shall be laminated w/ aluminum panel of same pre-finish as mullions with bent edges.

.13 Provide spandrel panels at locations of exterior light fixtures as shown on elevations. Coordinate with Div. 16 for lighting location and size of openings.

.14 All perimeter sections to be tubular/closed back sections for continuous adhesion and continuity of building envelope membrane.

.15 Spandrel panels:

.1 Fabricate insulated spandrel panel inner facing of 20 gauge aluminum sheet. Wrap edges with aluminum sheet, enabling installation and minor movement of perimeter seal.

.2 Accurately fit and secure joints and corners. Make joints flush, hairline, and weatherproof.

.3 Place insulation within panel, adhered to exterior face of interior panel sheet over entire area of sheet with impale fasteners.

.4 Provide integral reinforcing and stiffeners as required to reinforce panel against deflection caused by wind and suction loads.

.5 Provide non-metallic spacers as necessary to separate dissimilar metals.

.6 Ventilate and pressure equalize the air space outside the exterior surface of the insulation, to the exterior.

.7 Arrange fasteners and attachments to ensure concealment from view.

.8 Glass panels: Consists of spandrel glass in accordance with Section 08 80 00 to the exterior with insulated backpan to the inside. Interior face of panel to be finished with a pre-finished aluminum sheet of the same grade as the exterior, colour matching the exterior. Insulation thickness shall be as indicated, retained with stick clips. Seal all joints in shop with high grade butyl sealant, including perimeter seal at backpan. Colour to later selection by Consultant.

.9 Metal panels: Consists of an exterior prefinished flush aluminum panel with panel stiffeners as required, to match colour of window framing, with insulation core thickness as indicated and galvanized sheet back-pan. Interior face of panel to be finished with a pre-finished aluminum sheet of the same grade as the exterior, colour matching the exterior.

Part 3 Execution

3.1 EXAMINATION

.1 Verify dimensions, tolerances, and method of attachment with other work.

.2 Verify wall openings and adjoining air barrier and vapour retarder materials are ready to receive work of this section.

3.2 INSTALLATION

.1 Framing shall be installed, glazed and adjusted by experienced personnel in accordance with the manufacturer's instructions and approved shop drawings. All items in this section shall be set in their correct location and shall be set level, square, plumb and at proper elevations and in alignment with other work.

.2 Attach to structure to permit sufficient adjustment to accommodate construction tolerances and other irregularities.

.3 Provide alignment attachments and shims to permanently fasten system to building structure. Clean weld surfaces; apply protective primer to field welds and adjacent surfaces.

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.4 Align assembly plumb and level, free of warp or twist. Maintain assembly dimensional tolerances and align with adjacent work.

.5 Provide thermal isolation where components penetrate or disrupt building insulation.

.6 Co-ordinate attachment and seal of perimeter air barrier and vapour retarder materials.

.7 Pack fibrous insulation in shim spaces at perimeter of assembly to maintain continuity of thermal barrier.

.8 Install fire-safing in areas as indicated.

3.3 FIELD QUALITY CONTROL

.1 Inspection will monitor quality of installation and glazing.

.2 Test to ASTM E1105, and AAMA 501.

.3 Evaluate installed system by thermo-photographic scan.

3.4 ADJUSTING

.1 Adjust operating sash for smooth operation.

3.5 CLEANING

.1 Remove protective material from prefinished aluminum surfaces.

.2 Wash down surfaces with a solution of mild detergent in warm water, applied with soft, clean wiping cloths. Take care to remove dirt from corners. Wipe surfaces clean.

.3 Remove excess sealant by moderate use of mineral spirits or other solvent acceptable to sealant manufacturer.

3.6 PROTECTION

.1 Protect finished Work from damage.

.2 Where aluminum will contact dissimilar metals, protect against galvanic action by painting contact surfaces with primer or by applying sealant or tape recommended by manufacturer for this purpose. Where aluminum will contact concrete or masonry, protect against corrosion by painting contact surfaces with bituminous paint."

END OF SECTION

□

Part 1 General

1.1 RELATED SECTIONS

.1 Section 01 33 00 - Submittal Procedures.

.2 Section 01 74 11 – Final Cleaning.

.3 Section 08 80 50 – Glazing.

.4 Section 07 92 10 - Joint Sealing: caulking of joints between frames and other building components.

1.2 REFERENCES

.1 Aluminum Association (AA), Designation System for Aluminum Finishes (2000)

.2 Canadian General Standards Board (CGSB)

.1 CAN/CGSB-1.40-[97], Anticorrosive Structural Steel Alkyd Primer.

.2 CAN/CGSB-79.1-[M91], Insect Screens.

.3 Canadian Standards Association (CSA) International

.1 CSA-A440-[00]/A440.1-[00], A440-[00], Windows / Special Publication A440.1-[00], User Selection Guide to CSA Standard A440-[00], Windows.

.2 CAN/CSA-G164-[M92(R1998)], Hot Dip Galvanizing of Irregularly Shaped Articles.

.3 CAN/CSA-Z91-[M90(R2000)], Safety Code for Window Cleaning Operations.

1.3 SYSTEMS AND MANUFACTURERS

.1 Drawings and details are based on 1970 Series with 1350 Series Vents as manufactured by Alumicor Ltd.

.2 Approved exterior window systems meeting or exceeding these specifications by the following manufacturers are to be supplied:

.1 Aerloc Industries
.2 Alwind Industries
.3 Windspec Inc.

.3 Work of this Section must be designed by a Professional Engineer licensed to design structures in the Province of Ontario.

.4 By submitting a price for supply and install; the Contractor for work to this section shall guarantee that he has carried products and pricing from one of the above approved manufacturers.

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.5 All curtain wall framing has been drawn using a nominal 5-1/4" framing and set back 30mm from brick veneer face.

.6 All punch window framing has been drawn using a nominal 6" framing and set back 60mm from brick veneer face.

1.4 QUALITY ASSURANCE

.1 Installation crews engaged or provided by the approved supplier shall have proven experience specifically trained and qualified in this work (written proof of minimum of five (5) years employment or service with the window manufacturer or similar manufacturer). Individuals are to be either employees of the manufacturer and/or workers approved by the manufacturer.

.2 Provide one (1) thoroughly experienced. reliable, qualified and competent foreman in charge of the work to be on site at all times when work is taking place. Individual to be designated in charge from start of activities on site until final deficiencies are complete. Foreman may only be changed by written approval *or request* of the Consultant or owner.

.3 Window supplier is to have adequate plant and skilled tradesmen and is known to have manufactured and installed similar windows for a minimum of five (5) years in the Province of Ontario.

1.5 SHOP DRAWINGS

.1 Submit shop drawings in accordance with Section 01 33 00 - Submittal Procedures.

.2 Clearly indicate on shop drawings all materials and large scale details for head, jamb and sill as they will be installed in contact with building components for this project, profiles of components, elevations of unit, anchorage details, location of isolation coating, location of insulation to jambs head and sill, drainage locations, description of related components and exposed finishes and fasteners.

.3 Show paths of interior drainage and venting.

1.6 CERTIFICATES

.1 Submit manufacturer's certificate, and test performance data certifying compliance with specification requirements from an Independent Testing Laboratory, for:

.1 windows
.2 finishes.
.3 removable self framed insect screens.
.4 infiltration/exfiltration rates.
.5 thermal transfer resistance of frames.
.6 locking hardware
.7 vandal resistance

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1.7 PERFORMANCE

.1 The overall thermal transmittance of fenestration assemblies shall be less than 0.81 Btu. Thermal transmittance for the fenestration shall be determined using ASHRAE 90.1 calculation procedures and shall include the effect of sash, frame, edge effect and spacer for multiple-glazed units.

.2 Fenestration shall meet CAN/CSA – A440 windows:

.1 Air Leakage: A3

.2 Water Leakage: B7

.3 Wind Load Resistance: C5

.4 Condensation Resistance Factor: fixed frame: 60 minimum

.5 Glass: 59 minimum

.3 Window shall also meet the requirements for blocked operation, ease of operation, sash strength, stiffness and resistance to forced entry.

.4 Submit test reports from a recognized Canadian Independent Testing Laboratory as well as manufacturer's certificate, certifying compliance with the above-noted requirements.

1.8 WASTE MANAGEMENT AND DISPOSAL

.1 Remove from site and dispose of packaging materials at appropriate recycling facilities.

.2 Collect and separate for disposal recyclable packaging materials in appropriate on-site for recycling.

.3 Unused or damaged glazing materials are not recyclable and must not be diverted to municipal recycling programs.

.4 Divert unused or damaged wood materials from landfill to recycling facility approved by Consultant.

.5 Divert unused metal materials from landfill to metal recycling facility approved by Consultant.

.6 Divert unused caulking material from landfill to official hazardous material collections site approved by Consultant.

.7 Plastic caulking tubes are not recyclable and must not be diverted for recycling with other plastic materials.

1.9 WARRANTY

.1 Submit a manufacturer’s written warranty against defects in materials and workmanship covering the components of the window system for a period of five (5) years. The manufacturer shall supply a non-pro-rated warranty covering labour, materials, tools and equipment to repair and/or replace any materials defects at no additional cost, for a period of five (5) years including defects or failures due to poor workmanship and installation.

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.2 The supplier shall also submit a written warrantee, in accordance with Section 088050-Glazing, for ten (10) years warranting the sealed units against defects.

1.10 MAINTENANCE DOCUMENTS AND MATERIALS

.1 Provide 2 copies of data for maintenance and routine cleaning.

.2 Provide 2 copies of final record reviewed shop drawings for owner's records.

.3 Contractor shall supply all accessories as may be required for the operation and performance of the windows system.

1.11 MOCK UP

.1 Construct a window mock up in accordance with Section 01 45 00 – Quality Control. Allow 24 hours for inspection of mock-up by Consultant before proceeding with work. When accepted, mock-up will demonstrate minimum standard for this work. Mock-up may not remain as part of finished work."

Part 2 Products

2.1 MATERIALS

.1 Extrusions shall be AA6063 T54 alloy and temper for framing.

.2 Formed aluminum sheet and plate components shall be AA1100-H14 alloy and temper suitable for their purpose and finish.

.3 Exposed anodized sheet and plate to AA5005-H14 alloy and temper or AA1100-H14 alloy and temper (anodizing quality, 1.6 mm thickness).

.4 Non-exposed sheet and plate to AA3003-H14 alloy and temper, mill finish.

.5 Fasteners shall be 300 series stainless steel or 400 series stainless steel cadmium plated and of sufficient size and quantity to perform their intended function.

.6 Weathering and glazing gaskets shall be extruded, black, closed cell or dense elastomer of durometer appropriate to the function.

.7 Glazing tapes shall be preformed polyisobutylene-butyl glazing tape with integral shim strip, 10-15 durometer, hardness, paper release, black color. Acceptable materials: Tremco Polyshim II by Tremco Ltd.

.8 Exterior Sills: extruded aluminum, minimum 3 mm thick, complete with joint covers, complete with jamb drip deflectors on both sides of each sill (refer also to drawings for type), chairs, anchors, anchoring devices. All corners shall be ground or rounded to eliminate burrs and sharp edges. Sills to be one continuous piece along sill of window. Review installation with the consultant prior to caulking.

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.9 Sealants: shall be in accordance with Section 07900. Colours to Consultant's selection to either match building materials or window frame.

.10 Foam Backer Rod: to be extruded, closed cell foam, round polyethylene rope, minimum 25% wider than width of joint cavity to be caulked. To be compatible with primers and sealants.

.11 Void filler foam: one part expanding polyurethane closed cell foam by BASF, Hilti or approved alternate specifically designed for window applications. To be compatible with primers and sealers

.12 Bedding Compound: to CGSB 19-GP-14M.

.13 Isolation Coating: alkali resistant bituminous paint.

.14 Vandal Screens: if called for on drawings, prefinished metal vandal screens shall be by Armoured Guard Security Screens Inc. Tel. 1 877-372-7336. Colour as selected by Architect.

2.2 FABRICATION

.1 Fabricate in accordance with CSA-A440/A440.1 supplemented as follows:

.2 Fabricate framing from extrusions of size and shape shown on shop drawings. Interior and exterior extruded aluminum framing sections shall be integrated with a glass reinforced nylon thermal break to form a rigid composite assembly without the use of fasteners or other thermal bridging elements.

.3 Composite frame assembly shall have a minimum of 1100 lbf/4 in. (4815N/ 100 mm) resistance to shear between the aluminum and the thermal break materials.

.4 Dry shrinkage of the thermal break shall not exceed 0.1% of the framing member length.

.5 Fixed framing shall be designed for screw spline corner construction. 518 ISOPORT frameless vent operating sash extrusions shall be tubular with mitred, clip, adhesive , stake joint construction.

.6 All framing joints shall be accurately machined, assembled, and sealed to provide neat weather tight connections. Coupling mullions shall be designed to provide a functional split to permit modular construction and allow for thermal expansion. Glass stops shall be aluminum and lock-in screwless type.

.7 All glazing pockets shall be vented, pressure equalized and drained to the exterior.

.8 Elastomeric air seal gasket shall be installed around the full perimeter of glass and sealed at corners wit silicone sealant. Air seal gasket must provide adhesion with silicone sealant.

2.3 ALUMINUM FINISHES

.1 Exposed aluminum sections and infill panels or interior column covers, if any, shown on drawings be given an anodic oxide treatment in accordance with Aluminum Association

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specification AA-M12C22A31. and CAN/CSA-A440 clear anodized Class II, 10μm (.0004 inch.) in accordance with AAMA 611.

.2 For exterior spandrel panels –if required on the project, to be a clear anodized infill panel to match windows finish complete with solid support substrate and insulation layer, clear anodized aluminum smooth or textured finish to Consultant selection.

.3 Allow for three (3) additional colours of infill panels other than anodized. Enamel finish shall be PPG Duranar finish (Kynar 500), 10,000 series or approved alternate.

.4 Final approval of finish and colour to be made by Consultant.

2.4 HARDWARE

.1 Hinging hardware shall be 4 bar concealed hinge 301 Series Heavy Duty Steel 4 bar hinges by Anderberg with positive stop and adjustable friction shoe. Following review window operator location conditions on site, install metal bar restrictors to each hinge at jamb to allow maximum 225 mm opening. only following Consultant direction. Sash projection shall not extend past exterior plane of building wall

.2 For bottom hinged open-in vents, where shown, provide solid cast cam handles and keepers in white satin bronze. Do not cut cam handles to fit sash profiles. Where possible secure cam handles with fastenings concealed from view at underside of frame for top hinged units. Provide a minimum of two (2) solid bronze or stainless steel cam handles per awning unit.

.3 For top hinged/side hinged open out sashes provide roto-operators.

.4 If shown on drawings, provide Teleflex mechanical operators and manual crank operating system for all windows where cams are required to be higher than 1800 above finished floor. Refer to drawings for locations.

2.5 INSECT SCREENS

.1 Fly screens: Provide to all operable units meeting CGSB 79-GP-1M and CSA/CAN-A440 rating heavy duty shall consist of extruded aluminum frame having a wall thickness of 1.9 mm, finish to match windows. Screen cloth shall be 18 x 14 aluminum mesh.

2.6 ISOLATION COATING

.1 Isolate aluminum from following components, by means of isolation coating:

.1 Dissimilar metals except stainless steel, zinc, or white bronze or small area.

.2 Concrete, mortar and masonry.

.3 Wood.

2.7 GLAZING

.1 Prepare windows to receive 25 mm thick double glazed insulating glass specified under Section 088050 – Glazing. Glaze windows in accordance with CSA-A440/A440.1.

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2.8 THRU-WALL FLASHING

.1 Sub-sill flashings to be Blueskin SA by Bakor in locations shown on drawings. Adhere to substrate using primer approved by manufacturer. Ensure clean-up of excess primer and no visible edges of flashing upon completion of the work.

2.9 EXTRUDED SILLS

.1 Sills are to be a minimum of 7 degree (7°) downward slope and integral drip which extends a minimum of 25 mm from the face of the wall cladding.

.2 Install metal sills with uniform wash to exterior, level in length, straight in alignment with plumb upstands and faces. Break form shapes are not permitted.

2.10 ALUMINUM PANNING

.1 Panning to be extruded aluminum minimum 1.6 mm thick with pre-coated finish to be identical process and match to aluminum frames and sills. Break form shapes are not permitted.

.2 Submit samples of panning along with samples of other extrusions and materials.

.3 Metal panning to be designed to lock into new window frames and have true flat planes with no twists, buckles dents, “oil canning” or other similar visual defects caused by manufacturing or handling.

Part 3 Execution

3.1 PREPARATION

.1 Protect adjacent surfaces from damage resulting from work under this specification.

3.2 WINDOW INSTALLATION

.1 Install in accordance with CSA-A440/A440.1.

.2 Arrange components to prevent abrupt variation in colour.

.3 Install the windows in accordance with the manufacturer’s instructions. Install the windows plumb, level and true relative to building structure. Do not exceed 3mm in 3050 mm (1/8” in 10’0”) variation from plumb and level. Foam insulate between the frame members and the window opening using a single component polyurethane foam, insulating sealant.

3.3 SILL INSTALLATION

.1 Install metal sills with uniform wash to exterior, level in length, straight in alignment with plumb upstands and faces. Ensure integral end caps are secured with no burrs or exposed sharp edges and do not require excessive caulking due to profiles at jamb. Break form shapes are not permitted. Include sill end dams of same material. Ensure no sharp edges.

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3.4 CAULKING

.1 Seal joints between frame members and other non-operating components with sealant to provide weathertight seal at outside.

.2 Seal joints between windows and window sills with sealant. Bed sill expansion joint cover plates and drip reflectors in bedding compound. Caulk between sill upstand and window-frame. Caulk butt joints in continuous sills.

.3 Apply sealant in accordance with Section 07 92 10 - Joint Sealing. Conceal sealant within window units except where exposed use is permitted by Consultant.

.4 Interior trims and sealant not to be applied until installed window has been inspected and approved by Consultant.

3.5 CLEAN UP

.1 Clean glass at the factory. For final cleaning of glass to remove job site soiling refer to Section 088050 - Glazing. Leave all surfaces clean, free from sealants, caulking or other foreign material. Remove all surplus materials and debris resulting from the work of this Trade.

.2 Refer to other sections for requirements to make good all finishes.

3.6 PROTECTION

.1 Aluminum shall be isolated from concrete, mortar, plaster or dissimilar metals with bituminous paint or epoxy solution. Framing shall be protected from other building materials during and after installation until acceptance.

END OF SECTION

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Part 1 General

1.1 RELATED SECTIONS

.1 Division 1

.2 Section 06 40 00 – Architectural Woodwork.

.3 Section 08 11 14 – Metal Steel Doors and Frames.

.4 Section 10 22 27 – Folding Partitions.

.5 Section 26: Electrical wiring for magnetic strikes, electric releases and electric locks.

1.2 SECTION INCLUDES

.1 For continuity and ready reference, this section includes hardware Supply, Installation and Inspection.

.2 Hardware Supply: It is the intention of this Section that Installation is by a specialist hardware supplier as prequalified herein for the following scope:

.1 Supply only of door hardware for exterior steel doors.
.2 Supply only of door hardware for interior steel doors.
.3 Supply of locksets for millwork units.
.4 Supervision of door hardware installation (Hardware Consultant).
.5 Supply and installation of automatic operators.

.3 Hardware Installation: It is the intention of this section that Installation is by the Hardware Supplier:

.1 Scope: Installation of door hardware for all interior and exterior steel doors, locks to teachers closets and coordination of installation of automatic operators with Division 26.

.4 Hardware Inspection: It is the intention of this section that Installation is by the Hardware Supplier for all systems and methods described herein.

.1 Scope: inspection of installation of door hardware.

1.3 REFERENCES

.1 CAN/CGSB-69.17-M86 – Bored and Pre-assembled Locks and Latches

.2 CAN/CGSB-69.18-M90/ANSI/BHMA-A156.1-1981 – Butts & Hinges

.3 CAN/CGSB-69.19-M93/ANSI/BHMA-A156-3-1989 – Exit Devices

.4 CAN/CGSB-69.20-M90/ANSI/BHMA-A156-4-1986 – Door Controls (Closers)

.5 CAN/CGSB-69.29-93/ANSI/BHMA-A156-13-1930 – Mortise Locks & Latches

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.6 CAN/CGSB-69.34-93/ANSI/BHMA-A156.18-1987 – Materials & Finishes

.7 Canadian Steel Door & Frame Manufacturers Association (CSDFMA),

.8 Canadian Metric Guide for Steel Doors & Frames (Modular Construction)

.9 NFPA 80-1995 – Fire Doors and Fire Windows

1.4 REQUIREMENTS FOR REQULATORY AGENCIES

.1 Hardware for doors in fire separations and exit doors shall be certified by a Canadian Certification Organization accredited by the Standards Council of Canada.

1.5 SUBMITTALS

.1 Samples:

.1 Submit samples in accordance with Section 01 33 00 - Submittal Procedures.

.1 Butt hinges

.2 Continuous hinges

.3 Door closers

.4 Exit devices

.5 Overhead stops

.6 Storeroom set with lever trim

.2 Identify each sample by a label indicating location for installation, applicable specification paragraph number, brand name and number, finish, and hardware package number.

.3 Samples will be retained by the Consultant during the initial review period, but not exceeding one month. Samples will be returned at that time and, if acceptable, they may be incorporated into the Work.

.4 Substitute new samples for those rejected by the Consultant.

.5 Do not supply door hardware to the site until all samples are approved by the Consultant.

.2 Hardware List:

.1 Submit contract hardware list in accordance with Section 01 33 00 - Submittal Procedures.

.2 Submit six copies of a detailed final door hardware list prepared by a qualified Architectural Hardware Consultant.

.3 List all items to be furnished and delivered under this section.

.4 Indicate door hardware proposed, identifying each item by manufacturer name, manufacturer’s catalogue model number, material, function, finish, location, and other pertinent information.

.5 The list shall be in the same format as the door hardware list bound in this project manual.

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.6 Approval of the Final Door Hardware List by the Consultant and the Owner shall not relieve the Contractor from responsibility for providing all required door hardware.

.3 Template:

.1 Within ten working days of being requested by the Consultant or the Contractor, submit templates for door and frame preparations and mounting of door hardware items.

.2 Identify each template by label indicating applicable specification paragraph number, brand name and number, door number, and hardware package number.

.3 Submit manufacturer's specifications, catalogue cuts, and other data required to identify individual components listed and to demonstrate compliance with specified requirements for items contained in the final door hardware list. Submission of manufacturer's full line brochures is not acceptable.

1.6 DELIVERY, STORAGE, AND HANDLING

.1 Packing, Shipping, Handling and Unloading:

.1 Package each item of hardware including fastenings, separately or in like groups of hardware, label each package as to item definition and location.

.2 Storage and Protection:

.1 Store finishing hardware in locked, clean and dry area.

1.7 WASTE DISPOSAL AND MANAGEMENT

.1 Remove from site and dispose of packaging materials at appropriate recycling facilities.

.2 Dispose of [corrugated cardboard] [polystyrene] [plastic] packaging material in appropriate on-site bin for recycling.

1.8 MAINTENANCE DATA

.1 Provide parts list, manufacturers' instructions, and operation and maintenance data for each type of door hardware for incorporation into maintenance manual specified in Section 017800 – Closeout Submittals.

.2 Brief the Owner's maintenance staff regarding proper care, cleaning, and general maintenance of door hardware.

1.9 MAINTENANCE MATERIALS

.1 Supply four sets of wrenches for door closers, locksets, latchsets, and exit devices.

.2 Supply four sets of other special parts or tools required for proper maintenance and adjustment of door hardware (excluding tools required for keying.)

1.10 WARRANTY

.1 Submit a warranty for door hardware on a form approved by the Owner and in accordance with the General Conditions, but for a period of three (3) years unless specified otherwise. Where a manufacturer's standard warranty period exceeds three years it shall prevail.

.2 The warranty for both fire exit devices and power door operators shall be for a period of five (5) years.

.3 The warranty for door closers shall be for a period of ten (10) years.

.4 Provide a lifetime warranty for all mortise hinges.

.5 Door hardware warranties shall cover all defects in material and workmanship that become apparent during the warranty period and such defects shall be made good or the defective product shall be replaced, to the satisfaction of the Owner and at no cost to the Owner.

Part 2 Products

2.1 HARDWARE ITEMS

.1 Use one manufacturer's products only for similar items.

2.2 DOOR HARDWARE

.1 The hardware supplier shall thoroughly review the door hardware list included with this project manual, the architectural door and hardware schedules, and the drawings prior to preparing the final door hardware list.

.2 The base bid shall be based on the manufacturers and products specified and listed in the attached Door Hardware List.

.3 Use one manufacturer's products only for all similar items.

.4 Ensure that the hardware specified is suitable in both dimension and function for the intended purpose and complies with building code requirements. Advise the Consultant of discrepancies or omissions.

.5 APPROVED HARDWARE SUPPLIERS – Door hardware shall be supplied by one of the following vendors:

.1 Commercial Doors & Hardware, Toronto 416 749-7231
.2 Upper Canada Hardware, East York, 416 696-8358
.3 Empire Hardware, North York, (416) 638-5400
.4 Group 87 Archtiecural Hardware, Burlington (905) 639-4676
.5 Knell's Door & Hardware, Kitchener, 1-800-265-8959
.6 Regional Doors & Hardare Inc., St. Catherines, (905) 684-8161

.6 KEY CONTROL CABINET:

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.1 Enamel finish steel cabinet

.2 Three-way cross reference index card system

.3 Provide all accessories to accommodate all keys

.4 Size cabinet to allow for 25% expansion

.7 KEYING:

.1 All locks shall be 7-Pin removable core by Best Locks.

.2 As part of the cost of this Section, the door hardware Subcontractor shall obtain brass construction cores for all locks from Best Locks.

.3 As part of the cost of this Section, all locks and cylinders are to include Best permanent cores great-grand master keyed to the Owner's requirements.

.8 STRIKES: ANSI with lip, except deadlock strikes which shall be ANSI without lip.

2.3 FASTENINGS

.1 Supply screws, bolts, expansion shields and other fastening devices required for the satisfactory installation and operation of hardware, and as recommended by the hardware manufacturers for long life under hard use.

.2 Exposed screws for installing hardware shall have Phillips or Robertson heads.

.3 Exposed fastening devices shall match the finish and material of hardware.

.4 Where a pull is scheduled on one side of a door and a push plate on the other side, supply fastening devices, and install so the pull can be secured through the door from the reverse side. Install the push plate to cover fasteners.

.5 Use fasteners compatible with material through which they pass.

.6 All door closers shall be through-bolt mounted.

Part 3 Execution

3.1 MANUFACTURER'S INSTRUCTIONS

.1 Furnish door and frame manufacturers with complete instructions and templates for preparation of their work to receive hardware. Advise door and frame manufacturers to be aware that strike heights as listed in the table below are required for this project.

.2 Furnish manufacturers' instructions for proper installation of each hardware component.

3.2 INSTALLATION

.1 ALL DOORS, FRAMES, AND FINISHING HARDWARE SHALL BE INSTALLED BASED ON DHI INSTALLATION GUIDE FOR DOORS AND HARDWARE (ANSI/DHI A115.1G-1994 – Approved 8/19/94)

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.2 Door hardware shall be installed by an approved Hardware Installer selected by the Hardware Supplier.

.3 Power door operators, complete with hook-up to power rough-in, low voltage control wiring, and exit device release, shall be installed by the manufacturers' recommended installer.

.4 Power door operators and **emergency assist devices** to be installed by hardware supplier. Low voltage control wiring to push button locations, exit device release, and 4" x 4" back boxes to be completed by Division 26 (Electrical Contractor.). **The low voltage wiring to be supplied by the Hardware Supplier to the Electrical Contractor for installation**.

.5 ARCHITECTURAL HARDWARE CONSULTANT:

.1 The hardware supplier shall have in its employ an Architectural Hardware Consultant who is a current member of the American Society of Hardware Consultants, and who shall be made available for consultation during the course of construction at no additional cost to the Owner.

.2 The Architectural Hardware Consultant must supervise hardware installation, provide assistance to the Hardware Installer, and carry out inspection and provide written certification of the finished door hardware installation.

.3 Allow for a minimum of three inspections during the course of hardware installation and one final inspection.

.4 Ten percent (10%) of this subtrade's contact will be considered as fair value for supervision and inspection with regard to progress certificates.

.5 Locate and mount hardware at standard location dimensions in accordance with CSDFMA, Canadian Metric Guide for Steel Doors and Frames (Modular Construction), and as indicated in the following table:

HARDWARE MOUNTING HEIGHTS	
HARDWARE ITEM	**DIMENSION ABOVE FINISHED FLOOR**
LOCKSET or LATCHSET	950 mm to Centreline of Strike
DEADLOCK	1200 mm to Centreline of Strike
EXIT DEVICE	950 mm to Centreline of Strike
PUSH PLATE/DOOR PULLS	900 mm to Centreline of Strike

.6 HARDWARE MOUNTING HEIGHTS

.1 The Hardware Installer shall carefully check manufacturer's installation instructions supplied with hardware products for conflicts with the above noted dimensions.

.2 The Hardware Installer shall use manual or "Yankee" screw drivers to turn screws into pre-drilled pilot holes for installation of hinges on mineral core fire protection rated doors. Please note that other methods of installation may void the door manufacturer's warranty.

.3 The recommended mounting heights shall be considered a general guide unless conditions such as intermediate rails and lines of glass dictate otherwise.

.4 Locate door stops to contact doors 75mm from latch edge.

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.5 Install hardware and trim square and plumb to doors.

.6 Install mullion stabilizers at centre mullions at double doors and intermediate mullions on multiple door arrangements.

.7 Supply locksets to Section 064000 – Architectural Woodwork for 35mm and 45mm thick doors where such doors are a part of millwork units. Keying shall be in accordance with the building keying system for

3.3 ADJUSTING

.1 Adjust door hardware, operators, closures and controls for optimum, smooth operating condition, safety and for weather tight closure.

.2 Ensure doors with closers close firmly and against wind and building air pressure, and can be opened readily as suitable for installation.

.3 Inspection:

.1 The Hardware Supplier shall have in his employ an Architectural Hardware Consultant who is a current member of the American Society of Hardware Consultants, and who shall be made available for consultation during the course of construction at no additional cost to the Board.

.2 In addition to this available consultant, a Hardware Inspector shall be engaged upon recommendation to the Board by the Consultants and costs for inspection paid for from Cash Allowances.

.3 The Consultant shall advise the Contractor that Hardware Inspector shall be assigned to supervise the hardware installation, provide assistance to the Hardware Installer, and carry out inspection and provide written certification of the finished door hardware installation. Costs for this inspection shall be paid from the Cash Allowance. The Contractor shall notify the Hardware Inspector at least 72 hours prior to commencing the installation and cooperate with the advice of the inspector.

.4 Upon completion of door hardware installation, the Architectural Hardware Inspector shall conduct an inspection of all door hardware as installed, accompanied by the Consultant, the Owner's representative, and the Contractor.

.5 If requested by the Consultant, the manufacturer's technical representative for each make of the hardware used in the Work shall be in attendance during the hardware inspection.

.6 During the inspection, the Architectural Hardware Inspector shall note all unsatisfactory installations and products and re-inspect these items after re-adjustment or replacement to ensure all hardware is in optimum working condition and specified function.

.4 Upon completion of door hardware installation, the Hardware Supplier shall submit a written certificate that all hardware has been correctly supplied and installed in accordance with the drawings, specifications, schedules, and approved final door hardware list, for type, function, and location, and that door hardware has been checked and adjusted.

.5 Clean hardware after installation following the hardware supplier's recommendations.

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.6 At project completion all items of door hardware shall be clean and free from disfigurement. The Contractor shall repair or replace hardware found to be defective.

3.4 CLEANING

.1 Perform cleaning after installation to remove construction and accumulated environmental dirt.

.2 Clean hardware with damp rag and approved non-abrasive cleaner, and polish hardware in accordance with manufacture's instructions.

.3 Remove protective material from hardware items where present.

.4 Upon completion of installation, remove surplus materials, rubbish, tools and equipment barriers.

END OF SECTION

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PART 1 - GENERAL

1.1 This hardware schedule has been prepared by:

Commercial Doors & Hardware Ltd.
2150 Winston Park Dr., Oakville, ON

Ross Ruprecht
Architectural Sales Consultant

P: 416-749-7231 Ext: 227
C: 416-716-6678
Email:ross@cdh.ca

PART 2 - FINISHING HARDWARE SCHEDULE

2.1 Refer to the Finishing Hardware List on the following pages.

2.2 Door hardware shall be supplied and installed by the hardware supplier.

2.3 The warranty will be carried by the hardware supplier.

Finishing Hardware Schedule

NORTH OAKVILLE #3 HCDSB

Architect
HOSSACK & ASSOCIATES ARCHITECTS

Detailer: **Austin Baril**
Consultant: **Ross Ruprecht B.A., A.H.C.**

Manufacturers & Finishes

Manufacturers

Camden
Canadian Builders Hdw
CBH
Glynn-Johnson
GYROTECH
Ives
K.N. Crowder
LCN
MISC
Schlage
Schlage E.S.
Telkee
UNK
Von Duprin
Yale
Zero

Finishes

626 - Satin chromium plated over nickel
627 - Satin aluminum, clear coated
628 - Satin aluminum, clear anodized
630 - Satin stainless steel
652 - Satin chromium plated over nickel
689 - Aluminum painted
US26D - Satin chromium plated over nickel
US28 - Satin aluminum, clear anodized
US32D - Satin stainless steel

Openings Schedule

Opening Number(s)	Qty	Door Catalog	Location 1	To/ From	Location 2	Nominal Width	Nominal Height	Door Thickness	Hand	Label	Degree of Opening	Hardware Group	Remarks	Heading Num.
101A	1	<Aluminum>	EXTERIOR	From	VESTIBULE 101	1000, 1000	2150	57	LHRA/RHRA	-	100°	27	B/F DOOR OPERATOR, REMOVEABLE MULLION, ELECTRIC SECURITY STRIKE TO OFFICE. COORDINATE DOOR WITH CURTAIN WALL MANUFACTURER. COORD WITH ELEC FOR VIDEO INTERCOM SYSTEM / CARD READER.	1
101B	1	<Aluminum>	VESTIBULE 101	From	STUDENT FORUM 102	1000, 1000	2150	45	LHRA/RHRA	-	100°	32-T	B/F DOOR OPERATOR. REMOVEABLE MULLION	2
103A	1	<Aluminum>	FORUM	FROM	LEARNING COMMONS	1000, 1000	2150	45	LHA/RHA	-	100°	08	B/F DOOR OPERATOR TO BE INSTALLED ON LEARNING COMMONS SIDE, REMOVEABLE MULLION, COORDINATE DOOR WITH CURTAIN WALL MANUFACTURER. rem mullion	3
103B	1	<Aluminum>	EXTERIOR	From	LEARNING COMMONS 103	1000, 1000	2150	57	LHRA/RHRA	-	100°	33-T	COORDINATE DOOR WITH CURTAIN WALL MANUFACTURER.	4
104A	1	<Hollow Metal>	LEARNING COMMONS 103	To	WORKROOM 104	950	2150	44	LH	-	90°	12		5
105A	1	<Hollow Metal>	LEARNING COMMONS 103	From	CART ROOM 105	950	2150	44	LHR	-	90°	STORAGE NO CL OHS		6
106A	1	<Wood>	STUDENT FORUM 102	To	GENERAL OFFICE 106	950	2150	44	LH	-	90°	CLASS RM ADO	B/F DOOR OPERATOR. COORDINATE DOOR WITH CURTAIN WALL MANUFACTURER.	7
106B	1	<Hollow Metal>	RECEIVING/CUSTOD	To	GENERAL OFFICE 106	950	2150	44	LH	45MIN	90°	CLASS RM CL WS		8
107A	1	<Wood>	STUDENT FORUM 102	To	WORKROOM 107	950	2150	44	LH	-	90°	CLASS RM INT CL SOHS		9
107B	1	<Wood>	GENERAL OFFICE 106	To	WORKROOM 107	950	2150	44	RH	-	90°	12		10
108A	1	<Wood>	GENERAL OFFICE 106	To	OFFICE 108	950	2150	44	LH	-	90°	05		11
109A	1	<Wood>	GENERAL OFFICE 106	To	OFFICE 109	950	2150	44	RH	-	90°	05		11
110A	1	<Wood>	GENERAL OFFICE 106	To	OFFICE 110	950	2150	44	RH	-	90°	05		11
111A	1	<Wood>	GENERAL OFFICE 106	To	OSR 111	950	2150	44	LH	-	90°	12		10
112A	1	<Wood>	GENERAL OFFICE 106	To	HEALTH 112	950	2150	44	LH	-	90°	02		12
113A	1	<Wood>	HEALTH 112	To	WASHROOM 113	950	2150	44	LH	-	90°	19		13
114A	1	<Wood>	GENERAL OFFICE 106	To	STORAGE 114	950	2150	44	RH	-	90°	06		14
115A	1	<Wood>	STUDENT FORUM 102	To	SEMINAR 115	950	2150	44	LH	-	90°	12		10
116A	1	<Hollow Metal>	STUDENT FORUM 102	To	OFFICE 116	950	2150	44	RH	-	90°	05		15
117A	1	<Hollow Metal>	STUDENT FORUM 102	To	RECEIVING/CUSTODIAN 117	950	2150	44	LH	45MIN	90°	CLASS RM CL WS		8
117B	1	<Hollow Metal>	EXTERIOR	From	RECEIVING/CUSTODIA 117	1000, 1000	2150	44		-		EXT STORAGE	INSULATED DOOR & FRAME.	16
118A	1	<Hollow Metal>	RECEIVING/CUSTOD	To	ELECTRICAL 118	950	2150	44	LH	45MIN	90°	45		17
120A	1	<Wood>	CORRIDOR	To	SEMINAR	950	2150	44	RH	-	90°	45		18
121A	1	<Hollow Metal>	STAGE 122	To	NUTRITION 121	950	2150	44	LH	20MIN	100°	CLASS RM CL WS		19
122A	1	<Hollow Metal>	LEARNING COMMONS 103	To	STAGE 122	950	2150	44	LH	20MIN	90°	30	COORDINATE DOOR WITH CURTAIN WALL MANUFACTURER.	20

Opening Number(s)	Qty	Door Catalog	Location 1	To/ From	Location 2	Nominal Width	Nominal Height	Door Thickness	Hand	Label	Degree of Opening	Hardware Group	Remarks	Heading Num.
122B	1	<Hollow Metal>	STUDENT FORUM 102	From	STAGE 122	950	2150	44	LHR	20MIN	180°	STAGE EMHO	ELECTROMAGNETIC HOLDER 150mm A.F.F, 180 DEGREE SWING. COORDINATE DOOR WITH CURTAIN WALL MANUFACTURER.	21
122C	1	<Hollow Metal>	STUDENT FORUM 102	From	STAGE 122	950	2150	44	RHR	20MIN	180°	STAGE EMHO	ELECTROMAGNETIC HOLDER 150mm A.F.F, 180 DEGREE SWING. COORDINATE DOOR WITH CURTAIN WALL MANUFACTURER.	21
124A	1	<Hollow Metal>	GYMNASIUM 125	From	CORRIDOR 124	950	2150	44	RHR	-	90°	31		22
125A	1	<Hollow Metal>	CORRIDOR 129	From	GYMNASIUM 125	1000, 1000	2150	44	LHRA/RHRA	20MIN	90°,180°	54	B/F OPERATOR, REMOVEABLE MULLION, 180 DEGREE SWING ONE LEAF. COORDINATE DOOR WITH CURTAIN WALL MANUFACTURER.	23
125B	1	<Aluminum>	EXTERIOR	From	GYMNASIUM 125	1000, 1000	2150	57	LHRA/RHRA	-	100°	21	COORDINATE DOOR WITH CURTAIN WALL MANUFACTURER.	24
125C	1	<Hollow Metal>	EXTERIOR	From	GYMNASIUM 125	1000, 1000	2150	44	LHRA	-	100°	EXT GYM PR HM	INSULATED DOOR & FRAME.	25
125D	1	<Hollow Metal>	CORRIDOR 129	From	GYMNASIUM 125	1000, 1000	2150	44	LHRA	20MIN	90°	GYM PR ULC		26
126A	1	<Hollow Metal>	GYMNASIUM 125	To	CHANGE ROOM 126	950	2150	44	LH	-	90°	23		27
127A	1	<Hollow Metal>	GYMNASIUM 125	To	CHANGE ROOM 127	950	2150	44	RH	-	90°	23		27
128AA	1	<Hollow Metal>	GYMNASIUM 125	To	GYM STORAGE A 128	1100	2150	44	RH	-	90°	22		28
128BA	1	<Hollow Metal>	GYMNASIUM 125	To	GYM STORAGE B 128	1100	2150	44	RH	-	90°	22		28
130A	1	<Wood>	CORRIDOR 129	To	CLASSROOM 1 130	950	2150	44	RH	-	90°	12		10
131A	1	<Wood>	CORRIDOR 129	To	CLASSROOM 2 131	950	2150	44	LH	-	90°	12		10
132A	1	<Aluminum>	EXTERIOR	From	STAIR A 132	1000, 1000	2150	57	LHRA/RHRA	-	100°	EXT STAIR ALUM ADO	B/F DOOR OPERATOR. COORDINATE DOOR WITH CURTAIN WALL MANUFACTURER.	29
132B	1	<Hollow Metal>	STAIR A 132	From	CORRIDOR 129	1000, 1000	2150	44	LHRA	45MIN	90°,180°	VEST PR ULC ADO	B/F DOOR OPERATOR. 180 DEGREE SWING ONE LEAF	30
133A	1	<Hollow Metal>	CORRIDOR 129	To	STAFF ROOM 133	950	2150	44	RH	-	90°	61		31
134A	1	<Wood>	SPEC. ED 137	To	SENSORY 134	950	2150	44	RH	-	90°	02		12
135A	1	<Wood>	CORRIDOR 129	To	SAFE ROOM 135	950	2150	44	LH	-	90°	02		12
136A	1	<Wood>	CORRIDOR 129	To	THERAPY 136	950	2150	44	RH	-	90°	02		12
136B	1	<Wood>	SPEC. ED 137	To	THERAPY 136	950	2150	44	LH	-	90°	02		12
137A	1	<Wood>	CORRIDOR 129	To	SPEC. ED 137	950	2150	44	RH	-	90°	12		10
141A	1	<Hollow Metal>	CORRIDOR 140	To	LAN 141	950	2150	44	RH	-	90°	10		32
142A	1	<Hollow Metal>	CORRIDOR 140	To	UNIVERSALE WR 142	950	2150	44	RH	-	90°	WR ADO OHS	B/F DOOR OPERATOR TO BE INSTALLED ON WR SIDE	33
143A	1	<Hollow Metal>	CORRIDOR 140	To	WASHROOM 143	950	2150	44	LH	-	90°	19		34
144A	1	<Hollow Metal>	CORRIDOR 140	To	WASHROOM 144	950	2150	44	LH	-	90°	19		34
145A	1	<Wood>	CORRIDOR 140	To	WORKROOM 145	950	2150	44	LH	-	90°	12		10
146A	1	<Wood>	CORRIDOR 140	To	KINDERGARTEN 146	950	2150	44	RH	-	90°	12		10
147A	1	<Wood>	CORRIDOR 140	To	KINDERGARTEN 147	950	2150	44	LH	-	90°	12		10
148A	1	<Wood>	CORRIDOR 140	To	KINDERGARTEN 148	950	2150	44	RH	-	90°	12		10
149A	1	<Wood>	CORRIDOR 140	To	KINDERGARTEN 149	950	2150	44	LH	-	90°	12		10

Opening Number(s)	Qty	Door Catalog	Location 1	To/ From	Location 2	Nominal Width	Nominal Height	Door Thickness	Hand	Label	Degree of Opening	Hardware Group	Remarks	Heading Num.
150A	1	<Aluminum>	EXTERIOR	From	STAIR B 150	1000, 1000	2150	57	LHRA/RHRA	-	100°	EXT STAIR ALUM ADO	B/F DOOR OPERATOR, COORDINATE DOOR WITH CURTAIN WALL MANUFACTURER.	29
150B	1	<Hollow Metal>	STAIR B 150	From	CORRIDOR 140	1000, 1000	2150	44	LHRA	45MIN	90°,180°	VEST PR ULC ADO	B/F DOOR OPERATOR, 180 DEGREE SWING ONE LEAF	30
150C	1	<Aluminum>	EXTERIOR	From	STAIR B 150	1000, 1000	2150	57	LHRA	-	90°,180°	EXT STAIR ALUM ADO	B/F DOOR OPERATOR, COORDINATE DOOR WITH CURTAIN WALL MANUFACTURER.	29
151A	1	<Wood>	CORRIDOR 140	To	KINDERGARTEN 151	950	2150	44	RH	-	90°	12		10
152A	1	<Hollow Metal>	EXTERIOR	From	CORRIDOR 152	1000, 1000	2150	44	LHRA	-	100°	58	B/F DOOR OPERATOR, INSULATED DOOR & FRAME, FM	35
153A	1	<Wood>	CORRIDOR 140	To	KINDERGARTEN 153	950	2150	44	LH	-	90°	12		10
154A	1	<Hollow Metal>	CORRIDOR 140	To	STORAGE 154	950	2150	44	LH	-	90°	03	REFER TO INTERIOR ELEVATION OF CORRIDOR 140 FOR PATTERN OF PAINTING ON CORRIDOR SIDE.	36
154B	1	<Hollow Metal>	OUTDOOR STORAGE 155	To	STORAGE 154	950	2150	44	LHR	1.5HR	90°	03		37
155A	1	<Hollow Metal>	EXTERIOR	From	OUTDOOR STORAGE 155	1100	2150	44	LHR	-	100°	11	INSULATED DOOR & FRAME	38
157A	1	<Hollow Metal>	CORRIDOR 129	From	ELEVATOR MACH. RM 147	950	2150	44	RHR	45MIN	100°	STORAGE CUSH SS		39
301A	1	<Aluminum>	EXTERIOR	From	VESTIBULE 301	1000, 1000	2150	57	LHRA/RHRA	-	100°	27-301	B/F DOOR OPERATOR, REMOVABLE MULLION, ELECTRIC SECURITY STRIKE TO OFFICE. COORDINATE DOOR WITH CURTAIN WALL MANUFACTURER. COORD WITH ELEC FOR VIDEO INTERCOM SYSTEM / CARD READER, B/F OPERATOR IN CURTAIN WALL FRAMING. COORD. WITH ELEC. TO RUN CONDUIT IN FRAME SYSTEM	40
301B	1	<Hollow Metal>	VESTIBULE 301	From	CORRIDOR 302	1000, 1000	2150	44	LHRA/RHRA	-	100°	VEST PR ADO FG	B/F OPERATOR	41
302A	1	<Hollow Metal>	FORUM	FROM	CC CORR	950	2150	44	RHR	-	90°	31		22
303A	1	<Wood>	CORRIDOR 302	From	INFANT 303	950	2150	44	LHR	-	180°	12 with FG	180 DEGREE SWING	42
304A	1	<Aluminum>	EXTERIOR	From	VESTIBULE 304	950	2150	57	LHR	-	100°	EXT SGL NL ADO FG	B/F DOOR OPERATOR, COORDINATE DOOR WITH CURTAIN WALL MANUFACTURER.	43
304B	1	<Hollow Metal>	VESTIBULE 304	From	INFANT 303	950	2150	44	RHR	-	90°	VEST SGL ADO FG	B/F DOOR OPERATOR	44
305A	1	<Wood>	INFANT 303	To	SLEEPING AREA 305	950	2150	44	LH	-	90°	50		45
306A	1	<Wood>	INFANT 303	To	WASHROOM 306	950	2150	44	LH	-	90°	49		46
307A	1	<Wood>	CORRIDOR 302	To	STORAGE 307	950	2150	44	LH	-	90°	06		14
308A	1	<Wood>	CORRIDOR 302	To	OFFICE 308	950	2150	44	RH	-	90°	05		11
309A	1	<Hollow Metal>	CORRIDOR 302	To	CUST./MECH. 309	950	2150	44	RH	-	90°	09		47
310A	1	<Hollow Metal>	CORRIDOR 302	To	LAUNDRY 310	950	2150	44	RH	-	90°	16		48
311A	1	<Wood>	CORRIDOR 302	To	BARRIER-FREE WR 311	950	2150	44	LH	-	90°	20	B/F OPERATOR	49
312A	1	<Hollow Metal>	CORRIDOR 302	To	KITCHEN 312	950	2150	44	RH	-	90°	14		50
312B	1	<Hollow Metal>	CORRIDOR 302	To	KITCHEN 312	950	2150	44	LH	-	90°	14		50
313A	1	<Wood>	CORRIDOR 302	To	STAFF ROOM 313	950	2150	44	RH	-	90°	61		51
314A	1	<Wood>	CORRIDOR 302	To	PRE-SCHOOL 314	950	2150	44	LH	-	90°	12 with FG		42
314B	1	<Hollow Metal>	VESTIBULE 316	From	PRE-SCHOOL 314	950	2150	44	RHR	-	90°	VEST SGL ADO FG	B/F OPERATOR	44
315A	1	<Wood>	PRE-SCHOOL 314	To	WASHROOM 315	950	1200	44	RH	-	90°	49 with FG	HALF DOOR, COORD. WITH WOOD JAMB. REF. AD DETAILS	52

Opening Number(s)	Qty	Door Catalog	Location 1	To/ From	Location 2	Nominal Width	Nominal Height	Door Thickness	Hand	Label	Degree of Opening	Hardware Group	Remarks	Heading Num.
316A	1	<Aluminum>	EXTERIOR	From	VESTIBULE 316	950	2150	57	LHR	-	100°	EXT SGL NL ADO FG	B/F OPERATOR, COORDINATE DOOR WITH CURTAIN WALL MANUFACTURER.	43
317A	1	<Wood>	CORRIDOR 302	To	PRE-SCHOOL 317	950	2150	44	RH	-	90°	12 with FG		42
317B	1	<Hollow Metal>	VESTIBULE 316	From	PRE-SCHOOL 317	950	2150	44	LHR	-	90°	VEST SGL ADO FG	B/F OPERATOR	44
318A	1	<Wood>	PRE-SCHOOL 317	To	WASHROOM 318	950	1200	44	RH	-	90°	49 with FG	HALF DOOR, COORD. WITH WOOD JAMB. REF. AD DETAILS	52
319A	1	<Wood>	CORRIDOR 302	To	TODDLER 319	950	2150	44	LH	-	90°	12 with FG		42
319B	1	<Hollow Metal>	VESTIBULE 321	From	TODDLER 319	950	2150	44	RHR	-	90°	VEST SGL ADO FG	B/F OPERATOR	44
320A	1	<Wood>	TODDLER 319	To	WASHROOM 320	950	1200	44	RH	-	90°	49 with FG	HALF DOOR, COORD. WITH WOOD JAMB. REF. AD DETAILS	52
321A	1	<Aluminum>	EXTERIOR	From	VESTIBULE 321	950	2150	57	LHR	-	100°	EXT SGL NL ADO FG	B/F OPERATOR, COORDINATE DOOR WITH CURTAIN WALL MANUFACTURER.	43
322A	1	<Wood>	TODDLER 319	To	STORAGE 322	950	2150	44	LH	-	90°	6 with FG		53
322B	1	<Wood>	TODDLER 319	To	STORAGE 322	950	2150	44	RH	-	90°	6 with FG		53
323A	1	<Wood>	CORRIDOR 302	To	TODDLER 323	950	2150	44	RH	-	90°	12 with FG		42
323B	1	<Hollow Metal>	VESTIBULE 321	From	TODDLER 323	950	2150	44	LHR	-	90°	VEST SGL ADO FG	B/F OPERATOR	44
324A	1	<Wood>	TODDLER 323	To	WASHROOM 324	950	1200	44	LH	-	90°	49 with FG	HALF DOOR, COORD. WIDTH WITH WOOD JAMB. REF. AD DETAILS	52
325A	1	<Hollow Metal>	EXTERIOR	From	CHILDCARE STORAGE 325	1000	2150	44	LHR	-	100°	EXT STORAGE 1000	INSULATED DOOR & FRAME	54
201A	1	<Hollow Metal>	STAIR C 201	From	CORRIDOR 219	1000, 1000	2150	44	LHRA	45MIN	100°	42	ELECTROMAGNETIC HOLD OPENS COORD. WITH ELECTRICAL, REMOVEABLE MULLION	57
204A	1	<Wood>	CORRIDOR 203	To	SEMINAR 3 204	950	2150	44	LH	-	90°	12		10
206A	1	<Hollow Metal>	CORRIDOR 203	To	MECHANICAL ROOM 206	950	2150	44	LH	45MIN	100°	41		58
206B	1	<Hollow Metal>	CORRIDOR 203	To	MECHANICAL ROOM 206	950	2150	44	RH	45MIN	90°	41		58
207A	1	<Wood>	CORRIDOR 203	To	CLASSROOM 3 207	950	2150	44	RH	-	90°	12		10
208A	1	<Wood>	CORRIDOR 203	To	CLASSROOM 4 208	950	2150	44	LH	-	90°	12		10
209A	1	<Hollow Metal>	STAIR A 209	From	CORRIDOR 203	1000, 1000	2150	44	LHRA	45MIN	180°,100°	VEST PR ULC EMHO	180 DEGREE SWING 1 LEAF, ELECTROMAGNETIC HOLD OPENS	59
210A	1	<Wood>	CORRIDOR 203	To	CLASSROOM 5 210	950	2150	44	LH	-	90°	12		10
211A	1	<Wood>	CORRIDOR 203	To	CLASSROOM 6 211	950	2150	44	RH	-	90°	12		10
212A	1	<Wood>	CORRIDOR 203	To	CLASSROOM 7 212	950	2150	44	LH	-	90°	12		10
215A	1	<Hollow Metal>	CORRIDOR 219	To	IT 215	950	2150	44	RH	-	90°	STORAGE CL WS		60
216A	1	<Hollow Metal>	CORRIDOR 219	To	CUST. 216	950	2150	44	LH	-	90°	09		47
217A	1	<Hollow Metal>	CORRIDOR 219	To	BARRIER-FREE WR 217	950	2150	44	RH	-	90°	WR CORR		61
218A	1	<Hollow Metal>	CORRIDOR 219	To	WASHROOM 218	950	2150	44	LH	-	90°	WR CORR		61
220A	1	<Wood>	CORRIDOR 219	To	CLASSROOM 8 220	950	2150	44	RH	-	90°	12		10
221A	1	<Wood>	CORRIDOR 219	To	CLASSROOM 9 221	950	2150	44	LH	-	90°	12		10

Opening Number(s)	Qty	Door Catalog	Location 1	To/ From	Location 2	Nominal Width	Nominal Height	Door Thickness	Hand	Label	Degree of Opening	Hardware Group	Remarks	Heading Num.
221B	1	<Wood>	CLASSROOM 9 221	FROM	SEMINAR 5 222	950	2150	44	LHR	-	90°	CLASS RM OHS		62
222A	1	<Wood>	CORRIDOR 219	FROM	SEMINAR 5 222	950	2150	44	RH	-	90°	12		10
223A	1	<Wood>	CORRIDOR 219	To	CLASSROOM 10 223	950	2150	44	RH	-	90°	12		10
223B	1	<Wood>	CLASSROOM 10 223	FROM	SEMINAR 5 222	950	2150	44	RHR	-	90°	CLASS RM OHS		62
224A	1	<Wood>	CORRIDOR 219	To	CLASSROOM 11 224	950	2150	44	LH	-	90°	12		10
225A	1	<Wood>	CORRIDOR 219	To	CLASSROOM 12 225	950	2150	44	RH	-	90°	12		10
226A	1	<Wood>	CORRIDOR 219	To	CLASSROOM 13 226	950	2150	44	LH	-	90°	12		10
227A	1	<Hollow Metal>	STAIR B 227	From	CORRIDOR 219	1000, 1000	2150	44	LHRA	45MIN	180°,100°	VEST PR ULC EMHO	180 DEGREE SWING, ELECTROMAGNETIC HOLD OPENS	59
228A	1	<Wood>	CORRIDOR 219	To	ACAD STORAGE 228	950	2150	44	LH	-	90°	03		63
229A	1	<Wood>	CORRIDOR 219	To	WORKROOM 229	950	2150	44	RH	-	90°	12		10
230A	1	<Wood>	CORRIDOR 219	To	CLASSROOM 14 230	950	2150	44	RH	-	90°	12		10
231A	1	<Wood>	CORRIDOR 219	To	CLASSROOM 15 231	950	2150	44	LH	-	90°	12		10
232A	1	<Wood>	CORRIDOR 219	To	CLASSROOM 16 232	950	2150	44	RH	-	90°	12		10
233A	1	<Wood>	CORRIDOR 219	To	CLASSROOM 17 233	950	2150	44	LH	-	90°	12		10
233B	1	<Wood>	CLASSROOM 17 233	FROM	SEMINAR 6 234	950	2150	44	LHR	-	90°	CLASS RM OHS		62
234A	1	<Wood>	CORRIDOR 219	To	SEMINAR 6 234	950	2150	44	LH	-	90°	12		10
235A	1	<Wood>	CORRIDOR 219	To	CLASSROOM 18 235	950	2150	44	RH	-	90°	12		10
235B	1	<Wood>	CLASSROOM 18 235	FROM	SEMINAR 6 234	950	2150	44	RHR	-	90°	CLASS RM OHS		62
236A	1	<Wood>	CORRIDOR 219	To	CLASSROOM 19 236	950	2150	44	LH	-	90°	12		10
237A	1	<Wood>	CORRIDOR 219	To	CLASSROOM 20 237	950	2150	44	RH	-	90°	12		10
238A	1	<Wood>	CORRIDOR 219	To	SCIENCE 238	950	2150	44	RH	-	90°	12		10
239A	1	<Wood>	CORRIDOR 219	To	ART 239	950	2150	44	LH	-	90°	12		10
240A	1	<Hollow Metal>	ART 239	To	STORAGE 240	950	2150	44	LH	-	90°	06		64
241A	1	<Hollow Metal>	MUSIC 242	To	STORAGE 241	950	2150	44	LH	-	90°	06		64
242A	1	<Wood>	CORRIDOR 219	To	MUSIC 242	950	2150	44	LH	-	90°	CLASS WS SS		65
243A	1	<Hollow Metal>	MECH. MEZZANINE 243	0	0	950	2150	44	RHR	-	100°	ROOF	INSULATED DOOR & FRAME	66
244A	1	<Hollow Metal>	CORRIDOR 203	From	STORAGE 244	950	2150	44	RHR	-	90°	STORAGE CUSH		67
TC-CLOSET	1	<None>										62-TC CLOSETS		68
MISC	1	<None>										63-MISC		69

GENERAL COMMENTS.

-TYPICAL FOR ALL AUTO DOOR OPERATORS.

HARDWARE SUPPLIER DIV 08710 TO SUPPLY AND INSTALL OPERATORS.
AUTO OPERATORS MUST BE SUPPLIED AS SPECIFIED. NO ALTERNATES WILL BE ACCEPTED.
HARDWARE SUPPLIER TO PROVIDE WIRING DIAGRAMS .
ELECTRICAL CONTRCTOR TO PROVIDE 120VAC TO HEAD OF FRAME & TO ANY POWER SUPPLIES LISTED.
ELECTRICAL CONTRACTOR TO S & I ALL LVW IN CONDUIT TO ALL ACTUATORS , ES , CR AND ALL ELECTRICAL COMPONETS LISTED . REFER TO WIRING DIAGRAM.

Hardware Schedule

Heading #1 (Group: 27)

Item #1 — 1 Pair of doors 101A, EXTERIOR From VESTIBULE 101 — 100° LHRA/RHRA

1000, 1000 x 2150 x 57 - AL DR x AL FR - -

2	Continuous Hinge	Ives 112XY-83" US28	US28
1	Removable Mullion	Von Duprin KR4854-2150"-{BLANK}-689	689
1	Exit Device	Von Duprin 35A-EO-626- x 2150 Door 57-	626
1	Exit Device	Von Duprin 35A-NL-OP US26D	626/626
		ACT LAEF	
1	Cylinder	Schlage MORT 20-001 CMK GMK	626
1	Cylinder	Schlage PRIMUS CORE 20-740 FP KWY FILE #1212	626
1	Cylinder	Schlage RIM 20-057-ICX	626
1	Electric Strike	Von Duprin 6300- Shim 24VDC-630	630
		ACT LAEF	
2	Door Pull	CBH CBH 7008-1 No. 1 C32D	US32D
1	Surface Closer	LCN 4021 REGARM 689 57	689
1	Mounting Bracket	LCN 4020-18G	689
1	Electronic Closer	GYROTECH ADO GT8710 X FWH 628 NO ALTERNATE	
1	Overhead Door Stop	Glynn-Johnson 104S ADJ	630
		ADO LEAF	
1	Overhead Door Stop	Glynn-Johnson 104S US32D	US32D
1	Threshold	K.N. Crowder CT-46 X 84" AL	627
2	Weatherstripping	K.N. Crowder W-24S x 42"	628
2	Miscellaneous Item	Schlage E.S. 679-05HM BY SCURITY CONTRACTOR	BLK
1	Miscellaneous Item	LCN 8310-802	PLA
1	Miscellaneous Hardware	UNK CARD READER/INTERCOM BY OTHERS	
1	Miscellaneous Hardware	Camden CM-160/21 INSTALL IN ADO HEADER	
2	Miscellaneous Hardware	Camden CM-60/4	
2	Miscellaneous Hardware	Camden CM-89S	
1	Miscellaneous Hardware	Camden CX-33	
1	Miscellaneous Hardware	MISC WEATHERSTRIP BY ALUM DR/FR SUPPLIER	

WEATHERSEAL BY DOOR MANUFACTURER

HARDWARE SUPPLIER SECTION 08710 TO SUPPLY & INSTALL AUTO OPERATOR.
ELECTRICAL CONTRACTOR TO PROVIDE 120VAC TO HEAD OF FRAME.
ELECTRICAL CONTRACTOR TO SUPPLY & INSTALL ALL LVW IN CONDUIT TO ALL ELECTRICAL COMPONENTS LISTED IN HARDWARE LIST. REFER TO WIRING DIAGRAM SUPPLIED BY HARDWARE SUPPLIER.

Heading #2 (Group: 32-T)

Item #2 — 1 Pair of doors 101B, VESTIBULE 101 From STUDENT FORUM 102 — 100° LHRA/RHRA

1000, 1000 x 2150 x 45 - AL DR x AL FR - -

2	Continuous Hinge	Ives 112XY-83" US28	US28
1	Removable Mullion	Von Duprin KR4854-2150"-{BLANK}-689	689
1	Cylinder	Schlage MORT 20-001 CMK GMK	626
2	Door Pull	CBH CBH 7008-1 No. 1 C32D	US32D
2	Push Bar	Von Duprin 350-630--- 4' Bar	630
1	Surface Closer	LCN 4021 REGARM 689 45	689
1	Mounting Bracket	LCN 4020-18G	689
1	Electronic Closer	GYROTECH ADO GT8710 X FWH 628 NO ALTERNATE	
1	Overhead Door Stop	Glynn-Johnson 104S ADJ	630
		ADO LEAF	
1	Overhead Door Stop	Glynn-Johnson 104S US32D	US32D
1	Miscellaneous Hardware	Camden CM-160/21 INSTALL IN ADO HEADER	
2	Miscellaneous Hardware	Camden CM-60/4	
2	Miscellaneous Hardware	Camden CM-89S	

HARDWARE SUPPLIER SECTION 08710 TO SUPPLY & INSTALL AUTO OPERATOR.

ELECTRICAL CONTRACTOR TO PROVIDE 120VAC TO HEAD OF FRAME.
ELECTRICAL CONTRACTOR TO SUPPLY & INSTALL ALL LVW IN CONDUIT TO ALL ELECTRICAL COMPONENTS LISTED IN HARDWARE LIST. REFER TO WIRING DIAGRAM SUPPLIED BY HARDWARE SUPPLIER.

Heading #3 (Group: 08)

Item #3 | 1 Pair of doors 103A, FORUM FROM LEARNING COMMONS | 100° LHA/RHA

1000, 1000 x 2150 x 45 - AL DR x AL FR - -

2	Continuous Hinge	Ives 112XY-83" US28	US28
1	Removable Mullion	Von Duprin KR4854-2150"-{BLANK}-689	689
2	Exit Device	Von Duprin 35A-L -06 US26D	626/626
3	Cylinder	Schlage MORT 20-001 CMK GMK	626
1	Electric Strike	Von Duprin 6300- Shim 24VDC-630	630
1	Surface Closer	LCN 4040XP EDA 689 45	689
1	Electronic Closer	GYROTECH ADO GT8710 X FWH 628 NO ALTERNATE	
2	Overhead Door Stop	Glynn-Johnson 104S US32D	US32D
1	Miscellaneous Item	LCN 4040XP-18PA 689	689
1	Miscellaneous Hardware	Camden CM-160/21 INSTALL IN ADO HEADER	
2	Miscellaneous Hardware	Camden CM-60/4	
2	Miscellaneous Hardware	Camden CM-89S	
1	Miscellaneous Hardware	Camden CX-33	
1	Miscellaneous Hardware	MISC WIRING DIAGRAM	

HARDWARE SUPPLIER SECTION 08710 TO SUPPLY & INSTALL AUTO OPERATOR.

ELECTRICAL CONTRACTOR TO PROVIDE 120VAC TO HEAD OF FRAME.
ELECTRICAL CONTRACTOR TO SUPPLY & INSTALL ALL LVW IN CONDUIT TO ALL ELECTRICAL COMPONENTS LISTED IN HARDWARE LIST. REFER TO WIRING DIAGRAM SUPPLIED BY HARDWARE SUPPLIER.

Heading #4 (Group: 33-T)

Item #4 — 1 Pair of doors 103B, EXTERIOR From LEARNING COMMONS 103 — 100° LHRA/RHRA

1000, 1000 x 2150 x 57 - AL DR x AL FR - -

2	Continuous Hinge	Ives 112XY-83" US28	US28
1	Exit Device	Von Duprin 35A-EO-626- x 2150 Door 57-	626
1	Exit Device	Von Duprin 35A-NL-OP US26D	626/626
1	Cylinder	Schlage PRIMUS CORE 20-740 FP KWY FILE #1212	626
1	Cylinder	Schlage RIM 20-057-ICX	626
2	Door Pull	CBH CBH 7008-1 No. 1 C32D	US32D
2	Surface Closer	LCN 4021 REGARM 689 57	689
2	Mounting Bracket	LCN 4020-18G	689
2	Overhead Door Stop	Glynn-Johnson 104S US32D	US32D
2	Threshold	K.N. Crowder CT-46 X 48 AL	
2	Weatherstripping	K.N. Crowder W-24S x 42"	628
2	Miscellaneous Item	Schlage E.S. 679-05HM BY SCURITY CONTRACTOR	BLK
1	Miscellaneous Item	UNK FIXED MULLION BY FRAME SUPPLIER	
1	Miscellaneous Hardware	MISC WEATHERSTRIP BY ALUM DR/FR SUPPLIER	

WEATHERSEAL BY DOOR MANUFACTURER

Heading #5 (Group: 12)

Item #5 — 1 Single door 104A, LEARNING COMMONS 103 To WORKROOM 104 — 90° LH

950 x 2150 x 44 - HM DR x HM FR - -

3	Standard Hinge	Ives 5BB1 4 1/2" x 4" 626	626
1	Lockset	Schlage ND78 P6 RHO 626 CMK GMK	626
1	Kick Plate	Canadian Builders Hdw CBH 903 200 X 900 C32D	630
1	Wall Door Stop	Ives WS401/402CVX US26D	US26D

Heading #6 (Group: STORAGE NO CL OHS)

Item #6 — 1 Single door 105A, LEARNING COMMONS 103 From CART ROOM 105 — 90° LHR

950 x 2150 x 44 - HM DR x HM FR - -

3	Standard Hinge	Ives 5BB1 4 1/2" x 4" 626	626
1	Lockset	Schlage ND80 P6 RHO 626 CMK GMK	626
1	Kick Plate	Canadian Builders Hdw CBH 903 200 X 900 C32D	630
1	Overhead Door Stop	Glynn-Johnson 904S US32D	US32D

Heading #7 (Group: CLASS RM ADO)

Item #7 — 1 Single door 106A, STUDENT FORUM 102 To GENERAL OFFICE 106 — 90° LH

950 x 2150 x 44 - WD DR x AL FR - -

3	Standard Hinge	Ives 5BB1HW 5 X 4.5 652	652
1	Lockset	Schlage ND78 P6 RHO 626 CMK GMK	626
1	Electric Strike	Von Duprin 6211 FSE CON 12/16/24/28 VAC/VDC	630
1	Electronic Closer	GYROTECH ADO GT8710 X FWH PULL SIDE 628 NO	
1	Kick Plate	Canadian Builders Hdw CBH 903 200 X 900 C32D	630
1	Wall Door Stop	Ives WS401/402CVX US26D	US26D
1	Miscellaneous Hardware	Camden CM-160/21 INSTALL IN ADO HEADER	
2	Miscellaneous Hardware	Camden CM-60/4	
2	Miscellaneous Hardware	Camden CM-89S	
1	Miscellaneous Hardware	Camden CX-33	
1	Miscellaneous Hardware	MISC WIRING DIAGRAM	

HARDWARE SUPPLIER SECTION 08710 TO SUPPLY & INSTALL AUTO OPERATOR.

ELECTRICAL CONTRACTOR TO PROVIDE 120VAC TO HEAD OF FRAME.
ELECTRICAL CONTRACTOR TO SUPPLY & INSTALL ALL LVW IN CONDUIT TO ALL ELECTRICAL COMPONENTS LISTED IN HARDWARE LIST. REFER TO WIRING DIAGRAM SUPPLIED BY HARDWARE SUPPLIER.

Heading #8 (Group: CLASS RM CL WS)

Item #8 — 1 Single door 106B, RECEIVING/CUSTODIAN 117 To GENERAL OFFICE 106 — 90° LH

Item #9 — 1 Single door 117A, STUDENT FORUM 102 To RECEIVING/CUSTODIAN 117 — 90° LH

950 x 2150 x 44 - HM DR x HM FR - 45MIN

6	Standard Hinge	Ives 5BB1 4 1/2" x 4" 626	626
2	Lockset	Schlage ND70P6D RHO CMK GMK	626
2	Surface Closer	LCN 4040XP EDA 689 LH 44	689
2	Kick Plate	Canadian Builders Hdw CBH 903 200 X 900 C32D	630
2	Wall Door Stop	Ives WS401/402CVX US26D	US26D

Heading #9 (Group: CLASS RM INT CL SOHS)

Item #10	1 Single door 107A, STUDENT FORUM 102 To WORKROOM 107		90° LH
	950 x 2150 x 44 - WD DR x HM FR - -		

3	Standard Hinge	Ives 5BB1 4 1/2" x 4" 626	626
1	Lockset	Schlage ND78 P6 RHO 626 CMK GMK	626
1	Surface Closer	LCN 4040XP REG	689
1	Kick Plate	Canadian Builders Hdw CBH 903 200 X 900 C32D	630
1	Overhead Door Stop	Glynn-Johnson 904S US32D	US32D
1	Wall Door Stop	Ives WS401/402CVX US26D	US26D

Heading #10 (Group: 12)

Item #11	1 Single door 107B, GENERAL OFFICE 106 To WORKROOM 107	90° RH
Item #12	1 Single door 111A, GENERAL OFFICE 106 To OSR 111	90° LH
Item #13	1 Single door 115A, STUDENT FORUM 102 To SEMINAR 115	90° LH
Item #14	1 Single door 130A, CORRIDOR 129 To CLASSROOM 1 130	90° RH
Item #15	1 Single door 131A, CORRIDOR 129 To CLASSROOM 2 131	90° LH
Item #16	1 Single door 137A, CORRIDOR 129 To SPEC. ED 137	90° RH
Item #17	1 Single door 145A, CORRIDOR 140 To WORKROOM 145	90° LH
Item #18	1 Single door 146A, CORRIDOR 140 To KINDERGARTEN 146	90° RH
Item #19	1 Single door 147A, CORRIDOR 140 To KINDERGARTEN 147	90° LH
Item #20	1 Single door 148A, CORRIDOR 140 To KINDERGARTEN 148	90° RH
Item #21	1 Single door 149A, CORRIDOR 140 To KINDERGARTEN 149	90° LH
Item #22	1 Single door 151A, CORRIDOR 140 To KINDERGARTEN 151	90° RH
Item #23	1 Single door 153A, CORRIDOR 140 To KINDERGARTEN 153	90° LH
Item #24	1 Single door 204A, CORRIDOR 203 To SEMINAR 3 204	90° LH
Item #25	1 Single door 207A, CORRIDOR 203 To CLASSROOM 3 207	90° RH
Item #26	1 Single door 208A, CORRIDOR 203 To CLASSROOM 4 208	90° LH
Item #27	1 Single door 210A, CORRIDOR 203 To CLASSROOM 5 210	90° LH
Item #28	1 Single door 211A, CORRIDOR 203 To CLASSROOM 6 211	90° RH
Item #29	1 Single door 212A, CORRIDOR 203 To CLASSROOM 7 212	90° LH
Item #30	1 Single door 220A, CORRIDOR 219 To CLASSROOM 8 220	90° RH
Item #31	1 Single door 221A, CORRIDOR 219 To CLASSROOM 9 221	90° LH
Item #32	1 Single door 222A, CORRIDOR 219 FROM SEMINAR 5 222	90° RH
Item #33	1 Single door 223A, CORRIDOR 219 To CLASSROOM 10 223	90° RH
Item #34	1 Single door 224A, CORRIDOR 219 To CLASSROOM 11 224	90° LH
Item #35	1 Single door 225A, CORRIDOR 219 To CLASSROOM 12 225	90° RH
Item #36	1 Single door 226A, CORRIDOR 219 To CLASSROOM 13 226	90° LH
Item #37	1 Single door 229A, CORRIDOR 219 To WORKROOM 229	90° RH
Item #38	1 Single door 230A, CORRIDOR 219 To CLASSROOM 14 230	90° RH
Item #39	1 Single door 231A, CORRIDOR 219 To CLASSROOM 15 231	90° LH
Item #40	1 Single door 232A, CORRIDOR 219 To CLASSROOM 16 232	90° RH
Item #41	1 Single door 233A, CORRIDOR 219 To CLASSROOM 17 233	90° LH
Item #42	1 Single door 234A, CORRIDOR 219 To SEMINAR 6 234	90° LH
Item #43	1 Single door 235A, CORRIDOR 219 To CLASSROOM 18 235	90° RH
Item #44	1 Single door 236A, CORRIDOR 219 To CLASSROOM 19 236	90° LH
Item #45	1 Single door 237A, CORRIDOR 219 To CLASSROOM 20 237	90° RH
Item #46	1 Single door 238A, CORRIDOR 219 To SCIENCE 238	90° RH
Item #47	1 Single door 239A, CORRIDOR 219 To ART 239	90° LH

950 x 2150 x 44 - WD DR x HM FR - -

111	Standard Hinge	Ives 5BB1 4 1/2" x 4" 626	626
37	Lockset	Schlage ND78 P6 RHO 626 CMK GMK	626
37	Kick Plate	Canadian Builders Hdw CBH 903 200 X 900 C32D	630
37	Wall Door Stop	Ives WS401/402CVX US26D	US26D

Heading #11 (Group: 05)

Item #48	1 Single door 108A, GENERAL OFFICE 106 To OFFICE 108	90° LH
Item #49	1 Single door 109A, GENERAL OFFICE 106 To OFFICE 109	90° RH
Item #50	1 Single door 110A, GENERAL OFFICE 106 To OFFICE 110	90° RH
Item #51	1 Single door 308A, CORRIDOR 302 To OFFICE 308	90° RH

950 x 2150 x 44 - WD DR x HM FR - -

12	Standard Hinge	Ives 5BB1 4 1/2" x 4" 626	626
4	Lockset	Schlage ND78 P6 RHO 626 CMK GMK	626
4	Kick Plate	Canadian Builders Hdw CBH 903 200 X 900 C32D	630
4	Wall Door Stop	Ives WS401/402CVX US26D	US26D
4	Accessory	Canadian Builders Hdw CBH 61	630

Heading #12 (Group: 02)

Item #52	1 Single door 112A, GENERAL OFFICE 106 To HEALTH 112	90° LH
Item #53	1 Single door 134A, SPEC. ED 137 To SENSORY 134	90° RH
Item #54	1 Single door 135A, CORRIDOR 129 To SAFE ROOM 135	90° LH
Item #55	1 Single door 136A, CORRIDOR 129 To THERAPY 136	90° RH
Item #56	1 Single door 136B, SPEC. ED 137 To THERAPY 136	90° LH

950 x 2150 x 44 - WD DR x HM FR - -

15	Standard Hinge	Ives 5BB1 4 1/2" x 4" 626	626
5	Lockset	Schlage ND70P6D RHO CMK GMK	626
5	Kick Plate	Canadian Builders Hdw CBH 903 200 X 900 C32D	630
5	Wall Door Stop	Ives WS401/402CVX US26D	US26D

Heading #13 (Group: 19)

Item #57 — 1 Single door 113A, HEALTH 112 To WASHROOM 113 — 90° LH

950 x 2150 x 44 - WD DR x HM FR - -

3	Standard Hinge	Ives 5BB1 4 1/2" x 4" 626	626
1	Lockset	Schlage L9496 P6 06 626 LH CMK GMK	626
1	Kick Plate	Canadian Builders Hdw CBH 903 200 X 900 C32D	630
1	Wall Door Stop	Ives WS401CCV	626

Heading #14 (Group: 06)

Item #58 — 1 Single door 114A, GENERAL OFFICE 106 To STORAGE 114 — 90° RH

Item #59 — 1 Single door 307A, CORRIDOR 302 To STORAGE 307 — 90° LH

950 x 2150 x 44 - WD DR x HM FR - -

6	Standard Hinge	Ives 5BB1 4 1/2" x 4" 626	626
2	Lockset	Schlage ND80 P6 RHO 626 CMK GMK	626
2	Kick Plate	Canadian Builders Hdw CBH 903 200 X 900 C32D	630
2	Wall Door Stop	Ives WS401/402CVX US26D	US26D

Heading #15 (Group: 05)

Item #60 — 1 Single door 116A, STUDENT FORUM 102 To OFFICE 116 — 90° RH

950 x 2150 x 44 - HM DR x HM FR - -

3	Standard Hinge	Ives 5BB1 4 1/2" x 4" 626	626
1	Lockset	Schlage ND78 P6 RHO 626 CMK GMK	626
1	Kick Plate	Canadian Builders Hdw CBH 903 200 X 900 C32D	630
1	Wall Door Stop	Ives WS401/402CVX US26D	US26D
1	Accessory	Canadian Builders Hdw CBH 61	630

Heading #16 (Group: EXT STORAGE)

Item #61 — 1 Pair of doors 117B, EXTERIOR From RECEIVING/CUSTODIAN 117

1000, 1000 x 2150 x 44 - HM DR x HM FR - -

6	Standard Hinge	Ives 5BB1HW 5 X 4.5 NRP 630	630
2	Flush Bolt	Ives FB458 12" 626	626
		INACTIVE LEAF	
1	Lockset	Schlage L9480T LLL 06B 626 09-544 L283-150	626
		ACT LEAF	
1	Cylinder	Schlage PRIMUS CORE 20-740 FP KWY FILE #1212	626
1	Door Pull	Canadian Builders Hdw CBH 350	630
		MOUNT EXTERIOR	
1	Astragal	K.N. Crowder W-8S X8 4"	627
2	Surface Closer	LCN 4040XP SHCUSH	689
2	Kick Plate	Canadian Builders Hdw CBH 903 200 X 950 C32D	630
1	Threshold	K.N. Crowder CT-46 X 84" AL	627
1	Weatherstripping	K.N. Crowder W-20S(HEAD) X 84"	628
2	Weatherstripping	K.N. Crowder W-24S-CA x 48"	CA
2	Weatherstripping	K.N. Crowder W-50S-CAx84" Opening	CA
2	Miscellaneous Item	Schlage E.S. 679-05HM BY SCURITY CONTRACTOR	BLK

Heading #17 (Group: 45)

Item #62 — 1 Single door 118A, RECEIVING/CUSTODIAN 117 To ELECTRICAL 118 — 90° LH

950 x 2150 x 44 - HM DR x HM FR - 45MIN

3	Standard Hinge	Ives 5BB1 4 1/2" x 4" 626	626
1	Lockset	Schlage ND80 P6 RHO 626 CMK GMK	626
1	Surface Closer	LCN 1461 REGARM 689 44	689
1	Kick Plate	Canadian Builders Hdw CBH 903 200 X 900 C32D	630
1	Wall Door Stop	Ives WS401/402CVX US26D	US26D
1	Gasketing	K.N. Crowder W-22 X18'	BLK

Heading #18 (Group: 45)

Item #63 — 1 Single door 120A, CORRIDOR To SEMINAR — 90° RH

950 x 2150 x 44 - WD DR x HM FR - -

3	Standard Hinge	Ives 5BB1 4 1/2" x 4" 626	626
1	Lockset	Schlage ND80 P6 RHO 626 CMK GMK	626
1	Surface Closer	LCN 1461 REGARM 689 44	689
1	Kick Plate	Canadian Builders Hdw CBH 903 200 X 900 C32D	630
1	Wall Door Stop	Ives WS401/402CVX US26D	US26D
1	Gasketing	K.N. Crowder W-22 X18'	BLK

Heading #19 (Group: CLASS RM CL WS)

Item #64 — 1 Single door 121A, STAGE 122 To NUTRITION 121 — 100° LH

950 x 2150 x 44 - HM DR x HM FR - 20MIN

3	Standard Hinge	Ives 5BB1 4 1/2" x 4" 626	626
1	Lockset	Schlage ND70P6D RHO CMK GMK	626
1	Surface Closer	LCN 4040XP EDA 689 LH 44	689
1	Kick Plate	Canadian Builders Hdw CBH 903 200 X 900 C32D	630
1	Wall Door Stop	Ives WS401/402CVX US26D	US26D

Heading #20 (Group: 30)

Item #65 — 1 Single door 122A, LEARNING COMMONS 103 To STAGE 122 — 90° LH

950 x 2150 x 44 - HM DR x AL FR - 20MIN

3	Standard Hinge	Ives 5BB1 4 1/2" x 4" 626	626
1	Lockset	Schlage ND70P6D RHO CMK GMK	626
1	Surface Closer	LCN 4040XP EDA 689 LH 44	689
1	Kick Plate	Canadian Builders Hdw CBH 903 200 X 900 C32D	630
1	Wall Door Stop	Ives WS401/402CVX US26D	US26D

Heading #21 (Group: STAGE EMHO)

Item #66	1 Single door 122B, STUDENT FORUM 102 From STAGE 122	180° LHR
Item #67	1 Single door 122C, STUDENT FORUM 102 From STAGE 122	180° RHR

950 x 2150 x 44 - HM DR x AL FR - 20MIN

6	Standard Hinge	Ives 5BB1 4 1/2" x 4" 626	626
2	Lockset	Schlage ND78 P6 RHO 626 CMK GMK	626
1	Surface Closer	LCN 4040XP EDA 689 LH 44	689
1	Surface Closer	LCN 4040XP EDA 689 RH 44	689
2	Kick Plate	Canadian Builders Hdw CBH 903 200 X 900 C32D	630
2	Electro-Magnetic Holder	LCN SEM 7810- 689 X SEM7810- E200	689
2	Electro-Magnetic Holder	LCN SEM 7850 689	689

Heading #22 (Group: 31)

Item #68	1 Single door 124A, GYMNASIUM 125 From CORRIDOR 124	90° RHR
Item #69	1 Single door 302A, FORUM FROM CC CORR	90° RHR

950 x 2150 x 44 - HM DR x HM FR - -

6	Standard Hinge	Ives 5BB1HW 4 1/2" x 4 1/2" 626	626
2	Exit Device	Von Duprin 98-L-626-950 x -RHR-996L-R/626	626/626
2	Cylinder	Schlage RIM 20-021 CMK GMK	626
2	Surface Closer	LCN 4040XP EDA 689 LH 44	689
2	Kick Plate	Canadian Builders Hdw CBH 903 200 X 900 C32D	630
2	Wall Door Stop	Ives WS401/402CVX US26D	US26D
2	Gasketing	K.N. Crowder W-22 X18'	BLK

Heading #23 (Group: 54)

Item #70 — 1 Pair of doors 125A, CORRIDOR 129 From GYMNASIUM 125 — 90°,180° LHRA/RHRA

1000, 1000 x 2150 x 44 - HM DR x HM FR - 20MIN

INSTALL ADO ACT LEAF

6	Standard Hinge	Ives 5BB1HW 5X 4.5 NRP 652	652
2	Securing Device	Schlage XB11-979	626
1	Removable Mullion	Von Duprin KR9854-{BLANK }-689	689
2	Exit Device	Von Duprin 98-L-F-2SI-06- 4' -499F US26D	626/626
1	Cylinder	Schlage MORT 20-001 CMK GMK	626
2	Cylinder	Schlage RIM 20-021 CMK GMK	626
1	Electric Strike	Von Duprin 6300- Shim 24VDC-630	630
		LHR	
1	Astragal	K.N. Crowder W-25 84"	628
		ASTRAGAL SET	
1	Surface Closer	LCN 4040XP EDA 689 44	689
1	Electronic Closer	GYROTECH ADO GT8710 X FWH 628 NO ALTERNATE	
		LHR	
2	Kick Plate	Canadian Builders Hdw CBH 903 200 X 950 C32D	630
2	Wall Door Stop	Ives WS401/402CVX US26D	US26D
1	Weatherstripping	K.N. Crowder W-22-BL x 18'	BL
2	Weatherstripping	K.N. Crowder W-24S-CA x 48"	CA
1	Miscellaneous Hardware	Camden CM-160/21 INSTALL IN ADO HEADER	
2	Miscellaneous Hardware	Camden CM-60/4	
2	Miscellaneous Hardware	Camden CM-89S	
1	Miscellaneous Hardware	MISC WIRING DIAGRAM	

HARDWARE SUPPLIER SECTION 08710 TO SUPPLY & INSTALL AUTO OPERATOR.

ELECTRICAL CONTRACTOR TO PROVIDE 120VAC TO HEAD OF FRAME.
ELECTRICAL CONTRACTOR TO SUPPLY & INSTALL ALL LVW IN CONDUIT TO ALL ELECTRICAL COMPONENTS LISTED IN HARDWARE LIST. REFER TO WIRING DIAGRAM SUPPLIED BY HARDWARE SUPPLIER.

Heading #24 (Group: 21)

Item #71 — 1 Pair of doors 125B, EXTERIOR From GYMNASIUM 125 — 100° LHRA/RHRA

1000, 1000 x 2150 x 57 - AL DR x AL FR - -

2	Continuous Hinge	Ives 112XY-83" US28	US28
2	Exit Device	Von Duprin 35A-EO-626- x 2150 Door 57-	626
2	Surface Closer	LCN 4040XP EDA 689 57	689
2	Overhead Door Stop	Glynn-Johnson 104S US32D	US32D
2	Threshold	K.N. Crowder CT-46 X 48 AL	
2	Weatherstripping	K.N. Crowder W-24S x 42"	628
2	Miscellaneous Item	LCN 4040XP-18PA 689	689
2	Miscellaneous Item	Schlage E.S. 679-05HM BY SCURITY CONTRACTOR	BLK
1	Miscellaneous Item	UNK FIXED MULLION BY FRAME SUPPLIER	
2	Miscellaneous Hardware	MISC WEATHERSTRIP BY ALUM DR/FR SUPPLIER	

WEATHERSEAL BY DOOR MANUFACTURER

Heading #25 (Group: EXT GYM PR HM)

Item #72 — 1 Pair of doors 125C, EXTERIOR From GYMNASIUM 125 — 100° LHRA

1000, 1000 x 2150 x 44 - HM DR x HM FR - -

8	Standard Hinge	Ives 5BB1HW 5 X 4.5 NRP 630	630
2	Exit Device	Von Duprin 98-EO 4'	626
2	Surface Closer	LCN 4040XP EDA 689 44	689
2	Kick Plate	Canadian Builders Hdw CBH 903 200 X 950 C32D	630
2	Overhead Door Stop	Glynn-Johnson 105S	630
2	Threshold	K.N. Crowder CT-46 X 48 AL	
2	Weatherstripping	K.N. Crowder W-20S(HEAD) X 48"	628
2	Weatherstripping	K.N. Crowder W-24S x 42"	628
4	Weatherstripping	K.N. Crowder W-50S-CAx84" Opening	CA
2	Miscellaneous Item	Schlage E.S. 679-05HM BY SCURITY CONTRACTOR	BLK
1	Miscellaneous Item	UNK FIXED MULLION BY FRAME SUPPLIER	

Heading #26 (Group: GYM PR ULC)

Item #73 — 1 Pair of doors 125D, CORRIDOR 129 From GYMNASIUM 125 — 90° LHRA

1000, 1000 x 2150 x 44 - HM DR x HM FR - 20MIN

6	Standard Hinge	Ives 5BB1HW 5X 4.5 NRP 652	652
2	Securing Device	Schlage XB11-979	626
2	Exit Device	Von Duprin 98-L-F-2SI-06- 4' -499F US26D	626/626
2	Cylinder	Schlage RIM 20-021 CMK GMK	626
2	Surface Closer	LCN 4040XP EDA 689 44	689
2	Kick Plate	Canadian Builders Hdw CBH 903 200 X 950 C32D	630
2	Wall Door Stop	Ives WS401/402CVX US26D	US26D
2	Weatherstripping	K.N. Crowder W-24S-CA x 48"	CA
2	Gasketing	K.N. Crowder W-22 X18'	BLK
1	Miscellaneous Item	UNK FIXED MULLION BY FRAME SUPPLIER	

Heading #27 (Group: 23)

Item #74 — 1 Single door 126A, GYMNASIUM 125 To CHANGE ROOM 126 — 90° LH

Item #75 — 1 Single door 127A, GYMNASIUM 125 To CHANGE ROOM 127 — 90° RH

950 x 2150 x 44 - HM DR x HM FR - -

6	Standard Hinge	Ives 5BB1HW 4 1/2" x 4 1/2" 626	626
2	Dead Lock	Schlage B663 P6 626 CMK GMK	626
2	Door Pull	Canadian Builders Hdw CBH 380 101 X 500 CF D.B.	630
2	Door Pull	CBH CBH 9023 C28 44	US28
1	Surface Closer	LCN 4040XP EDA 689 LH 44	689
1	Surface Closer	LCN 4040XP EDA 689 RH 44	689
2	Kick Plate	Canadian Builders Hdw CBH 903 200 X 900 C32D	630
2	Wall Door Stop	Ives WS401/402CVX US26D	US26D

Heading #28 (Group: 22)

Item #76	1 Single door 128AA, GYMNASIUM 125 To GYM STORAGE A 128	90° RH
Item #77	1 Single door 128BA, GYMNASIUM 125 To GYM STORAGE B 128	90° RH

1100 x 2150 x 44 - HM DR x HM FR - -

6	Standard Hinge	Ives 5BB1HW 5 X 4.5 652	652
2	Dead Lock	Schlage B663 P6 626 CMK GMK	626
2	Cylinder	CBH CBH 353 INSTALL PULL SIDE	US32D
2	Door Pull	Canadian Builders Hdw CBH 380 101 X 500 CFC	630
2	Surface Closer	LCN 4040XP REG	689
2	Kick Plate	Canadian Builders Hdw CBH 903 200 X 1050 C32D	630
2	Wall Door Stop	Ives WS401/402CVX US26D	US26D

Heading #29 (Group: EXT STAIR ALUM ADO)

Item #78	1 Pair of doors 132A, EXTERIOR From STAIR A 132	100° LHRA/RHRA
Item #79	1 Pair of doors 150A, EXTERIOR From STAIR B 150	100° LHRA/RHRA
Item #80	1 Pair of doors 150C, EXTERIOR From STAIR B 150	90°,180° LHRA

1000, 1000 x 2150 x 57 - AL DR x AL FR - -

INSTALL ADO ACT LEAF

6	Continuous Hinge	Ives 112XY-83" US28	US28
3	Exit Device	Von Duprin 35A-EO-626- x 2150 Door 57-	626
3	Exit Device	Von Duprin 35A-NL-OP US26D	626/626
3	Cylinder	Schlage PRIMUS CORE 20-740 FP KWY FILE #1212	626
3	Cylinder	Schlage RIM 20-057-ICX	626
3	Electric Strike	Von Duprin 6300- Shim 24VDC-630	630
6	Door Pull	CBH CBH 7008-1 No. 1 C32D	US32D
3	Surface Closer	LCN 4021 REGARM 689 57	689
3	Mounting Bracket	LCN 4020-18G	689
3	Electronic Closer	GYROTECH ADO GT8710 X FWH 628 NO ALTERNATE	
3	Overhead Door Stop	Glynn-Johnson 104S ADJ	630
3	Overhead Door Stop	Glynn-Johnson 104S US32D	US32D
6	Threshold	K.N. Crowder CT-46 X 48 AL	
6	Weatherstripping	K.N. Crowder W-24S x 42"	628
6	Miscellaneous Item	Schlage E.S. 679-05HM BY SCURITY CONTRACTOR	BLK
3	Miscellaneous Item	LCN 8310-802	PLA
3	Miscellaneous Item	UNK FIXED MULLION BY FRAME SUPPLIER	
3	Miscellaneous Hardware	Camden CM-160/21 INSTALL IN ADO HEADER	
6	Miscellaneous Hardware	Camden CM-60/4	
6	Miscellaneous Hardware	Camden CM-89S	
3	Miscellaneous Hardware	Camden CX-33	
3	Miscellaneous Hardware	MISC WEATHERSTRIP BY ALUM DR/FR SUPPLIER	
3	Miscellaneous Hardware	MISC WIRING DIAGRAM	

WEATHERSEAL BY DOOR MANUFACTURER

HARDWARE SUPPLIER SECTION 08710 TO SUPPLY & INSTALL AUTO OPERATOR.

ELECTRICAL CONTRACTOR TO PROVIDE 120VAC TO HEAD OF FRAME.
ELECTRICAL CONTRACTOR TO SUPPLY & INSTALL ALL LVW IN CONDUIT TO ALL ELECTRICAL COMPONENTS LISTED IN HARDWARE LIST. REFER TO WIRING DIAGRAM SUPPLIED BY HARDWARE SUPPLIER.

Heading #30 (Group: VEST PR ULC ADO)

Item #81	1 Pair of doors 132B, STAIR A 132 From CORRIDOR 129	90°,180° LHRA
Item #82	1 Pair of doors 150B, STAIR B 150 From CORRIDOR 140	90°,180° LHRA

1000, 1000 x 2150 x 44 - HM DR x HM FR - 45MIN

12	Standard Hinge	Ives 5BB1HW 5 X 4.5 652	652
4	Exit Device	Von Duprin 98-L-BE-F -06 US26D	626/626
2	Electric Strike	Von Duprin 6300- Shim 24VDC-630	630
		RHR	
2	Surface Closer	LCN 4040XP EDA 689 44	689
		LHR	
2	Electronic Closer	GYROTECH ADO GT8710 X FWH 628 NO ALTERNATE	
		RHR	
4	Kick Plate	Canadian Builders Hdw CBH 903 200 X 950 C32D	630
4	Wall Door Stop	Ives WS401/402CVX US26D	US26D
4	Weatherstripping	K.N. Crowder W-24S-CA x 48"	CA
4	Gasketing	K.N. Crowder W-22 X18'	BLK
2	Miscellaneous Item	UNK FIXED MULLION BY FRAME SUPPLIER	
2	Miscellaneous Hardware	Camden CM-160/21 INSTALL IN ADO HEADER	
4	Miscellaneous Hardware	Camden CM-60/4	
4	Miscellaneous Hardware	Camden CM-89S	
2	Miscellaneous Hardware	Camden CX-33	
2	Miscellaneous Hardware	MISC WIRING DIAGRAM	

FIXED MULLION BY FRAME SUPPLIER

HARDWARE SUPPLIER SECTION 08710 TO SUPPLY & INSTALL AUTO OPERATOR.

ELECTRICAL CONTRACTOR TO PROVIDE 120VAC TO HEAD OF FRAME.
ELECTRICAL CONTRACTOR TO SUPPLY & INSTALL ALL LVW IN CONDUIT TO ALL ELECTRICAL COMPONENTS LISTED IN HARDWARE LIST. REFER TO WIRING DIAGRAM SUPPLIED BY HARDWARE SUPPLIER.

Heading #31 (Group: 61)

Item #83 — 1 Single door 133A, CORRIDOR 129 To STAFF ROOM 133 — 90° RH

950 x 2150 x 44 - HM DR x HM FR - -

3	Standard Hinge	Ives 5BB1HW 4 1/2" x 4 1/2" 626	626
1	Lockset	Schlage ND78 P6 RHO 626 CMK GMK	626
1	Surface Closer	LCN 1461 REGARM 689 44	689
1	Kick Plate	Canadian Builders Hdw CBH 903 200 X 900 C32D	630
1	Wall Door Stop	Ives WS401/402CVX US26D	US26D
1	Weatherstripping	K.N. Crowder W-24S x 42"	628
1	Gasketing	K.N. Crowder W-22 X18'	BLK

Heading #32 (Group: 10)

Item #84 — 1 Single door 141A, CORRIDOR 140 To LAN 141 — 90° RH

950 x 2150 x 44 - HM DR x HM FR - -

3	Standard Hinge	Ives 5BB1 4 1/2" x 4" 626	626
1	Lockset	Schlage ND80 P6 RHO 626 CMK GMK	626
1	Surface Closer	LCN 1461 REGARM 689 44	689
1	Kick Plate	Canadian Builders Hdw CBH 903 200 X 900 C32D	630
1	Wall Door Stop	Ives WS401/402CVX US26D	US26D

Heading #33 (Group: WR ADO OHS)

Item #85 — 1 Single door 142A, CORRIDOR 140 To UNIVERSALE WR 142 — 90° RH

950 x 2150 x 44 - HM DR x HM FR - -

3	Standard Hinge	Ives 5BB1HW 4 1/2" x 4 1/2" 626	626
1	Lockset	Schlage ND80 P6 RHO 626 CMK GMK	626
1	Electric Strike	Von Duprin 6211- FS-630	630
1	Electronic Closer	GYROTECH ADO GT8710 X FWH PULL SIDE 628 NO	
1	Kick Plate	Canadian Builders Hdw CBH 903 300 X 900 C32D	630
1	Overhead Door Stop	Glynn-Johnson 104S US32D	US32D
1	Miscellaneous Hardware	Camden CM-160/21 INSTALL IN ADO HEADER	
1	Miscellaneous Hardware	Camden CX-WC13AXFM-PS	
1	Miscellaneous Hardware	Camden CX-WEC10K2	
1	Miscellaneous Hardware	MISC WIRING DIAGRAM	

HARDWARE SUPPLIER SECTION 08710 TO SUPPLY & INSTALL AUTO OPERATOR.

ELECTRICAL CONTRACTOR TO PROVIDE 120VAC TO HEAD OF FRAME.
ELECTRICAL CONTRACTOR TO SUPPLY & INSTALL ALL LVW IN CONDUIT TO ALL ELECTRICAL COMPONENTS LISTED IN HARDWARE LIST. REFER TO WIRING DIAGRAM SUPPLIED BY HARDWARE SUPPLIER.

Heading #34 (Group: 19)

Item #86 — 1 Single door 143A, CORRIDOR 140 To WASHROOM 143 — 90° LH

Item #87 — 1 Single door 144A, CORRIDOR 140 To WASHROOM 144 — 90° LH

950 x 2150 x 44 - HM DR x HM FR - -

6	Standard Hinge	Ives 5BB1 4 1/2" x 4" 626	626
2	Lockset	Schlage L9496 P6 06 626 LH CMK GMK	626
2	Kick Plate	Canadian Builders Hdw CBH 903 200 X 900 C32D	630
2	Wall Door Stop	Ives WS401CCV	626

Heading #35 (Group: 58)

Item #88 1 Pair of doors 152A, EXTERIOR From CORRIDOR 152 100° LHRA

1000, 1000 x 2150 x 44 - HM DR x HM FR - -

6	Standard Hinge	Ives 5BB1HW 5 X 4.5 NRP 630	630
1	Exit Device	Von Duprin 98-DT 4'	626
1	Exit Device	Von Duprin 98-NL 4'	626
1	Cylinder	Schlage PRIMUS CORE 20-740 FP KWY FILE #1212	626
1	Cylinder	Schlage RIM 20-057-ICX	626
1	Electric Strike	Von Duprin 6300- Shim 24VDC-630	630
2	Surface Closer	LCN 4040XP EDA 689 44	689
1	Electronic Closer	GYROTECH ADO GT8710 X FWH 628 NO ALTERNATE	
2	Kick Plate	Canadian Builders Hdw CBH 903 200 X 950 C32D	630
2	Overhead Door Stop	Glynn-Johnson 105S	630
2	Threshold	K.N. Crowder CT-46 X 48 AL	
2	Weatherstripping	K.N. Crowder W-20S(HEAD) X 48"	628
2	Weatherstripping	K.N. Crowder W-24S x 42"	628
4	Weatherstripping	K.N. Crowder W-50S-CAx84" Opening	CA
2	Miscellaneous Item	Schlage E.S. 679-05HM BY SCURITY CONTRACTOR	BLK
1	Miscellaneous Item	UNK FIXED MULLION BY FRAME SUPPLIER	
1	Miscellaneous Hardware	Camden CM-160/21 INSTALL IN ADO HEADER	
2	Miscellaneous Hardware	Camden CM-60/4	
2	Miscellaneous Hardware	Camden CM-89S	
1	Miscellaneous Hardware	Camden CX-33	
1	Miscellaneous Hardware	MISC WIRING DIAGRAM	

HARDWARE SUPPLIER SECTION 08710 TO SUPPLY & INSTALL AUTO OPERATOR.

ELECTRICAL CONTRACTOR TO PROVIDE 120VAC TO HEAD OF FRAME.
ELECTRICAL CONTRACTOR TO SUPPLY & INSTALL ALL LVW IN CONDUIT TO ALL ELECTRICAL COMPONENTS LISTED IN HARDWARE LIST. REFER TO WIRING DIAGRAM SUPPLIED BY HARDWARE SUPPLIER.

Heading #36 (Group: 03)

Item #89 — 1 Single door 154A, CORRIDOR 140 To STORAGE 154 — 90° LH

950 x 2150 x 44 - HM DR x HM FR - -

3	Standard Hinge	Ives 5BB1 4 1/2" x 4" 626	626
1	Lockset	Schlage ND80 P6 RHO 626 CMK GMK	626
1	Surface Closer	LCN 1461 REG DEL	689
1	Kick Plate	Canadian Builders Hdw CBH 903 200 X 900 C32D	630
1	Wall Door Stop	Ives WS401/402CVX US26D	US26D

Heading #37 (Group: 03)

Item #90 — 1 Single door 154B, OUTDOOR STORAGE 155 To STORAGE 154 — 90° LHR

950 x 2150 x 44 - HM DR x HM FR - 1.5HR

3	Standard Hinge	Ives 5BB1 4 1/2" x 4" 626	626
1	Lockset	Schlage ND80 P6 RHO 626 CMK GMK	626
1	Surface Closer	LCN 1461 REG DEL	689
1	Kick Plate	Canadian Builders Hdw CBH 903 200 X 900 C32D	630
1	Wall Door Stop	Ives WS401/402CVX US26D	US26D

Heading #38 (Group: 11)

Item #91 — 1 Single door 155A, EXTERIOR From OUTDOOR STORAGE 155 — 100° LHR

1100 x 2150 x 44 - HM DR x HM FR - -

3	Standard Hinge	Ives 5BB1HW 5 X 4.5 NRP 630	630
1	Dead Lock	Schlage B660T	626
1	Cylinder	CBH CBH 352 C26D 44 -2 1/8" MTD EXTERIOR SIDE	US26D
1	Cylinder	Schlage PRIMUS CORE 20-740 FP KWY FILE #1212	626
1	Door Pull	CBH CBH 9023 C28 44 TB MTD ON INTERIOR SIDE	US28
1	Surface Closer	LCN 4040XP SHCUSH	689
1	Kick Plate	Canadian Builders Hdw CBH 903 200 X 1050 C32D	630
1	Threshold	K.N. Crowder CT-46 X 48 AL	
1	Weatherstripping	K.N. Crowder W-20S(HEAD) X 48"	628
1	Weatherstripping	K.N. Crowder W-24S-CA x 48"	CA
2	Weatherstripping	K.N. Crowder W-50S-CAx84" Opening	CA
1	Miscellaneous Item	Schlage E.S. 679-05HM BY SCURITY CONTRACTOR	BLK

NOTE; INSTALL CBH 400 ON INSIDE OF DOOR

Heading #39 (Group: STORAGE CUSH SS)

Item #92 — 1 Single door 157A, CORRIDOR 129 From ELEVATOR MACH. RM 147 — 100° RHR

950 x 2150 x 44 - HM DR x HM FR - 45MIN

3	Standard Hinge	Ives 5BB1 4 1/2" x 4" 626	626
1	Lockset	Schlage ND80 P6 RHO 626 CMK GMK	626
1	Surface Closer	LCN 1461 SCUSH 689 44	689
1	Kick Plate	Canadian Builders Hdw CBH 903 200 X 900 C32D	630
1	Gasketing	K.N. Crowder CT-54 W/SHIM X 42"	627
1	Gasketing	K.N. Crowder W-22 X18'	BLK

Heading #40 (Group: 27-301)

Item #93 | 1 Pair of doors 301A, EXTERIOR From VESTIBULE 301 | 100° LHRA/RHRA

1000, 1000 x 2150 x 57 - AL DR x AL FR - -

2	Continuous Hinge	Ives 112XY-83" US28	US28
1	Removable Mullion	Von Duprin KR4854-2150"-{BLANK}-689	689
1	Exit Device	Von Duprin 35A-EO-626- x 2150 Door 57-	626
1	Exit Device	Von Duprin 35A-NL-OP US26D	626/626
		ACT LEAF	
1	Cylinder	Schlage MORT 20-001 CMK GMK	626
1	Cylinder	Schlage PRIMUS CORE 20-740 FP KWY FILE #1212	626
1	Cylinder	Schlage RIM 20-057-ICX	626
1	Electric Strike	Von Duprin 6300- Shim 24VDC-630	630
		ACT LEAF	
2	Door Pull	CBH CBH 7008-1 No. 1 C32D	US32D
1	Surface Closer	LCN 4021 REGARM 689 57	689
		INACT LEAF	
1	Mounting Bracket	LCN 4020-18G	689
1	Electronic Closer	GYROTECH ADO GT8710 X FWH 628 NO ALTERNATE	
		ACT LEAF	
1	Overhead Door Stop	Glynn-Johnson 104S ADJ	630
		ACT LEAF	
1	Overhead Door Stop	Glynn-Johnson 104S US32D	US32D
1	Threshold	K.N. Crowder CT-46 X 84" AL	627
2	Weatherstripping	K.N. Crowder W-24S x 42"	628
2	Miscellaneous Item	Zero 51A-180 72"	A
2	Miscellaneous Item	Schlage E.S. 679-05HM BY SCURITY CONTRACTOR	BLK
1	Miscellaneous Item	LCN 8310-802	PLA
1	Miscellaneous Hardware	UNK CARD READER/INTERCOM BY OTHERS	
1	Miscellaneous Hardware	Camden CM-160/21 INSTALL IN ADO HEADER	
2	Miscellaneous Hardware	Camden CM-60/4	
2	Miscellaneous Hardware	Camden CM-89S	
1	Miscellaneous Hardware	Camden CX-33	
1	Miscellaneous Hardware	MISC WEATHERSTRIP BY ALUM DR/FR SUPPLIER	

WEATHERSEAL BY DOOR MANUFACTURER

HARDWARE SUPPLIER SECTION 08710 TO SUPPLY & INSTALL AUTO OPERATOR.

ELECTRICAL CONTRACTOR TO PROVIDE 120VAC TO HEAD OF FRAME.
ELECTRICAL CONTRACTOR TO SUPPLY & INSTALL ALL LVW IN CONDUIT TO ALL ELECTRICAL COMPONENTS LISTED IN HARDWARE LIST. REFER TO WIRING DIAGRAM SUPPLIED BY HARDWARE SUPPLIER.

Heading #41 (Group: VEST PR ADO FG)

Item #94 1 Pair of doors 301B, VESTIBULE 301 From CORRIDOR 302 100° LHRA/RHRA

1000, 1000 x 2150 x 44 - HM DR x HM FR - -

INSTALL ADO ACT LEAF

6	Standard Hinge	Ives 5BB1HW 5 X 4.5 652	652
2	Door Pull	CBH CBH 7008-1 No. 1 C32D	US32D
2	Push Bar	Von Duprin 350-630--- 4' Bar	630
1	Surface Closer	LCN 4040XP EDA 689 44	689
1	Electronic Closer	GYROTECH ADO GT8710 X FWH 628 NO ALTERNATE	
2	Kick Plate	Canadian Builders Hdw CBH 903 200 X 950 C32D	630
2	Overhead Door Stop	Glynn-Johnson 105S	630
2	Miscellaneous Item	Zero 51A-180 72"	A
2	Miscellaneous Item	Zero 951A 72"	A
1	Miscellaneous Hardware	Camden CM-160/21 INSTALL IN ADO HEADER	
2	Miscellaneous Hardware	Camden CM-60/4	
2	Miscellaneous Hardware	Camden CM-89S	

HARDWARE SUPPLIER SECTION 08710 TO SUPPLY & INSTALL AUTO OPERATOR.

ELECTRICAL CONTRACTOR TO PROVIDE 120VAC TO HEAD OF FRAME.
ELECTRICAL CONTRACTOR TO SUPPLY & INSTALL ALL LVW IN CONDUIT TO ALL ELECTRICAL COMPONENTS LISTED IN HARDWARE LIST. REFER TO WIRING DIAGRAM SUPPLIED BY HARDWARE SUPPLIER.

Heading #42 (Group: 12 with FG)

Item #95	1 Single door 303A, CORRIDOR 302 From INFANT 303	180° LHR
Item #96	1 Single door 314A, CORRIDOR 302 To PRE-SCHOOL 314	90° LH
Item #97	1 Single door 317A, CORRIDOR 302 To PRE-SCHOOL 317	90° RH
Item #98	1 Single door 319A, CORRIDOR 302 To TODDLER 319	90° LH
Item #99	1 Single door 323A, CORRIDOR 302 To TODDLER 323	90° RH

950 x 2150 x 44 - WD DR x HM FR - -

15	Standard Hinge	Ives 5BB1 4 1/2" x 4" 626	626
5	Lockset	Schlage ND78 P6 RHO 626 CMK GMK	626
5	Kick Plate	Canadian Builders Hdw CBH 903 200 X 900 C32D	630
5	Wall Door Stop	Ives WS401/402CVX US26D	US26D
5	Miscellaneous Item	Zero 51A-180 72"	A
5	Miscellaneous Item	Zero 951A 72"	A

Heading #43 (Group: EXT SGL NL ADO FG)

Item #100	1 Single door 304A, EXTERIOR From VESTIBULE 304	100° LHR
Item #101	1 Single door 316A, EXTERIOR From VESTIBULE 316	100° LHR
Item #102	1 Single door 321A, EXTERIOR From VESTIBULE 321	100° LHR

950 x 2150 x 57 - AL DR x AL FR - -

3	Continuous Hinge	Ives 112XY-83" US28	US28
3	Exit Device	Von Duprin 35A-NL-OP US26D LHR 950	626/626
3	Cylinder	Schlage PRIMUS CORE 20-740 FP KWY FILE #1212	626
3	Cylinder	Schlage RIM 20-057-ICX	626
3	Electric Strike	Von Duprin 6300- Shim 24VDC-630	630
3	Door Pull	CBH CBH 7008-1 No. 1 C32D	US32D
3	Electronic Closer	GYROTECH ADO GT8710 X FWH 628 NO ALTERNATE	
3	Overhead Door Stop	Glynn-Johnson 104S US32D	US32D
3	Threshold	K.N. Crowder CT-46 X 48 AL	
3	Weatherstripping	K.N. Crowder W-24S x 38"	628
3	Miscellaneous Item	Zero 51A-180 72"	A
3	Miscellaneous Item	Schlage E.S. 679-05HM BY SCURITY CONTRACTOR	BLK
3	Miscellaneous Hardware	Camden CM-160/21 INSTALL IN ADO HEADER	
6	Miscellaneous Hardware	Camden CM-60/4	
6	Miscellaneous Hardware	Camden CM-89S	
3	Miscellaneous Hardware	Camden CX-33	
3	Miscellaneous Hardware	MISC WEATHERSTRIP BY ALUM DR/FR SUPPLIER	

HARDWARE SUPPLIER SECTION 08710 TO SUPPLY & INSTALL AUTO OPERATOR.

ELECTRICAL CONTRACTOR TO PROVIDE 120VAC TO HEAD OF FRAME.
ELECTRICAL CONTRACTOR TO SUPPLY & INSTALL ALL LVW IN CONDUIT TO ALL ELECTRICAL COMPONENTS LISTED IN HARDWARE LIST. REFER TO WIRING DIAGRAM SUPPLIED BY HARDWARE SUPPLIER.

Heading #44 (Group: VEST SGL ADO FG)

Item #103	1 Single door 304B, VESTIBULE 304 From INFANT 303	90° RHR
Item #104	1 Single door 314B, VESTIBULE 316 From PRE-SCHOOL 314	90° RHR
Item #105	1 Single door 317B, VESTIBULE 316 From PRE-SCHOOL 317	90° LHR
Item #106	1 Single door 319B, VESTIBULE 321 From TODDLER 319	90° RHR
Item #107	1 Single door 323B, VESTIBULE 321 From TODDLER 323	90° LHR

950 x 2150 x 44 - HM DR x HM FR - -

15	Standard Hinge	Ives 5BB1HW 4 1/2" x 4 1/2" 626	626
5	Door Pull	CBH CBH 7008-1 No. 1 C32D	US32D
2	Push Bar	Von Duprin 350-630-LHR-950- 4' Bar	630
3	Push Bar	Von Duprin 350-630-RHR-950- 4' Bar	630
5	Electronic Closer	GYROTECH ADO GT8710 X FWH 628 NO ALTERNATE	
5	Kick Plate	Canadian Builders Hdw CBH 903 200 X 900 C32D	630
5	Wall Door Stop	Ives WS401CCV	626
5	Miscellaneous Item	Zero 51A-180 72"	A
5	Miscellaneous Item	Zero 951A 72"	A
5	Miscellaneous Hardware	Camden CM-160/21 INSTALL IN ADO HEADER	
10	Miscellaneous Hardware	Camden CM-60/4	
10	Miscellaneous Hardware	Camden CM-89S	
5	Miscellaneous Hardware	MISC WIRING DIAGRAM	

HARDWARE SUPPLIER SECTION 08710 TO SUPPLY & INSTALL AUTO OPERATOR.

ELECTRICAL CONTRACTOR TO PROVIDE 120VAC TO HEAD OF FRAME.
ELECTRICAL CONTRACTOR TO SUPPLY & INSTALL ALL LVW IN CONDUIT TO ALL ELECTRICAL COMPONENTS LISTED IN HARDWARE LIST. REFER TO WIRING DIAGRAM SUPPLIED BY HARDWARE SUPPLIER.

Heading #45 (Group: 50)

Item #108 — 1 Single door 305A, INFANT 303 To SLEEPING AREA 305 — 90° LH

950 x 2150 x 44 - WD DR x HM FR - -

3	Standard Hinge	Ives 5BB1 4 1/2" x 4" 626	626
1	Latchset	Schlage ND10S RHO	626
1	Kick Plate	Canadian Builders Hdw CBH 903 200 X 900 C32D	630
1	Wall Door Stop	Ives WS401CCV	626
1	Weatherstripping	K.N. Crowder W-13S X 1X 42", 2 X 84"	628
1	Weatherstripping	K.N. Crowder W-24S x 38"	628
1	Miscellaneous Item	Zero 51A-180 72"	A
1	Miscellaneous Item	Zero 951A 72"	A

Heading #46 (Group: 49)

Item #109 — 1 Single door 306A, INFANT 303 To WASHROOM 306 — 90° LH

950 x 2150 x 44 - WD DR x HM FR - -

3	Standard Hinge	Ives 5BB1 4 1/2" x 4" 626	626
1	Latchset	Schlage ND10S RHO	626
1	Kick Plate	Canadian Builders Hdw CBH 903 200 X 900 C32D	630
1	Wall Door Stop	Ives WS401/402CVX US26D	US26D
1	Miscellaneous Item	Zero 51A-180 72"	A
1	Miscellaneous Item	Zero 951A 72"	A

Heading #47 (Group: 09)

Item #110	1 Single door 309A, CORRIDOR 302 To CUST./MECH. 309	90° RH
Item #111	1 Single door 216A, CORRIDOR 219 To CUST. 216	90° LH

950 x 2150 x 44 - HM DR x HM FR - -

6	Standard Hinge	Ives 5BB1 4 1/2" x 4" 626	626
2	Lockset	Schlage ND80 P6 RHO 626 CMK GMK	626
2	Surface Closer	LCN 1461 REG DEL	689
2	Kick Plate	Canadian Builders Hdw CBH 903 200 X 900 C32D	630
2	Wall Door Stop	Ives WS401/402CVX US26D	US26D

Heading #48 (Group: 16)

Item #112	1 Single door 310A, CORRIDOR 302 To LAUNDRY 310	90° RH

950 x 2150 x 44 - HM DR x HM FR - -

3	Standard Hinge	Ives 5BB1 4 1/2" x 4" 626	626
1	Lockset	Schlage ND70P6D RHO CMK GMK	626
1	Surface Closer	LCN 4040XP DEL REG	689
1	Kick Plate	Canadian Builders Hdw CBH 903 200 X 900 C32D	630
1	Wall Door Stop	Ives WS401/402CVX US26D	US26D

Heading #49 (Group: 20)

Item #113 — 1 Single door 311A, CORRIDOR 302 To BARRIER-FREE WR 311 — 90° LH

950 x 2150 x 44 - WD DR x HM FR - -

3	Standard Hinge	Ives 5BB1HW 4 1/2" x 4 1/2" 626	626
1	Lockset	Schlage ND80 P6 RHO 626 CMK GMK	626
1	Electric Strike	Von Duprin 6211- FS-630	630
1	Electronic Closer	GYROTECH ADO GT8710 X FWH PULL SIDE 628 NO	
1	Kick Plate	Canadian Builders Hdw CBH 903 300 X 900 C32D	630
1	Wall Door Stop	Ives WS401/402CVX US26D	US26D
1	Miscellaneous Hardware	Camden CX-WC13AXFM-PS	
1	Miscellaneous Hardware	Camden CX-WEC10K2	
1	Miscellaneous Hardware	MISC WIRING DIAGRAM	

HARDWARE SUPPLIER SECTION 08710 TO SUPPLY & INSTALL AUTO OPERATOR.

ELECTRICAL CONTRACTOR TO PROVIDE 120VAC TO HEAD OF FRAME.
ELECTRICAL CONTRACTOR TO SUPPLY & INSTALL ALL LVW IN CONDUIT TO ALL ELECTRICAL COMPONENTS LISTED IN HARDWARE LIST. REFER TO WIRING DIAGRAM SUPPLIED BY HARDWARE SUPPLIER.

Heading #50 (Group: 14)

Item #114 — 1 Single door 312A, CORRIDOR 302 To KITCHEN 312 — 90° RH

Item #115 — 1 Single door 312B, CORRIDOR 302 To KITCHEN 312 — 90° LH

950 x 2150 x 44 - HM DR x HM FR - -

6	Standard Hinge	Ives 5BB1 4 1/2" x 4" 626	626
2	Lockset	Schlage ND70P6D RHO CMK GMK	626
2	Surface Closer	LCN 1461 DEL REG	689
2	Kick Plate	Canadian Builders Hdw CBH 903 200 X 900 C32D	630
2	Wall Door Stop	Ives WS401CCV	626
2	Gasketing	K.N. Crowder W-22 X18'	BLK

Heading #51 (Group: 61)

Item #116	1 Single door 313A, CORRIDOR 302 To STAFF ROOM 313		90° RH
	950 x 2150 x 44 - WD DR x HM FR - -		
3	Standard Hinge	Ives 5BB1HW 4 1/2" x 4 1/2" 626	626
1	Lockset	Schlage ND78 P6 RHO 626 CMK GMK	626
1	Surface Closer	LCN 1461 REGARM 689 44	689
1	Kick Plate	Canadian Builders Hdw CBH 903 200 X 900 C32D	630
1	Wall Door Stop	Ives WS401/402CVX US26D	US26D
1	Weatherstripping	K.N. Crowder W-24S x 42"	628
1	Gasketing	K.N. Crowder W-22 X18'	BLK

Heading #52 (Group: 49 with FG)

Item #117	1 Single door 315A, PRE-SCHOOL 314 To WASHROOM 315		90° RH
Item #118	1 Single door 318A, PRE-SCHOOL 317 To WASHROOM 318		90° RH
Item #119	1 Single door 320A, TODDLER 319 To WASHROOM 320		90° RH
Item #120	1 Single door 324A, TODDLER 323 To WASHROOM 324		90° LH
	950 x 1200 x 44 - WD DR x HM FR - -		
8	Standard Hinge	Ives 5BB1 4 1/2" x 4" 626	626
1	Latchset	Yale AU 4601LN LH 626	626
3	Latchset	Yale AU 4601LN RH 626	626
4	Kick Plate	Canadian Builders Hdw CBH 903 200 X 900 C32D	630
4	Wall Door Stop	Ives WS401/402CVX US26D	US26D
4	Miscellaneous Item	Zero 51A-180 48"	A
4	Miscellaneous Item	Zero 951A 48"	A

Heading #53 (Group: 6 with FG)

Item #121	1 Single door 322A, TODDLER 319 To STORAGE 322	90° LH
Item #122	1 Single door 322B, TODDLER 319 To STORAGE 322	90° RH

950 x 2150 x 44 - WD DR x HM FR - -

6	Standard Hinge	Ives 5BB1 4 1/2" x 4" 626	626
2	Lockset	Schlage ND80 P6 RHO 626 CMK GMK	626
2	Kick Plate	Canadian Builders Hdw CBH 903 200 X 900 C32D	630
2	Wall Door Stop	Ives WS401/402CVX US26D	US26D
2	Miscellaneous Item	Zero 51A-180 72"	A
2	Miscellaneous Item	Zero 951A 72"	A

Heading #54 (Group: EXT STORAGE 1000)

Item #123	1 Single door 325A, EXTERIOR From CHILDCARE STORAGE 325	100° LHR

1000 x 2150 x 44 - HM DR x HM FR - -

3	Standard Hinge	Ives 5BB1HW 5 X 4.5 NRP 630	630
1	Lockset	Schlage L9480T LLL 06B 626 LHR 09-544 L283-150	626
1	Cylinder	Schlage PRIMUS CORE 20-740 FP KWY FILE #1212	626
1	Door Pull	Canadian Builders Hdw CBH 350	630
		MOUNT EXTERIOR	
1	Surface Closer	LCN 4040XP SHCUSH	689
1	Kick Plate	Canadian Builders Hdw CBH 903 200 X 950 C32D	630
1	Threshold	K.N. Crowder CT-46A x 48"	
1	Weatherstripping	K.N. Crowder W-20S(HEAD) X 48"	628
1	Weatherstripping	K.N. Crowder W-24S-CA x 48"	CA
2	Weatherstripping	K.N. Crowder W-50S-CAx84" Opening	CA
1	Miscellaneous Item	Schlage E.S. 679-05HM BY SCURITY CONTRACTOR	BLK

Heading #55 (Group: 27-D)

Item #124 — 1 Pair of doors 101A, EXTERIOR From VESTIBULE 101 — 100° LHRA/RHRA

1000, 1000 x 2150 x 57 - AL DR x AL FR - -

2	Continuous Hinge	Ives 112XY-83" US28	US28
1	Removable Mullion	Von Duprin KR4854-2150"-{BLANK}-689	689
1	Exit Device	Von Duprin 35A-EO-626- x 2150 Door 57-	626
1	Exit Device	Von Duprin 35A-NL-OP US26D	626/626
		LHR LEAF	
1	Cylinder	Schlage MORT 20-001 CMK GMK	626
1	Cylinder	Schlage PRIMUS CORE 20-740 FP KWY FILE #1212	626
1	Cylinder	Schlage RIM 20-057-ICX	626
1	Electric Strike	Von Duprin 6300- Shim 24VDC-630	630
		ACT LEAF LHR	
2	Door Pull	CBH CBH 7008-1 No. 1 C32D	US32D
1	Surface Closer	LCN 4021 REGARM 689 57	689
1	Mounting Bracket	LCN 4020-18G	689
1	Electronic Closer	GYROTECH ADO GT8710 X FWH 628 NO ALTERNATE	
		ACT LEAF LHR	
1	Overhead Door Stop	Glynn-Johnson 104S ADJ	630
		LHR LEAF	
1	Overhead Door Stop	Glynn-Johnson 104S US32D	US32D
		RHR LEAF	
2	Threshold	K.N. Crowder CT-46 X 48 AL	
2	Weatherstripping	K.N. Crowder W-24S x 42"	628
2	Miscellaneous Item	Schlage E.S. 679-05HM BY SCURITY CONTRACTOR	BLK
1	Miscellaneous Item	LCN 8310-802	PLA
1	Miscellaneous Hardware	UNK CARD READER/INTERCOM BY OTHERS	
2	Miscellaneous Hardware	Camden CM-60/4	
2	Miscellaneous Hardware	Camden CM-89S	
1	Miscellaneous Hardware	Camden CX-33	
1	Miscellaneous Hardware	MISC WEATHERSTRIP BY ALUM DR/FR SUPPLIER	

WEATHERSEAL BY DOOR MANUFACTURER

HARDWARE SUPPLIER SECTION 08710 TO SUPPLY & INSTALL AUTO OPERATOR.

ELECTRICAL CONTRACTOR TO PROVIDE 120VAC TO HEAD OF FRAME.
ELECTRICAL CONTRACTOR TO SUPPLY & INSTALL ALL LVW IN CONDUIT TO ALL ELECTRICAL COMPONENTS LISTED IN HARDWARE LIST. REFER TO WIRING DIAGRAM SUPPLIED BY HARDWARE SUPPLIER.

Heading #56 (Group: 32-T-D)

Item #125 — 1 Pair of doors 101B, VESTIBULE 101 From STUDENT FORUM 102 — 100° LHRA/RHRA

1000, 1000 x 2150 x 45 - AL DR x AL FR - -

INSTALL ADO ACT LEAF

2	Continuous Hinge	Ives 112XY-83" US28	US28
1	Removable Mullion	Von Duprin KR4854-2150"-{BLANK}-689	689
1	Cylinder	Schlage MORT 20-001 CMK GMK	626
2	Door Pull	CBH CBH 7008-1 No. 1 C32D	US32D
2	Push Bar	Von Duprin 350-630--- 4' Bar	630
1	Surface Closer	LCN 4021 REGARM 689 45	689
1	Mounting Bracket	LCN 4020-18G	689
1	Electronic Closer	GYROTECH ADO GT8710 X FWH 628 NO ALTERNATE	
1	Overhead Door Stop	Glynn-Johnson 104S ADJ	630
1	Overhead Door Stop	Glynn-Johnson 104S US32D	US32D
1	Miscellaneous Hardware	Camden CM-160/21 INSTALL IN ADO HEADER	
2	Miscellaneous Hardware	Camden CM-60/4	
2	Miscellaneous Hardware	Camden CM-89S	

HARDWARE SUPPLIER SECTION 08710 TO SUPPLY & INSTALL AUTO OPERATOR.

ELECTRICAL CONTRACTOR TO PROVIDE 120VAC TO HEAD OF FRAME.
ELECTRICAL CONTRACTOR TO SUPPLY & INSTALL ALL LVW IN CONDUIT TO ALL ELECTRICAL COMPONENTS LISTED IN HARDWARE LIST. REFER TO WIRING DIAGRAM SUPPLIED BY HARDWARE SUPPLIER.

Heading #57 (Group: 42)

Item #126 — 1 Pair of doors 201A, STAIR C 201 From CORRIDOR 219 — 100° LHRA

1000, 1000 x 2150 x 44 - HM DR x HM FR - 45MIN

6	Standard Hinge	Ives 5BB1HW 5X 4.5 NRP 652	652
2	Exit Device	Von Duprin 98-L-F -06 4' US26D	626/626
2	Cylinder	Schlage RIM 20-021 CMK GMK	626
1	Surface Closer	LCN 4040XP EDA 689 44	689
2	Kick Plate	Canadian Builders Hdw CBH 903 200 X 950 C32D	630
2	Electro-Magnetic Holder	LCN SEM 7810- 689 X SEM7810- E200	689
2	Electro-Magnetic Holder	LCN SEM 7850 689	689
2	Weatherstripping	K.N. Crowder W-24S x 42"	628
2	Gasketing	K.N. Crowder W-22 X18'	BLK
1	Miscellaneous Item	UNK FIXED MULLION BY FRAME SUPPLIER	

ELECTRICAL CONTRACTOR TO INTERFACE EMHO WITH F/A PANEL.
WALL MTD ON RHR LEAF
HEADER MTD ON LHR LEAF

Heading #58 (Group: 41)

Item #127 — 1 Single door 206A, CORRIDOR 203 To MECHANICAL ROOM 206 — 100° LH

Item #128 — 1 Single door 206B, CORRIDOR 203 To MECHANICAL ROOM 206 — 90° RH

950 x 2150 x 44 - HM DR x HM FR - 45MIN

6	Standard Hinge	Ives 5BB1 4 1/2" x 4" 626	626
2	Lockset	Schlage ND80 P6 RHO 626 CMK GMK	626
2	Surface Closer	LCN 1461 REGARM 689 44	689
2	Kick Plate	Canadian Builders Hdw CBH 903 200 X 900 C32D	630
2	Wall Door Stop	Ives WS401/402CVX US26D	US26D
2	Gasketing	K.N. Crowder CT-54 W/SHIM X 42"	627
2	Gasketing	K.N. Crowder W-22 X18'	BLK

Heading #59 (Group: VEST PR ULC EMHO)

Item #129	1 Pair of doors 209A, STAIR A 209 From CORRIDOR 203	180°,100° LHRA
Item #130	1 Pair of doors 227A, STAIR B 227 From CORRIDOR 219	180°,100° LHRA

1000, 1000 x 2150 x 44 - HM DR x HM FR - 45MIN

12	Standard Hinge	Ives 5BB1HW 5X 4.5 NRP 652	652
4	Exit Device	Von Duprin 98-L-F -06 4' US26D	626/626
4	Cylinder	Schlage RIM 20-021 CMK GMK	626
4	Surface Closer	LCN 4040XP EDA 689 44	689
4	Kick Plate	Canadian Builders Hdw CBH 903 200 X 950 C32D	630
4	Electro-Magnetic Holder	LCN SEM 7810- 689 X SEM7810- E200	689
4	Electro-Magnetic Holder	LCN SEM 7850 689	689
4	Weatherstripping	K.N. Crowder W-24S-CA x 48"	CA
4	Gasketing	K.N. Crowder W-22 X18'	BLK
2	Miscellaneous Item	UNK FIXED MULLION BY FRAME SUPPLIER	

ELECTRICAL CONTRACTOR TO INTERFACE EMHO WITH F/A PANEL.

Heading #60 (Group: STORAGE CL WS)

Item #131	1 Single door 215A, CORRIDOR 219 To IT 215	90° RH

950 x 2150 x 44 - HM DR x HM FR - -

3	Standard Hinge	Ives 5BB1 4 1/2" x 4" 626	626
1	Lockset	Schlage ND80 P6 RHO 626 CMK GMK	626
1	Surface Closer	LCN 1461 REGARM 689 44	689
1	Kick Plate	Canadian Builders Hdw CBH 903 200 X 900 C32D	630
1	Wall Door Stop	Ives WS401CCV	626

Heading #61 (Group: WR CORR)

Item #132	1 Single door 217A, CORRIDOR 219 To BARRIER-FREE WR 217	90° RH
Item #133	1 Single door 218A, CORRIDOR 219 To WASHROOM 218	90° LH

950 x 2150 x 44 - HM DR x HM FR - -

6	Standard Hinge	Ives 5BB1 4 1/2" x 4" 626	626
1	Lockset	Schlage L9496 P6 06 626 LH CMK GMK	626
1	Lockset	Schlage L9496 P6 06 626 RH CMK GMK	626
2	Kick Plate	Canadian Builders Hdw CBH 903 300 X 900 C32D	630
2	Overhead Door Stop	Glynn-Johnson 904S US32D	US32D

Heading #62 (Group: CLASS RM OHS)

Item #134	1 Single door 221B, CLASSROOM 9 221 FROM SEMINAR 5 222	90° LHR
Item #135	1 Single door 223B, CLASSROOM 10 223 FROM SEMINAR 5 222	90° RHR
Item #136	1 Single door 233B, CLASSROOM 17 233 FROM SEMINAR 6 234	90° LHR
Item #137	1 Single door 235B, CLASSROOM 18 235 FROM SEMINAR 6 234	90° RHR

950 x 2150 x 44 - WD DR x HM FR - -

12	Standard Hinge	Ives 5BB1 4 1/2" x 4" 626	626
4	Lockset	Schlage ND70P6D RHO CMK GMK	626
4	Kick Plate	Canadian Builders Hdw CBH 903 200 X 900 C32D	630
4	Overhead Door Stop	Glynn-Johnson 904S US32D	US32D

Heading #63 (Group: 03)

Item #138	1 Single door 228A, CORRIDOR 219 To ACAD STORAGE 228	90° LH

950 x 2150 x 44 - WD DR x HM FR - -

3	Standard Hinge	Ives 5BB1 4 1/2" x 4" 626	626
1	Lockset	Schlage ND80 P6 RHO 626 CMK GMK	626
1	Surface Closer	LCN 1461 REG DEL	689
1	Kick Plate	Canadian Builders Hdw CBH 903 200 X 900 C32D	630
1	Wall Door Stop	Ives WS401/402CVX US26D	US26D

Heading #64 (Group: 06)

Item #139	1 Single door 240A, ART 239 To STORAGE 240	90° LH
Item #140	1 Single door 241A, MUSIC 242 To STORAGE 241	90° LH

950 x 2150 x 44 - HM DR x HM FR - -

6	Standard Hinge	Ives 5BB1 4 1/2" x 4" 626	626
2	Lockset	Schlage ND80 P6 RHO 626 CMK GMK	626
2	Kick Plate	Canadian Builders Hdw CBH 903 200 X 900 C32D	630
2	Wall Door Stop	Ives WS401/402CVX US26D	US26D

Heading #65 (Group: CLASS WS SS)

Item #141	1 Single door 242A, CORRIDOR 219 To MUSIC 242	90° LH

950 x 2150 x 44 - WD DR x HM FR - -

3	Standard Hinge	Ives 5BB1 4 1/2" x 4" 626	626
1	Lockset	Schlage ND78 P6 RHO 626 CMK GMK	626
1	Kick Plate	Canadian Builders Hdw CBH 903 200 X 900 C32D	630
1	Wall Door Stop	Ives WS401CCV	626
1	Weatherstripping	K.N. Crowder W-13S X 1X 42", 2 X 84"	628
1	Weatherstripping	K.N. Crowder W-24S x 38"	628

Heading #66 (Group: ROOF)

Item #142 — 1 Single door 243A, MECH. MEZZANINE 243 0 0 — 100° RHR

950 x 2150 x 44 - HM DR x HM FR - -

3	Standard Hinge	Ives 5BB1HW 4 1/2" x 4 1/2" 626	626
1	Lockset	Schlage ND82 P6 RHO 626 CMK GMK	626
1	Surface Closer	LCN 4040XP SHCUSH	689
1	Kick Plate	Canadian Builders Hdw CBH 903 200 X 900 C32D	630
1	Threshold	K.N. Crowder CT-46A x 48"	
1	Weatherstripping	K.N. Crowder W-20S-CA x 38"	CA
1	Weatherstripping	K.N. Crowder W-24S x 38"	628
2	Weatherstripping	K.N. Crowder W-50S-CAx84" Opening	CA
1	Miscellaneous Item	Schlage E.S. 679-05HM BY SCURITY CONTRACTOR	BLK

Heading #67 (Group: STORAGE CUSH)

Item #143 — 1 Single door 244A, CORRIDOR 203 From STORAGE 244 — 90° RHR

950 x 2150 x 44 - HM DR x HM FR - -

3	Standard Hinge	Ives 5BB1 4 1/2" x 4" 626	626
1	Lockset	Schlage ND80 P6 RHO 626 CMK GMK	626
1	Surface Closer	LCN 1461 SCUSH 689 44	689
1	Kick Plate	Canadian Builders Hdw CBH 903 200 X 900 C32D	630

Heading #68 (Group: 62-TC CLOSETS)

Item #144 1 Elevation TC-CLOSET

__ x __ x __ - WD TC CLSET DR x WD FR

9-CHILDCARE
8-GROUND FLOOR
21-SECOND FLOOR

38	Miscellaneous Hardware	Schlage CL100PB Open CMK GMK 626	626

BALANCE OF HARDWARE BY MILLWORK

Heading #69 (Group: 63-MISC)

Item #145 1 Elevation MISC

__ x __ x __ - NO DR x NO FR

1		Telkee AWC-150-S	
2	Miscellaneous Item	Schlage CONTROL KEY 48-056	468
6	Miscellaneous Item	Schlage CUT KEY 48-104	468
3	Miscellaneous Item	Schlage EXTRACTOR 35-057	
5	Miscellaneous Item	Schlage MK KEY 49-101	468
3	Miscellaneous Item	Schlage OPERATING KEY 48-101-ICX	468
3	Miscellaneous Item	Schlage PRIMUS MK KEY 49-157	468
2	Miscellaneous Item	Schlage PRIMUS MK KEY 49-158	468

CX-33: ADVANCED LOGIC RELAY

CX-33 is a 'state of the art' door controller designed for 'universal' operation in automatic door and application security. This compact unit is small enough to fit inside most door operator cases. It provides a large 3 segment LED and simple push buttons for the easiest programming, and supports illuminated signage in restroom applications. It also leads the market with a range of exclusive operating features, including time duration in airlock applications and protection of automatic door operators when utilizing magnetic locks.



Features

- 15 operating modes with sub-modes
- Easily sequence multiple inputs with multiple maintain and hold outputs
- New V3.2 Features Include:
  - Lock down mode
  - Delayed relay activation
  - Selectable N.O or N.C. inputs
- Large 3 segment (blue) LED display
- Outstanding power filtering and surge protection
- Selectable time delays with delay on input activation
- Larger terminal strips
- 12V to 24V AC/DC
- 3 year warranty

MODEL	
CX-33	Advanced Logic Relay

Specifications

Voltage:	12V to 24V AC/DC
Current Draw:	105mA Typical, 320mA Max
Response Time:	0.5 Seconds
Display:	Blue Multi-Segment LED
Input:	4 x Dry 1 x Wet: min. 5V AC/DC N/O or N/C Selectable
Output:	3 x Form C (SPDT)
Contact Rating:	3A @ 30 VDC
Temp Range:	-22°F to +185°F (-30°C to +85°C)
Time Delay:	Hold 1 timer: 0-50 Seconds Delay 1 Timer: 0-15 Seconds Hold 2 timer: 0-50 Seconds Delay 2 timer: 0-60 Seconds Hold 3 Timer: 0-50 Seconds Delay on Activate: 0-10 Seconds
Dimensions:	2"H x 6"W x 7/8"D (51mm x 152mm x 22mm)

CX-33PS: ADVANCED LOGIC RELAY, POWER SUPPLY AND CABINET

*The industry leading **CX-33** Advanced Logic Relay is available in a metal cabinet that centralizes all door and security control system components; a 12/24 VDC power supply module, and color coded termination blocks for quick and easy installation.*



Features

- Rugged and compact metal cabinet
- Pre-wired with large terminal block for easy access
- Removable door with option for cabinet lock
- Five convenient conduit knockouts; one per side
- 12/24V DC power supply, 2 Amp. (UL listed)
- Available as part of Camden Restroom Control Kits (See pages 36-37)
- Short circuit and thermal overload protection
- 3 year warranty

MODEL	
CX-33PS	Advanced Logic Relay, 2 Amp Power Supply, Cabinet and Transformer
Option	
'L'	Add suffix '**L**' to model number for Cabinet Lock

Specifications

Voltage:	12V to 28V AC/DC
Output:	12V or 24 VDC
Current:	2 Amps
Temp Range:	32°F to +120°F (0°C to +49°C)
Dimensions:	11-1/16" H x 7-7/8"W x 2-13/16"D 281mm x 200mm x 72mm)

CDH
Commercial Doors & Hardware Ltd.
2150 Winston Park Drive, Unit 16
Oakville, L6H 5V1

NORTH OAKVILLE #3 HCDSB

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CX-WC: BARRIER FREE RESTROOM CONTROL KITS

Listed Components

ADA Compliant

MODELS	
CX-WC13AXSM-PS	**SURFACE MOUNT COMBO ILLUMINATED PUSH PLATE SYSTEM** (1) **CX-33PS** Advanced Logic Relay, 2 Amp Power Supply, Cabinet and Transformer (1) **CM-2520/4854SE1** Combo switch, 2" x 4" narrow 'PUSH TO OPEN' & 'PUSH TO LOCK', Surface mount AURA™ illuminated enclosure and sign (1) **CM-45/454SE1** 4-1/2" Push plate switch, wheelchair & 'PUSH TO OPEN' with Surface mount AURA™ illuminated enclosure and sign (1) **CX-ED2079** Grade 2 ANSI electric strike with 3 faceplates (1) **CX-MDA** Magnetic contact, surface, SPST, white Add suffix 'F' for French, 'FE' for bilingual, 'SP' for Spanish
CX-WC13AXFM-PS	**FLUSH MOUNT COMBO ILLUMINATED PUSH PLATE SYSTEM** (1) **CX-33PS** Advanced Logic Relay, 2 Amp Power Supply, Cabinet and Transformer (1) **CM-2520/4855SE1** Combo switch, 2" x 4" narrow 'PUSH TO OPEN' & 'PUSH TO LOCK', Flush mount AURA™ illuminated enclosure and sign (1) **CM-45/455SE1** 4-1/2" Push plate switch, wheelchair & 'PUSH TO OPEN' with Flush mount AURA™ illuminated enclosure and sign (1) **CX-ED2079** Grade 2 ANSI electric strike with 3 faceplates (1) **CX-MDA** Magnetic contact, surface, SPST, white Add suffix 'F' for French, 'FE' for bilingual, 'SP' for Spanish
CX-WC14AXSM	**SURFACE MOUNT TWO DOOR RESTROOM SYSTEM** (1) **CX-EMF2** Multi-Function Relay Controller (2) **CM-2520/4854SE1** Combo switch, 2" x 4" narrow 'PUSH TO OPEN' & 'PUSH TO LOCK', Surface mount AURA™ illuminated enclosure and sign (2) **CM-45/454SE1** 4-1/2" Push plate switch, wheelchair & 'PUSH TO OPEN' with Surface mount AURA™ illuminated enclosure and signs (2) **CX-MDA** Magnetic contact, surface, SPST, white Add suffix 'F' for French, 'FE' for bilingual, 'SP' for Spanish
CX-WC14AXFM	**FLUSH MOUNT TWO DOOR RESTROOM SYSTEM** (1) **CX-EMF2** Multi-Function Relay Controller (2) **CM-2520/4855SE1** Combo switch, 2" x 4" narrow 'PUSH TO OPEN' & 'PUSH TO LOCK', Flush mount AURA™ illuminated enclosure and sign (2) **CM-45/455SE1** 4-1/2" Push plate switch, wheelchair & 'PUSH TO OPEN' with Flush mount AURA™ illuminated enclosure and signs (2) **CX-MDA** Magnetic contact, surface, SPST, white Add suffix 'F' for French, 'FE' for bilingual, 'SP' for Spanish

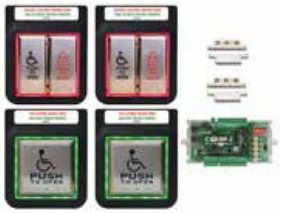


CX-WC13AXSM-PS


CX-WC13AXFM-PS



CX-WC14AXSM



CX-WC14AXFM

CDH
Commercial Doors & Hardware Ltd.
2150 Winston Park Drive, Unit 16
Oakville, L6H 5V1

NORTH OAKVILLE #3 HCDSB

KINETIC BY CAMDEN VERSIONS AVAILABLE

CM-40, CM-41 & CM-60 SERIES: ROUND PUSH PLATE SWITCHES

Listed Components

ADA Compliant

CM-40, CM-41 and CM-60 *Series 'All-Active' push plate switches are heavy-duty, ADA-compliant door controls. Faceplates are stainless steel or solid brass, and the assembly is designed for easy installation. The CM-41 4-1/2" square stainless steel backplate is large enough to cover a poorly installed electrical box. Also fits Camden 4-1/2" square surface boxes.*



CM-40/2



CM-41/3



CM-60/4

Features

- Durable stainless steel or brass construction
- 4 stud switch design and rubber dampers for quieter operation
- All-Active design requires minimal actuation force
- Weather resistant boot included
- Large variety of graphics options
- Available in a range of architectural finishes
- 3 year 'Camden Tough' warranty with '2 for 1' replacement

Specifications

Contact Rating:	15A @ 30 VDC
Contact Type:	SPDT Form 'C'
Mounting:	**CM-40/41:** Single Gang **CM-60:** Single/Double Gang or 4 x 4
Switch Type:	Momentary
Std. Finish:	US32 / 630
Dimensions:	**CM-40:** 4-1/2" Diameter x 1-3/4"D (114mm x 44mm) **CM-41:** 4-1/2"H x 4-1/2"W x 1-3/4"D (114mm x 114mm x 44mm) **CM-60:** 6" Diameter x 1-1/8"D (152mm x 28.6mm)

ROUND SWITCHES

CM-40	4-1/2" Round push plate switch, brushed stainless steel finish
CM-41	4-1/2" Round push plate switch, with square back plate, brushed stainless steel finish
CM-60	6" Round push plate switch, brushed stainless steel finish

NO-BATTERY KINETIC BY CAMDEN™ WIRELESS ROUND SWITCHES with built-in transmitter. Receiver required.

CM-40K	4-1/2" Round push plate switch, brushed stainless steel finish
CM-41K	4-1/2" Round push plate switch, with square back plate, brushed stainless steel finish
CM-60K	6" Round push plate switch, brushed stainless steel finish

OPTIONS (Add suffix to model above)

Faceplate Graphic Options



CM-xx/1 *CM-xx/2* *CM-xx/A2* *CM-xx/2AL* *CM-xx/2AR* *CM-xx/3* *CM-xx/3F* *CM-xx/4*

CM-xx/A4 *CM-xx/4AL* *CM-xx/4AR* *CM-xx/4F* *CM-xx/4FE* *CM-xx/8* *CM-xx/8B* *CM-xx/8F* *CM-xx/8D*

Architectural Finishes (Only available with /1, /2, /3, /4 graphic options)		Water Tight Option	Contact Option
CM-xx-AB Antique Brass	CM-xx-OB Oil Rub Bronze	CM-xx-WT Boot & watertight coating	CM-xx-DP DPDT switch instead of SPDT
CM-xx-SB Satin Brass	CM-xx-PB Polished Brass		

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2150 Winston Park Drive, Unit 16
Oakville, L6H 5V1

NORTH OAKVILLE #3 HCDSB

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CM-49, 59, 79 AND 89 SERIES: SURFACE AND FLUSH MOUNT ESCUTCHEONS (FOR ROUND PUSH PLATE SWITCHES)

*Camden offers a range of **flame and vandal resistant** low profile escutcheons for mounting 4-1/2" and 6" round push plate switches. ABS escutcheons feature a patented 2-piece design and may be ordered as complete 'kits' or individual parts. Stainless steel escutcheons feature one piece heavy gauge construction.*

Features	
• Exclusive 2 piece ABS escutcheons can be surface mounted or mounted on in-wall single gang, double gang or 4" square electrical boxes	• Heavy gauge stainless steel escutcheons provide an attractive, rugged look • ABS models are designed for use with Lazerpoint™ 915 MHz. wireless wall switch transmitters

FOR 4-1/2" ROUND SWITCH - STAINLESS STEEL ESCUTCHEON	
CM-59S	Surface, Round, Standard Depth. Heavy gauge stainless steel, 7-3/4" x 1-1/18"D
FOR 4-1/2" ROUND SWITCH - ABS SPACESHIP ESCUTCHEON	
CM-49	Surface/Flush Mount Kit, includes **CM-49A, CM- 49B, CM-49C & CM-49G,** 8-3/4" x 2"D
CM-49A	Flush enclosure only (fits single gang box), 7" x 13/16"D
CM-49AK	Flush Mount Kit, includes **CM-49A, CM-49C & CM-49G,** (fits single, double and 4 x 4 boxes), 7" x 13/16"D
CM-49B	Surface mount enclosure only (must be used with **CM-49A**), 8-3/4" x 1"D
CM-49C	Adapter plate for mounting on double gang or 4" Square box, 4" x 1/16"D
CM-49G	Gasket for **CM-49A** OR **CM-49B**, 6-1/4" x 1/8"D
FOR 6" ROUND SWITCH - STAINLESS STEEL ESCUTCHEON	
CM-89S	Surface, round standard depth. Heavy gauge stainless steel, 9-5/8" x 1-1/2"D
FOR 6" ROUND SWITCH - ABS SPACESHIP ESCUTCHEON	
CM-79	Surface/Flush Mount Kit, includes **CM-79A, CM-79B, CM-49C & CM-79G,** 9-5/8" x 2"D
CM-79A	Flush enclosure only (fits single gang box), 8" x 3/4"D
CM-79AK	Flush Mount Kit, includes **CM-79A, CM-49C & CM-79G,** (fits single, double and 4 x 4 boxes), 8" x 3/4"D
CM-79B	Surface mount enclosure only (must be used with **CM-79A**), 9-5/8" x 1-1/8"D
CM-79G	Gasket for **CM-79A or CM-79B**, 7-1/4" x 1/8"D



CM-59S



CM-49A *CM-49B*
(Shown with TX-9 Transmitter)



CM-89S



CM-79A *CM-79B*
(Shown with TX-9 Transmitter)

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CM-160 / 170 / 180 SERIES: KEY SWITCHES

***Key switches** for automatic doors are designed for mounting on the door operator cabinet or door frame, and are available in a range of 2 or 3 position momentary or maintained models. The key cylinder and 2 keys are included.*

Features	
• Black lamacoid (plastic) or stainless steel faceplates • Key removable in all maintained positions	• 2, 3, 4 position maintained and 2 position momentary models • All switches are keyed alike

MODELS	
CM-160	Key switch with plastic lamacoid (mini) faceplate
CM-170*	Key switch with stainless steel (narrow stile) faceplate
CM-180*	Key switch with stainless steel (single gang) faceplate

OPTIONS (Add suffix to model above)

Faceplate Graphics

MOMENTARY	MAINTAINED	MAINTAINED	MAINTAINED	MAINTAINED
OFF / OPEN	OFF / AUTO	OFF / AUTO / HOLD OPEN	DAY / OFF / NIGHT	EXIT AUTO / OFF / HOLD OPEN
CM-xx/20	*CM-xx/21*	*CM-xx/22*	*CM-xx/23*	*CM-xx/24*

Extra Keys

CM-A126	(2) Extra keys for CM-160, 170 and 180 series key switches

Faceplate includes "AUTOMATIC DOOR" text at bottom of switch (as shown in images)



CM-160/23



CM-170/21



CM-180/23

Specifications

Contact Rating: 4A @ 28 VDC

Switch Life: 100,000 cycles

Dimensions: **CM-160:** 3"H x 1-11/16"W x 1-3/8"D (76mm x 42mm x 35mm)
CM-170: 4-1/2"H x 1-3/4"W x 1-3/8"D (114mm x 44mm x 35mm)
CM-180: 4-1/2"H x 2-3/4" W x 1-3/8" D (114mm x 70mm x 35mm)

CM-190 SERIES: TOGGLE SWITCH

***CM-190 Series** maintained toggle switches are designed to control automatic door operators, featuring a choice of faceplates, for mounting on the operator cabinet/wall.*

Features	
• Mini metal faceplate designed to install on door operator cabinet or door frame • 2 or 3 position maintained operation	• Single gang faceplate for mounting on standard electrical box • Heavy duty 6 Amp. contacts

MODELS	
CM-190	Mini aluminum faceplate
CM-195*	Single gang stainless steel faceplate

OPTIONS (Add suffix to model above)

Faceplate Graphics

ON / OFF — *CM-xx/30*	AUTOMATIC / OFF OFF / HOLD OPEN — *CM-xx/31*

Faceplate includes "AUTOMATIC DOOR" text at bottom of switch (as shown in images)



CM-190/30



CM-195/31

Specifications

Contact Rating: 6A @ 30 VDC

Switch Life: 50,000 cycles

Temp Range: -4°F - 185°F (-20°C - 85°C)

Dimensions: **CM-190:** 2-5/8" H x 1-1/2" W x 2"D (59mm x 38mm x 51mm)
CM-195: 4-1/2" H x 2-3/4" W x 2"D (114mm x 70mm x 51mm)

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CX-WEC: EMERGENCY CALL SYSTEM CONTROL KITS FOR UNIVERSAL & RESTROOM APPLICATIONS

CX-WEC Series equipment packages are designed to provide a complete solution that includes assistance request and notification that meets the latest OBC building code requirements. CX-WEC Series Emergency Call System kits are available with white only or red/green/blue/white multi-color dome lights with sounder, and with system reset that support the use of momentary 'PRESS FOR ASSISTANCE' switches.

CX-WEC10: Universal Emergency Call System Kit

(1) **CM-450R/12** Mushroom push button, single gang, stainless steel faceplate, push/pull, 'PRESS FOR EMERGENCY ASSISTANCE'

(1) **CM-AF501SO** Single gang LED annunciator with adjustable sounder 'ASSISTANCE REQUESTED'

(1) **CM-AF141SO** Single gang LED dome light with adjustable sounder

(1) **CM-SE21** White panel sign, 12.5" x 8.5" (317.5mm x 216mm)

Add suffix 'F' for French, 'FE' for French/English, 'SP' for Spanish



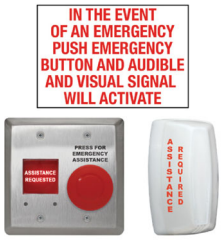
CX-WEC10K2: Universal Emergency Call System Kit

(1) **CM-AF540SO** Double gang, push/pull mushroom push button, red, 'Assistance Required', with LED annunciator & adjustable sounder, 'Assistance Requested'

(1) **CM-AF141SO** Single gang LED dome light with adjustable sounder

(1) **CM-SE21** White panel sign, 12.5" x 8.5" (317.5mm x 216mm)

Add suffix 'F' for French, 'FE' for French/English, 'SP' for Spanish



CX-WEC10BK2: Universal Emergency Call System Kit with Multi-Color LED Dome Light

(1) **CM-AF540SO** 'PRESS FOR EMERGENCY ASSISTANCE' maintained mushroom push button & 'ASSISTANCE REQUESTED' LED annunciator with adjustable sounder

(1) **CM-SE21** White panel sign, 12.5" x 8.5" (317.5mm x 216mm)

(1) **CM-AF142SO** Single gang multi-volor LED dome light with adjustable sounder and flashing LED

Add suffix 'F' for French, 'FE' for French/English, 'SP' for Spanish



CX-WEC10CK2: Emergency Call System Kit 2 Door Restrooms Multi-Color Dome Light

(1) **CM-AF540SO** 'PRESS FOR EMERGENCY ASSISTANCE' maintained mushroom push button & 'ASSISTANCE REQUESTED' LED annunciator with adjustable sounder

(2) **CM-AF142SO** Single gang multi-color LED dome light with adjustable sounder and flashing LED

(1) **CM-SE21** White panel sign, 12.5" x 8.5" (317.5mm x 216mm)

Add suffix 'F' for French, 'FE' for French/English, 'SP' for Spanish



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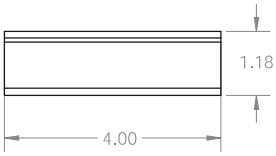
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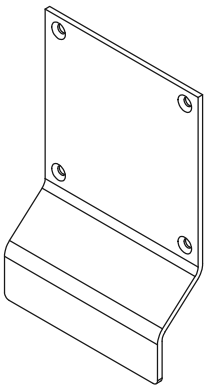
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CBH 353

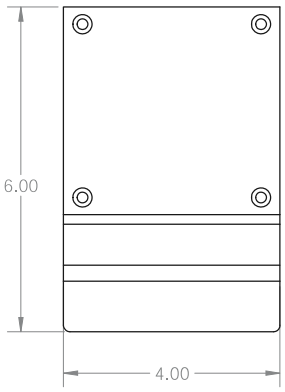
MATERIAL:
BRASS, BRONZE AND STAINLESS STEEL (.125")

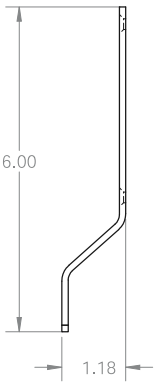
FINISHES: ALL STANDARD











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All dimensions are in inches. Product specifications are subject to change. For the most updated product features, contact our customer service department.

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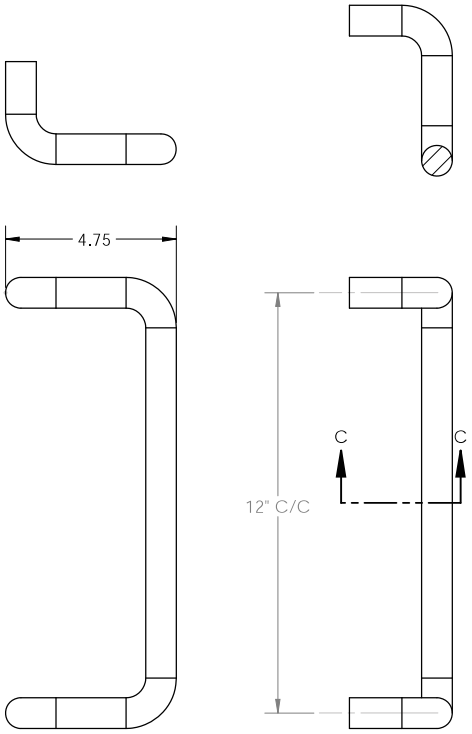
CBH 7008/7008-1/7009/7009-1/7238/7239

MATERIAL:
3/4" BRASS, BRONZE, AND STAINLESS STEEL, 7/8" ALUMINUM, 1" BRASS, BRONZE, AND STAINLESS STEEL

FINISHES: ALL STANDARD

MOUNTING: 1, 3 OR 6.
#1 MTG 5⁄16–18 NC
#3 MTG 5⁄16–18 NC
#6 MTG 3⁄8–16 NC





SKUS:
CBH 7108/7108-1 -12" PULL 45°
CBH 7109/7109-1 -12" PULL 90°
CBH 7238 - 9" PULL 45°
CBH 7239 - 9" PULL 90°

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90 Series surface overhead door holders/stops



90 Series heavy-duty

Glynn-Johnson 90 Series holders and stops are the most rugged models available for heavy-duty applications. The channel is thru-bolted to the door with sex bolts, and the jamb bracket is surface mounted to the jamb, requiring minimal door and frame preparation.

These versatile units can be used in conjunction with most surface-applied door closers. The provided templates allow for variable mounting positions, ranging from 85° to 110° hold-open/stop angle. These templates are designed for installation in almost all types of doors, including doors with conventional butt-type hinges or specialty hinges.

Four models:

- 90H Series hold-open model
- 90S Series stop-only model
- 90F Series friction hold-open model
- 90SE Series special stop-only model

Five sizes:

- Simple
- Standardized
- Each model is available in five sizes

Three options:

- J—Angle jamb bracket
- SHIM—Blade stop shim kits
- SOC—Pin-in-socket security screw package

Unmatched convenience:

- Non-handed
- Improved compatibility with door closers
- Single-acting doors
- Interior/exterior applications
- Durable
- Easy to install
- Improved corrosion resistance
- Function conversion kits available

Materials and finishes

In 300 Series stainless steel, brass and steel substrates, these models are available in the largest selection of finishes in the industry. Stainless steel models offer the highest resistance to corrosion. Available in the following finishes:

BHMA	US	Finish description
605	US3	Polished Brass
606	US4	Satin Brass
612	US10	Satin Bronze
613	US10B	Oil Rubbed Bronze
619	US15	Satin Nickel
625	US26	Polished Chrome
643E/716	–	Aged Bronze, Blackened, Edge Relieved
652	–	Satin Chrome
706	SP4	Powder Coat Brass
691	SP10	Powder Coat Bronze
689	SP28	Powder Coat Aluminum
695	SP313	Powder Coat Dark Bronze
622	SPBLK	Powder Coat Black

Models

Glynn-Johnson 90 Series door holders and stops provide long-lasting protection for doors, frames and hardware. All models incorporate a heavy-duty channel/slide-arm design and offset jamb bracket. This unique design allows for simple field modification of functions, should user requirements change.

90H Series hold-open

(Suffix H) Hold-open models provide a convenient method of holding the door open at a predetermined position for short or long periods of time, permitting an unobstructed traffic flow through the opening. The hold-open function can easily be turned on or off by simply rotating the serrated knob on the bottom of the channel. This knob engages the hold-open mechanism, allowing the door to be held open at a predetermined position ranging from 85° to 110°. When the knob is flipped over, it acts as a stop and shock absorber.

The tension on the hold-open mechanism can be adjusted using a phillips screwdriver to offset air currents or other exterior conditions. The hold-open tension adjustment is located on the top of the slider in the channel.

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100 Series concealed overhead door holders/stops



100 Series heavy-duty

Glynn-Johnson offers a complete line of overhead door holders and stops, accommodating virtually all openings with solutions for even the most complex door control problems. These concealed holders and stops provide the most attractive and reliable heavy-duty door control available.

Glynn-Johnson 100 Series holders and stops provide the most reliable and versatile concealed overhead door control. They are designed for installation on virtually all types of doors mounted on conventional type butt hinges, pivots, continuous hinges, swing clear hinges and numerous other specialty hinges. When used in conjunction with many surface-applied door closers, 100 Series holders and stops provide the most effective control for entrance doors and vestibule doors of all types, as well as heavy or often used interior doors. Templates provided allow for variable mounting positions, ranging from 85° - 110° of opening.

Five models:

- 100H Series hold-open model
- 100HP Series internal hold-open model
- 100F Series friction hold-open model
- 100S Series stop-only model
- 100SE Series special stop-only model

Six sizes:

- Each model comes in six sizes.
- Simple
- Standardized

Three options:

- ADJ—Adjustable jamb bracket
- CJ—Jamb Bracket for use with LCN 5030 closer
- SOC—Pin-in-socket security screw package

Unmatched convenience:

- Non-handed
- Improved compatibility with door closers
- Single/double-acting doors
- Interior/exterior applications
- Reduced door prep
- Durable
- Improved corrosion resistance
- Function conversion kits are available

Materials and finishes

In heavy gauge brass or 300 Series stainless steel, these models offer the broadest range of finishes in the industry, complementing any design and offering the highest resistance to corrosion. Available in the following finishes:

BHMA	US	Finish description
605	US3	Polished Brass
606	US4	Satin Brass
612	US10	Satin Bronze
613	US10B	Oil Rubbed Bronze
619	US15	Satin Nickel
625	US26	Polished Chrome
626	US26D	Satin Chrome
629	US32	Bright Stainless Steel
630	US32D	Stainless Steel
643E/716	–	Aged Bronze, Blackened, Edge Relieved
706	SP4	Powder Coat Brass
691	SP10	Powder Coat Bronze
689	SP28	Powder Coat Aluminum
695	SP313	Powder Coat Dark Bronze
622	SPBLK	Powder Coat Black

Models

These models provide a wide range of optional features, and are ideal for use on entrance and vestibule doors, large doors, doors opened frequently, or doors subject to abuse. These models are also furnished with an offset-style jamb bracket.

Designed for heavy-duty applications, 100 Series models will provide long-lasting protection to doors, frames, hinges, related hardware and surrounding walls or obstructions.

100H Series hold-open

(Suffix H) The hold-open function should be used where it is desired to hold a door open at a predetermined position for short or long periods of time, permitting an unobstructed traffic flow through the opening.

These models are both selective and adjustable, featuring the most reliable hold-open mechanism available. They feature a control knob which protrudes from the face of the door and turns the hold-open function on or off. Set in the inactive position, the unit acts as a stop and shock absorber. The tension on the hold-open mechanism can be adjusted using an Allen wrench to offset air currents or other exterior conditions. The hold-open tension adjustment is located in the bottom of the track in the top of the door.

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5BB1



5 Knuckle, ball bearing full mortise hinge

- Recommended for medium weight doors (<150 lbs)
- Recommended for medium frequency usage (<400 cycles per day)
- Made with two ball bearing assemblies
- Recommended for use with a door closer
- Packed with fasteners for hollow metal and wood doors
  - 12-24 x 1/2 UFPHMS, 12 x 1 1/4 FPHWS
  - 10-24 x 1/2 UFPHMS, 10 x 1 FPHWS (3.5x3.5 hinge size only)

Specifications

Material substrate	Made from brass, 1040 steel or 304 series stainless steel
Certifications	▪ Certified to ANSI/BHMA A156.1 for performance standards ▪ Meets ANSI/BHMA 156.7 for template hinge dimensions ▪ UL Classified for windstorm rated assemblies - R37965 ▪ UL10C Listed for steel only (3 hour)

Dimensions

Height x Width	Size (mm)	Gauge
3.5 x 3.5	89 x 89	0.123
4 x 4	102 x 102	0.130
4.5 x 4	114 x 102	0.134
4.5 x 4.5	114 x 114	0.134
5 x 4.5	127 x 114	0.146
5 x 5	127 x 127	0.146

Refer to General Hinge Information page to determine proper hinge for application

Options

NRP	Non-removable pin	**TW4**	Four wire
HT	Hospital tip	**TW4M***	Four wire with monitor
SH	Security stud - comes standard with NRP	**TW8**	Eight wire
RC-1/4, RC-5/8	Rounded corners	**TW8M***	Eight wire with monitor
SEC	Security fasteners - pin-in-socket (for hollow metal doors and frames only)	**TW12**	Twelve wire
		MON*	Monitor

*TW and MON options are not available on 4 x 4 or smaller.

Finishes

BHMA	Description	Substrate	Finish
600	Primer Paint	Steel	USP
605	Bright Brass	Brass	US3
606	Satin Brass	Brass	US4
612	Satin Bronze	Brass	US10
613	Oil Rubbed Bronze	Brass	US10B
614	Oxidized Bronze	Brass	US10A
619	Satin Nickel	Brass	US15
622	Matte Black	Brass	B-BLK
625	Bright Chrome	Brass	US26
626	Satin Chrome	Brass	US26D
643e/716	Aged Bronze	Brass	B-643e/716
695	Dark Bronze Painted	Brass	B-695/US10BE
629	Bright Stainless	Stainless steel	US32
630	Satin Stainless	Stainless steel	US32D
631	Matte Black	Steel	F-BLK
632	Bright Brass	Steel	US3
633	Satin Brass	Steel	US4
639	Satin Bronze	Steel	US10
640	Oil Rubbed Bronze	Steel	US10B
641	Oxidized Bronze	Steel	US10A
646	Satin Nickel	Steel	US15
651	Bright Chrome	Steel	US26
652	Satin Chrome	Steel	US26D
643e/716	Aged Bronze	Steel	F-643e/716
695	Dark Bronze Painted	Steel	F-695/US10BE

For other colors, consult factory.

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5BB1HW



5 Knuckle, ball bearing, heavy weight full mortise hinge

- Recommended for heavier weight doors (>150 lbs)
- Recommended for high frequency usage (400 cycles per day)
- Made with four ball bearing assemblies
- Recommended for use with a door closer
- Packed with fasteners for hollow metal and wood doors
  – 12-24 x ½ UFPHMS, 12 x 1¼ FPHWS

Specifications

Material substrate	Made from brass, 1040 steel or 304 series stainless steel
Certifications	▪ Certified ANSI/BHMA A156.1 for performance standards ▪ Meets ANSI/BHMA 156.7 for template hinge dimensions ▪ UL Classified for windstorm rated assemblies - R37965 ▪ UL 10C Listed for steel only (3 hour)

Dimensions

Height x Width	Size (mm)	Gauge
4.5 x 4	114 x 102	0.180
4.5 x 4.5	114 x 114	0.180
5 x 4.5	127 x 114	0.190
5 x 5	127 x 127	0.190

Refer to General Hinge Information page to determine proper hinge for application

Options

NRP	Non-removable pin	**TW4**	Four wire
HT	Hospital tip	**TW4M**	Four wire with monitor
SH	Security stud - comes standard with NRP	**TW8**	Eight wire
RC-¼, RC-⅝	Rounded corners	**TW8M**	Eight wire with monitor
SEC	Security fasteners - pin-in-socket (for hollow metal doors and frames only)	**TW12**	Twelve wire
		MON	Monitor

Finishes

BHMA	Description	Substrate	Finish
600	Primer Paint	Steel	USP
605	Bright Brass	Brass	US3
606	Satin Brass	Brass	US4
612	Satin Bronze	Brass	US10
613	Oil Rubbed Bronze	Brass	US10B
614	Oxidized Bronze	Brass	US10A
619	Satin Nickel	Brass	US15
622	Matte Black	Brass	B-BLK
625	Bright Chrome	Brass	US26
626	Satin Chrome	Brass	US26D
643e/716	Aged Bronze	Brass	B-643e/716
629	Bright Stainless	Stainless steel	US32
630	Satin Stainless	Stainless steel	US32D
631	Matte Black	Steel	F-BLK
632	Bright Brass	Steel	US3
633	Satin Brass	Steel	US4
639	Satin Bronze	Steel	US10
640	Oil Rubbed Bronze	Steel	US10B
641	Oxidized Bronze	Steel	US10A
646	Satin Nickel	Steel	US15
651	Bright Chrome	Steel	US26
652	Satin Chrome	Steel	US26D
643e/716	Aged Bronze	Steel	F-643e/716
695	Dark Bronze Painted	Steel	F-695/US10BE

For other colors, consult factory.

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Hinges and pivots

Aluminum geared continuous hinges

112XY



Full mortise - narrow frame and door leaf

- For 1 3/4" doors
- Patented center loaded, interlocking bearing design
- Non-handed for custom cut lengths
- Flush mounted, no inset
- 48" Maximum door width
- Beveled or square edge doors
- Frame guidance lip is extended further for retrofit applications to cover existing heavy weight architectural hinge preps
- For doors weighing up to 450 pounds without reinforcing, 600 pounds with reinforcing

Specifications

Standard length	83", 85", 95", 119"
Standard mounting hardware	12-24 x 3/4" Steel self drilling/self tapping Phillips-head screw
Certifications	▪ Exceeds Grade 1 ANSI/BHMA 156.26 for 150lbs and 300lbs ▪ UL10C listed (90 min)

Options

EPT	Electric power transfer
TWP CON	Electrical through-wire panel with Allegion Connect

Optional mounting hardware

SECHM	Security screws - hollow metal door and frame
SECWDHM	Security screws - 1/2 wood, 1/2 hollow metal
SECWDWD	Security screws - wood door and frame
TEKSWD	1/2 Self drill, self tap 1/2 wood
WD	Wood door and frame

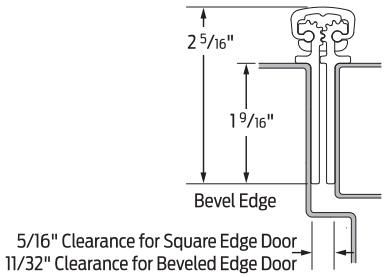
Finishes

BHMA	Description	Substrate	Finish
628	Clear Aluminum Anodized	Aluminum	US28
710	Dark Bronze Anodized	Aluminum	313AN
711	Black Anodized	Aluminum	315AN

Custom anodizing and painting are available, consult factory

For single door applications:

For pairs of doors see chart and general information.



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WS401/WS402CVX, WS401/WS402CCV



WS401/WS402CCV

Wall bumpers (convex and concave models)

- Constructed in heavy-duty cast brass
- Special retainer ring makes rubber tamper resistant
- Grey rubber bumper
- WS401/402CVX – convex rubber bumper, packed with fasteners for drywall/wood applications
- WS401/402CCV – concave rubber bumper which avoids damage to locks with projecting buttons, packed with fasteners for drywall/wood applications

Specifications

Material substrate	Made from cast brass
Certifications	▪ WS401/402CVX Meets ANSI/BHMA 156.16, L12101 ▪ WS401/402CCV Meets ANSI/BHMA 156.16, L12251

Dimensions

Base diameter	Base thickness	Overall projection
2 1/2"	3/8"	1"

Finishes

BHMA	Description	Substrate	Finish
605	Bright Brass	Brass	US3
606	Satin Brass	Brass	US4
612	Satin Bronze	Brass	US10
613	Oil Rubbed Bronze	Brass	US10B
619	Satin Nickel	Brass	US15
625	Bright Chrome	Brass	US26
626	Satin Chrome	Brass	US26D

For other colors, consult factory.
Note: WS401/402 is the full part number. 401 and 402 are not different products.

WS404CVX



Wall stop (convex)

- Compact size
- Constructed in cast brass
- Totally concealed mounting discourages vandalism or tampering
- Unit furnished with grey convex rubber bumper
- Packed with fasteners for drywall/wood applications

Specifications

Material substrate	Made from cast brass

Dimensions

Base diameter	Overall projection
1"	17/32"

Finishes - brass

BHMA	Description	Substrate	Finish
605	Bright Brass	Brass	US3
606	Satin Brass	Brass	US4
609	Blackened Brass	Brass	US5
612	Satin Bronze	Brass	US10
613	Oil Rubbed Bronze	Brass	US10B
619	Satin Nickel	Brass	US15
622	Matte Black	Brass	BLK
625	Bright Chrome	Brass	US26
626	Satin Chrome	Brass	US26D
–	Aged Bronze	Brass	643e/716

For other colors, consult factory.

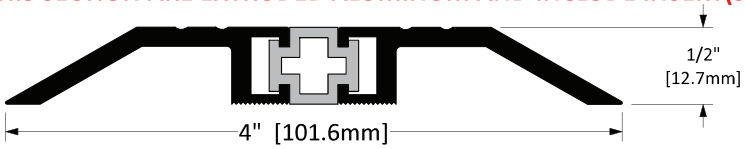
CDH
Commercial Doors & Hardware Ltd.
2150 Winston Park Drive, Unit 16
Oakville, L6H 5V1
NORTH OAKVILLE #3 HCDSB

ALL PRODUCTS ON THIS PAGE

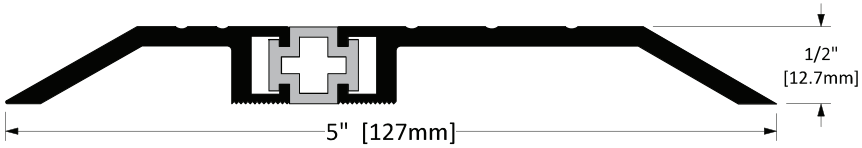
1/2" THERMAL BREAK THRESHOLDS

ALL PRODUCTS IN THIS SECTION ARE EXTRUDED ALUMINUM AND INCLUDE INSERT(S)

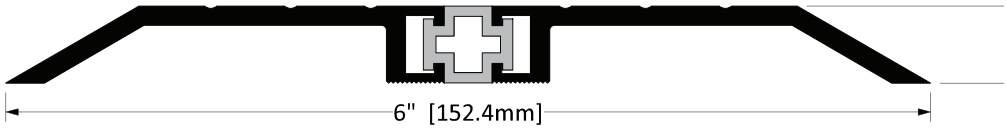
CT-44
Screw Type: G
OPT Screw Type: H, I
STD Finish: Mill



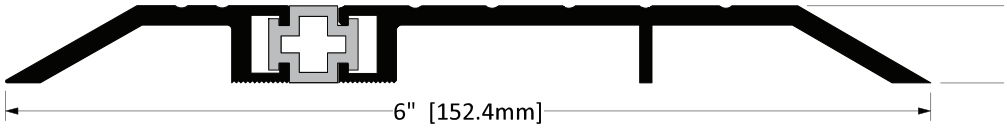
CT-45
Screw Type: G
OPT Screw Type: H, I
STD Finish: Mill



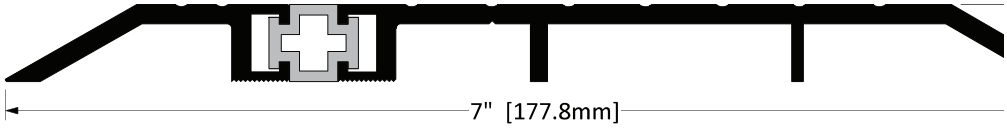
CT-46
Screw Type: G
OPT Screw Type: H, I
STD Finish: Mill



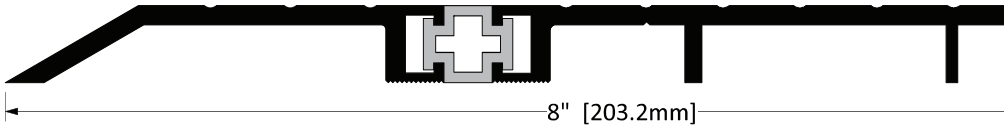
CT-406
Screw Type: G
OPT Screw Type: H, I
STD Finish: Mill



CT-407
Screw Type: G
OPT Screw Type: H, I
STD Finish: Mill



CT-408
Screw Type: G
OPT Screw Type: H, I
STD Finish: Mill



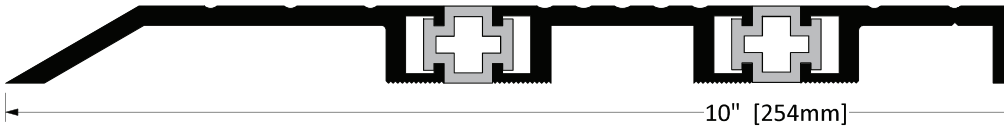
CT-409
Screw Type: G
OPT Screw Type: H, I
STD Finish: Mill



CT-410
Screw Type: G
OPT Screw Type: H, I
STD Finish: Mill



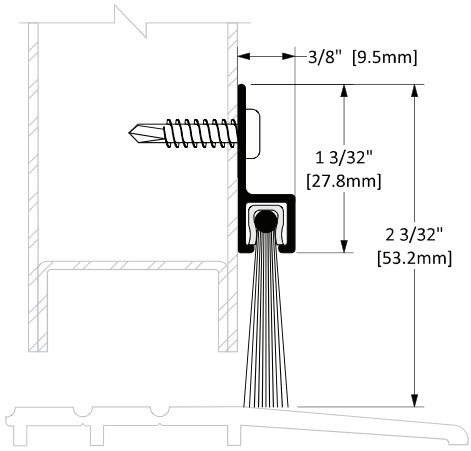
CT-410-2
Screw Type: G
OPT Screw Type: H, I
STD Finish: Mill



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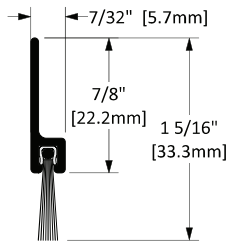
NYLON BRUSH SWEEPS

ALL PRODUCTS ON THIS PAGE



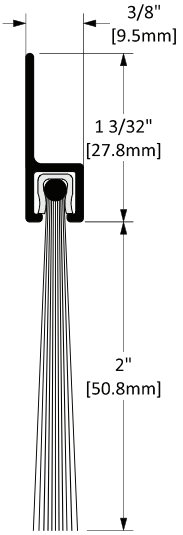
W-24S

Screw Type: A
OPT Screw Type: B
STD Finish: Clear Anodized
OPT Finish: B.A., BL.A.



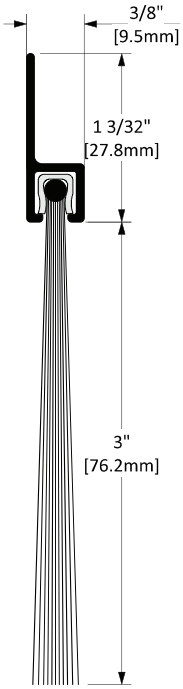
W-25S

Screw Type: A
OPT Screw Type: B
STD Finish: Clear Anodized
OPT Finish: B.A., BL.A.



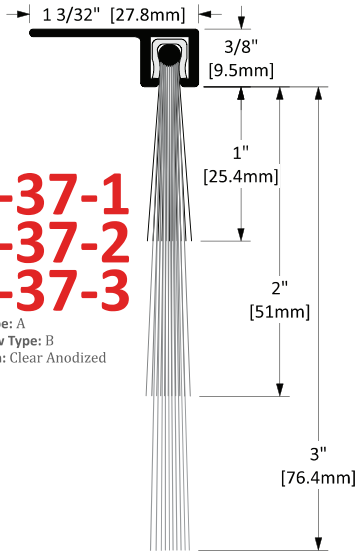
W-33S

Screw Type: A
OPT Screw Type: B
STD Finish: Clear Anodized
OPT Finish: B.A., BL.A.



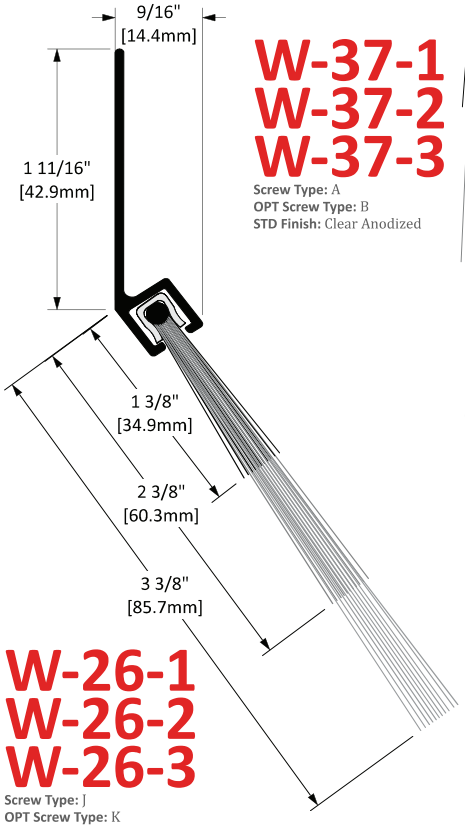
W-34S

Screw Type: A
OPT Screw Type: B
STD Finish: Clear Anodized
OPT Finish: B.A., BL.A.



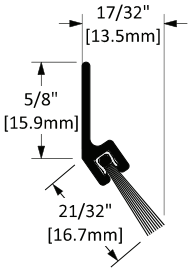
W-37-1
W-37-2
W-37-3

Screw Type: A
OPT Screw Type: B
STD Finish: Clear Anodized



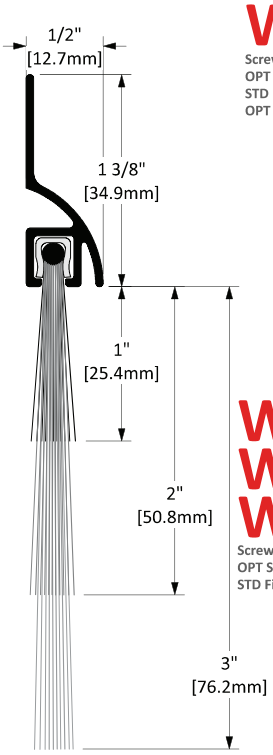
W-26-1
W-26-2
W-26-3

Screw Type: J
OPT Screw Type: K
STD Finish: Mill



W-23

Screw Type: A
OPT Screw Type: B
STD Finish: Clear Anodized

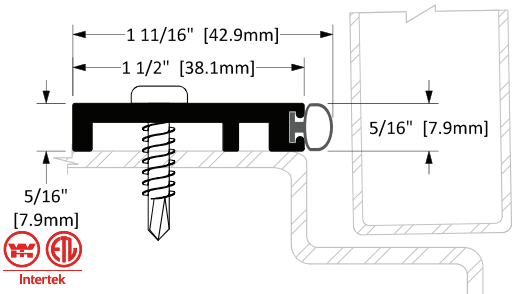


W-35-1
W-35-2
W-35-3

Screw Type: A
OPT Screw Type: B
STD Finish: Clear Anodized

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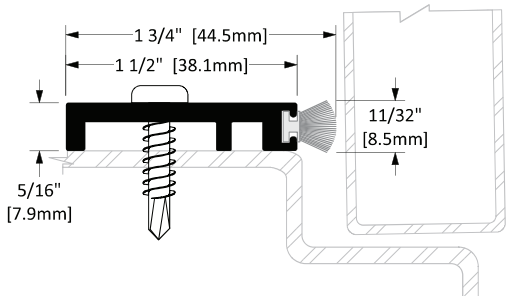
WEATHERSTRIP



Intertek

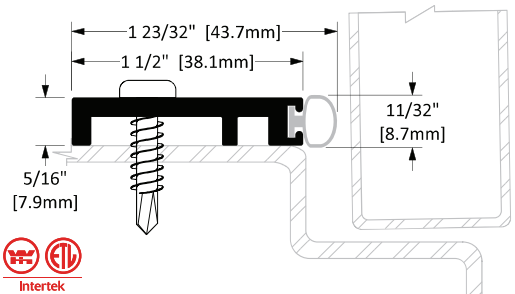
W-20N

WITH NEOPRENE
Screw Type: E
OPT Screw Type: F
STD Finish: Clear Anodized
OPT Finish: B.A., BL.A.



W-20P

WITH PILE
Screw Type: E
OPT Screw Type: F
STD Finish: Clear Anodized
OPT Finish: B.A., BL.A.

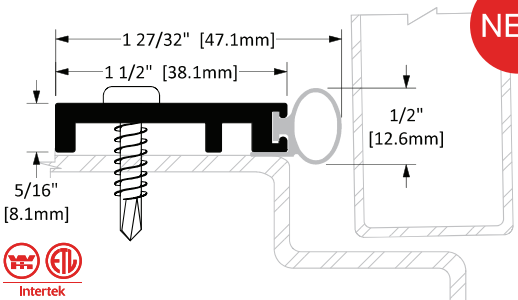


Intertek

W-20S

WITH SILICONE
Screw Type: E
OPT Screw Type: F
STD Finish: Clear Anodized
OPT Finish: B.A., BL.A.

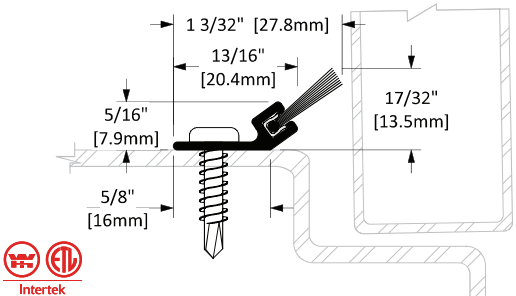
NEW



Intertek

W-2050S

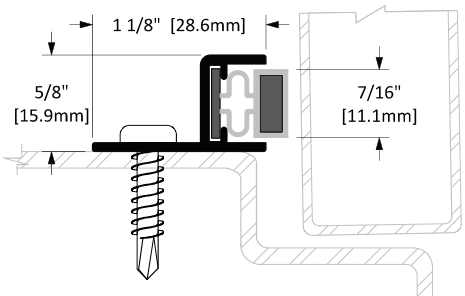
WITH SILICONE
Screw Type: E
OPT Screw Type: F
STD Finish: Clear Anodized
OPT Finish: B.A., BL.A.



Intertek

W-23

WITH BRUSH
Screw Type: A
OPT Screw Type: B
STD Finish: Clear Anodized



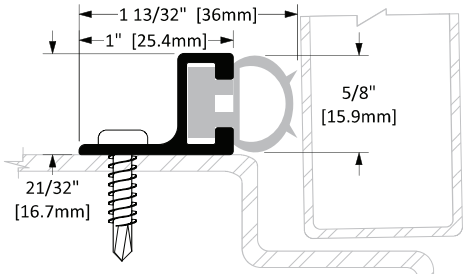
W-27

WITH VINYL & MAGNET
Screw Type: A
OPT Screw Type: B
STD Finish: Clear Anodized

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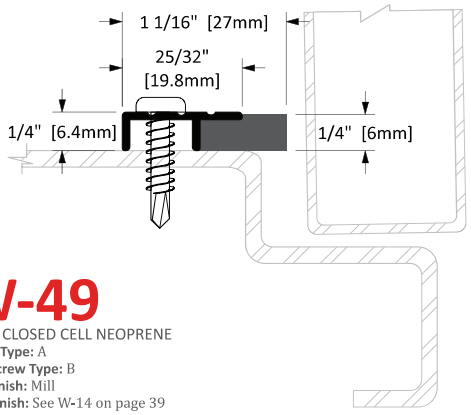
ALL PRODUCTS ON THIS PAGE

WEATHERSTRIP



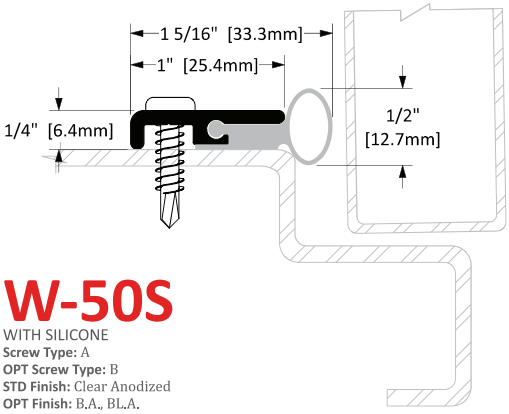
W-47S

WITH SILICONE
Screw Type: A
OPT Screw Type: B
STD Finish: Clear Anodized



W-49

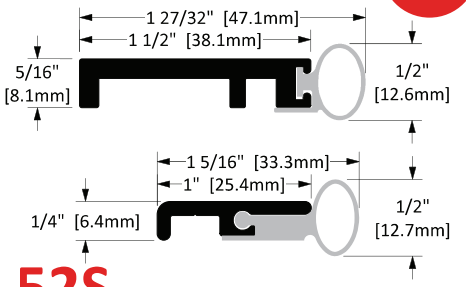
WITH CLOSED CELL NEOPRENE
Screw Type: A
OPT Screw Type: B
STD Finish: Mill
OPT Finish: See W-14 on page 39



W-50S

WITH SILICONE
Screw Type: A
OPT Screw Type: B
STD Finish: Clear Anodized
OPT Finish: B.A., BL.A.

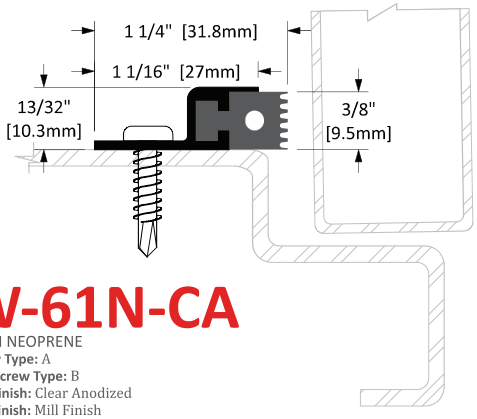
NEW



W-52S

WITH SILICONE
Screw Type: E
OPT Screw Type: F
STD Finish: Clear Anodized
OPT Finish: B.A., BL.A.

SET INCLUDES:
ONE (1) W-2050S X HEADER WIDTH &
TWO (2) W-50S X JAMB HEIGHT.



W-61N-CA

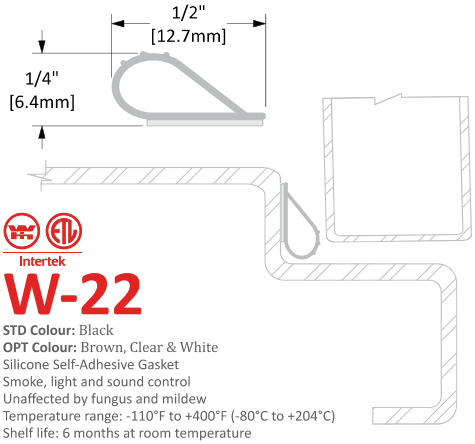
WITH NEOPRENE
Screw Type: A
OPT Screw Type: B
STD Finish: Clear Anodized
Opt Finish: Mill Finish

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ALL PRODUCTS ON THIS PAGE USED FOR EFFECTIVE SOUND CONTROL

SELF-ADHESIVE WEATHERSTRIP

Compressed size: 3/32 in [2.4 mm]



Intertek

W-22

STD Colour: Black
OPT Colour: Brown, Clear & White
Silicone Self-Adhesive Gasket
Smoke, light and sound control
Unaffected by fungus and mildew
Temperature range: -110°F to +400°F (-80°C to +204°C)
Shelf life: 6 months at room temperature

NEW



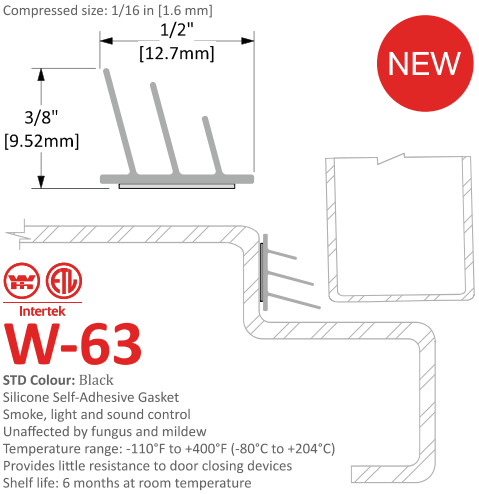
Intertek

W-22AL

STD Colour: Black
Anti-Ligature Silicone Self-Adhesive Gasket
Designed to break apart every 8 in [203.2 mm] to prevent strangulation
Smoke, light and sound control
Unaffected by fungus and mildew
Temperature range: -110°F to +400°F (-80°C to +204°C)
Applications: psychiatric facilities, prisons and other treatment facilities
Shelf life: 6 months at room temperature

Compressed size: 1/16 in [1.6 mm]

NEW

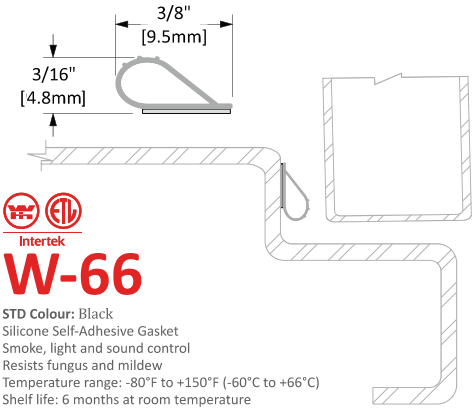


Intertek

W-63

STD Colour: Black
Silicone Self-Adhesive Gasket
Smoke, light and sound control
Unaffected by fungus and mildew
Temperature range: -110°F to +400°F (-80°C to +204°C)
Provides little resistance to door closing devices
Shelf life: 6 months at room temperature

Compressed size: 3/32 in [2.4 mm]

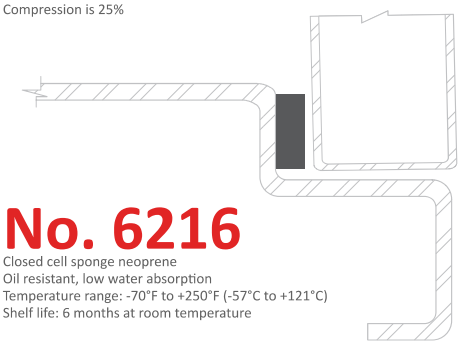


Intertek

W-66

STD Colour: Black
Silicone Self-Adhesive Gasket
Smoke, light and sound control
Resists fungus and mildew
Temperature range: -80°F to +150°F (-60°C to +66°C)
Shelf life: 6 months at room temperature

Compression is 25%



No. 6216

Closed cell sponge neoprene
Oil resistant, low water absorption
Temperature range: -70°F to +250°F (-57°C to +121°C)
Shelf life: 6 months at room temperature

ADHESIVE-BACKED NEOPRENE WEATHERSTRIP

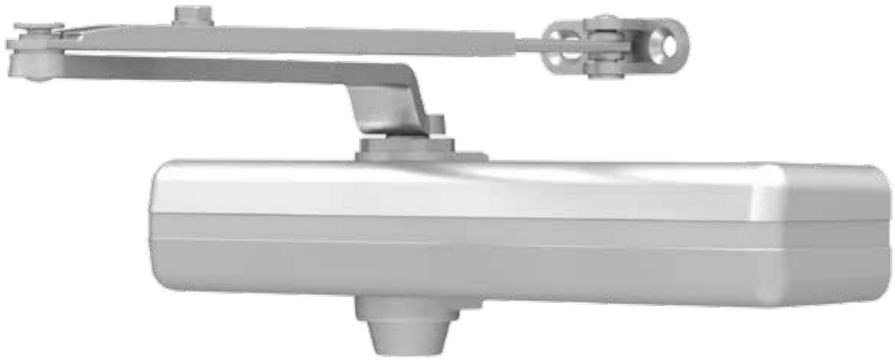
1/8" X 3/8" X 50' BLACK
1/8" X 3/8" X 50' GREY
1/8" X 3/8" X 50' WHITE
1/8" X 1/2" X 50' BLACK
1/4" X 3/8" X 25' BLACK
1/4" X 1/2" X 25' BLACK
1/4" X 3/4" X 25' BLACK
3/8" X 1/2" X 25' BLACK
1/2" X 3/4" X 25' BLACK

Please contact KN Crowder at customerservice@kncrowder.com or 1-866-999-1562 for other colours/sizes. Minimum order is required.

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1460 Series

Features

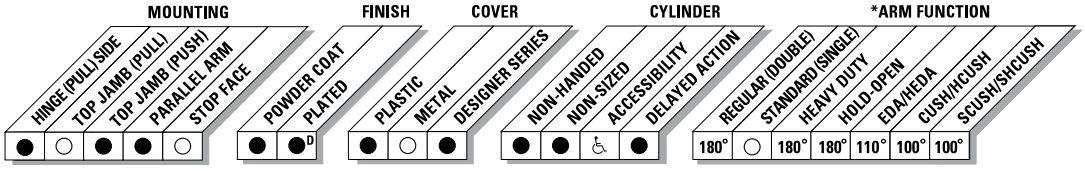


Designed for maximum versatility, the 1460, available with multiple cover options, can be used for both commercial and institutional applications. This fully universal closer offers a wide variety of options and fast and accurate installation.

Certifications	Grade 1 - ANSI A156.4, UL 10C, ADA, 100 Hour Salt Spray, Meets BAA - Buy American Act
Body Construction	■ Cast Iron Body ■ Full Complement Bearing ■ 1-1/4″ Diameter Piston ■ 3/4″ Diameter Single Heat Treated Pinion Journal
Fluid	All Weather Fluid
Handing	Non-Handed
Templating	Peel-n-Stick templates - 1″ x 7-1/2″ Mounting Hole Pattern
Size	Adjustable Spring Size 1-6. Includes Patented Green Dial
Warranty	30 years

Cover	■ Slim Line Plastic, Standard ■ Full Plastic and Metal Designer Series, Optional
Fasteners	Self Reaming and Tapping Screws (SRT)
Mounting	Hinge (Pull Side), Top Jamb (Push Side), Parallel Arm (Push Side)
Arms	Standard regular pull side, and top jamb
Finishes/Colors/ Powder Coat	■ Aluminum (689) ■ Statuary Bronze (690) ■ Light Bronze (691) ■ Black (693) ■ Dark Bronze (695) ■ Brass (696) ■ Custom colors optional ■ Optional SRI primer - powder coat only ■ Optional plated finishes

Special Templates | Customized installation templates or products may be available to solve unusual applications. Contact LCN Product Support for assistance.



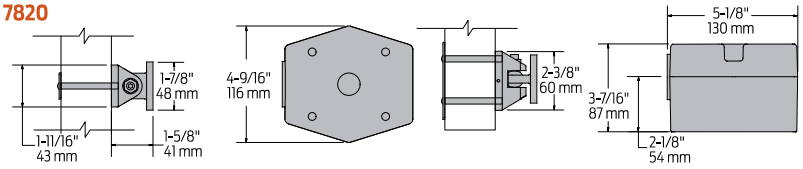
● AVAILABLE
○ NOT AVAILABLE

Closer available with less than 5.0 lbs. opening force on 36″ door.
** Maximum opening/hold-open point with standard template.*
D = For designer series only.

CDH
Commercial Doors & Hardware Ltd.
2150 Winston Park Drive, Unit 16
Oakville, L6H 5V1

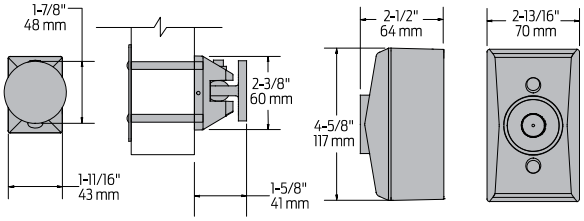
NORTH OAKVILLE #3 HCDSB

7820



Mounting	Floor mounted
Total Projection	6-3/4″ (171 mm)

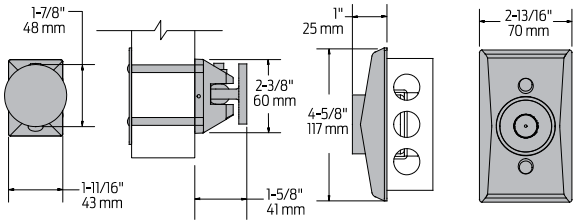
7830



Mounting	Surface wall mounted
Total Projection	4-1/8″ (105 mm)

- Suitable for use in pocket door installations

7840

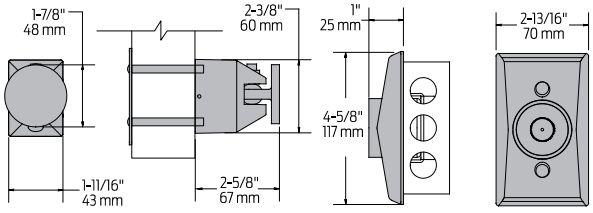


Mounting	■ Low profile recessed wall mount ■ 2″ (51 mm) x 4″ (102 mm) x 1-1/2″ (38 mm)
Total Projection	2-5/8″ (67 mm)

- Suitable for use in pocket door installations

Note:
Outlet box not included.

7850



Mounting	■ Standard profile recessed wall mount ■ 2″ (51 mm) x 4″ (102 mm) x 1-1/2″ (38 mm)
Total Projection	3-5/8″ (92 mm)

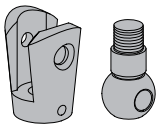
- Suitable for use in pocket door installations

Note:
Outlet box not included.

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Extensions



SEM7810-514
Coupler Assembly Kit

- Required for each door needing extension(s)
- Kit includes coupler link and ball pivot (alone serves as a 1-1/2″ extension)



SEM7810-E050
Extension - 1/2″

- Metal
- Standard



SEM7810-E075
Extension - 3/4″

- Metal
- Standard



Extension, SEM7810-E100
Extension - 1″

- Metal
- Standard



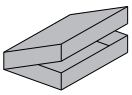
SEM7810-E200
Extension - 2″

- Metal
- Standard



Extension, SEM7810-E400
Extension - 4″

- Metal
- Standard



SEM7810-517
Extension kit

Extension kit includes:

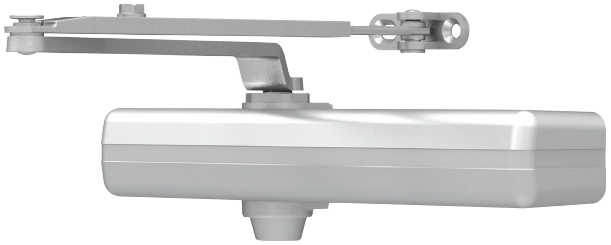
- 10 ..... 7810SEM-E050
- 10 ..... 7810SEM-E075
- 10 ..... 7810SEM-E100
- 5 ..... 7810SEM-E200
- 20 ..... 7810SEM-514

Note: Using just the Coupler Assembly Kit (SEM7810-514) will create a 1-1/2″ link.
Extension Links are available in different lengths and can be combined together to achieve the desired length. Max. recommended length = 12″

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1460 Series



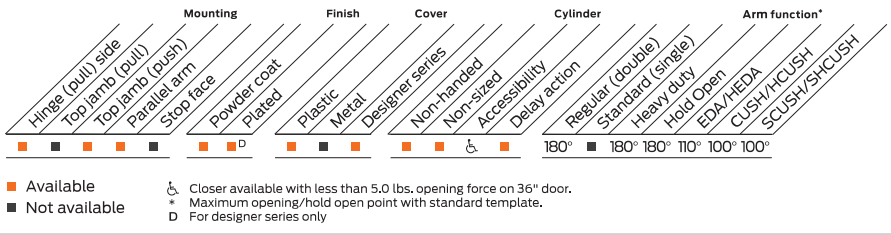
Designed for maximum versatility, the 1460, available with multiple cover options, can be used for both commercial and institutional applications. This fully universal closer offers a wide variety of options and fast and accurate installation.

Features

Certifications	Grade 1 - ANSI A156.4, UL 10C, ADA, 100 hour salt spray, meets BAA - Buy American Act
Body construction	▪ Cast iron body ▪ Full complement bearing ▪ 1 1/4" diameter piston ▪ 3/4" diameter single heat treated pinion journal
Fluid	All weather fluid
Handing	Non-handed
Templating	Peel-n-Stick templates - 1" x 7 1/2" mounting hole pattern
Size	Adjustable Spring Size 1-6 (Includes patented Green Dial)
Warranty	30 years

Cover	▪ Slim line plastic, standard ▪ Full plastic and metal designer series, optional
Fasteners	Self reaming and tapping screws (SRT)
Mounting	Hinge (pull side), top jamb (push side), Parallel arm (push side)
Arms	Standard regular pull side, and top jamb
Finishes/colors/ powder coat	▪ 689 Aluminum ▪ 690 Statuary Bronze ▪ 691 Light Bronze ▪ 693 Black ▪ 695 Dark Bronze ▪ 696 Brass ▪ Custom colors optional
	▪ Optional SRI primer - powder coat only ▪ Optional plated finishes

Special templates | Customized installation templates or products may be available to solve non-standard applications. Contact LCN Product Support for assistance.



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4020 Series



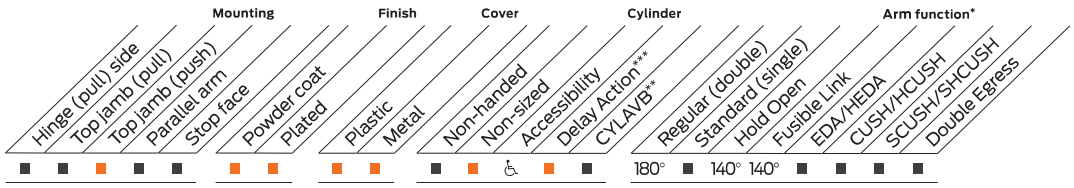
The 4020 is a heavy duty closer with adjustable spring power using the LCN Green Dial. This creates a custom fit to meet the specific demands of high traffic use and brings reliable performance.

Features

Certifications	Grade 1 - ANSI A156.4, UL 10C, ADA, 100 hour salt spray, meets BAA - Buy American Act
Body construction	▪ Cast iron body ▪ Full complement bearing ▪ 1 1/2" diameter piston ▪ 11/16" diameter double heat treated pinion journal
Fluid	All weather fluid
Handing	Handed
Templating	Peel-n-Stick templates - 2 1/2" x 6" mounting hole pattern
Size	Adjustable 1-5 or sized 6
Warranty	30 years

Cover	▪ Plastic Cover (PC), standard ▪ Metal Cover (MC), optional
Fasteners	Self Reaming and Tapping Screws (SRT)
Mounting	Top jamb (Push side)
Arms	Regular arm
Finishes/colors/ powder coat	▪ 622 Matte black ▪ 689 Aluminum ▪ 690 Statuary bronze ▪ 691 Light bronze ▪ 693 Black ▪ 695 Dark bronze ▪ 696 Brass ▪ Custom colors optional
	▪ Optional SRI primer - powder coat only ▪ Optional plated finishes

Special templates | Customized installation templates or products may be available to solve non-standard applications. Contact LCN Product Support for assistance.



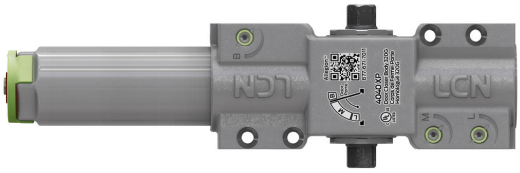
■ Available
■ Not available

Closer available with less than 5.0 lbs. opening force on 36" door.
* Maximum opening/hold open point with standard template.
** Advanced Variable Back Check.
*** Delay action for 4040XP incorporates standard 4041 cylinder.

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4040XP Series





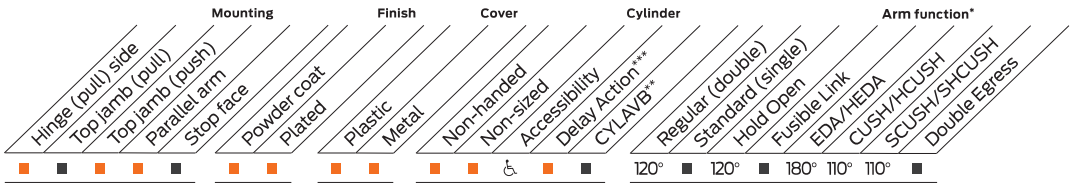
The 4040XP Series is LCN's most popular door closer—and for good reason. This durable non-handed, surface-mounted heavy-duty closer, is designed for the most demanding high-use-and-abuse applications as well as for easy installation and maintenance.

Features

Certifications	Grade 1 - ANSI A156.4, UL 10C, ADA, 100 hour salt spray, meets BAA - Buy American Act
Body construction	▪ Patented positive stop ▪ Patented regulation valve indicators ▪ Independent speed adjustments ▪ QR code for instructions and support ▪ Cast iron body ▪ Full complement bearing ▪ 1 ½" diameter piston ▪ Double heat treated pinion journal
Fluid	All weather liquid X fluid
Handing	Non-handed
Templating	Peel-n-Stick templates - 2 ¼" x 5" mounting hole pattern
Size	Adjustable spring size 1-6, includes LCN Green Dial
Warranty	30 years

Cover	▪ Redesigned snap-fit plastic cover (PC) with improved retention fit, standard ▪ Metal Cover (MC), optional
Fasteners	Self reaming and tapping screws (SRT)
Mounting	Hinge (pull side), top jamb (push side), parallel arm (push side)
Arms	Regular arm
Finishes/colors/ powder coat	▪ 622 Matte black ▪ 689 Aluminum ▪ 690 Statuary bronze ▪ 691 Light bronze ▪ 693 Black ▪ 695 Dark bronze ▪ 696 Brass ▪ Custom colors optional
	▪ Optional SRI primer - powder coat only ▪ Optional plated finishes

Special templates | Customized installation templates or products may be available to solve non-standard applications. Contact LCN Product Support for assistance.



■ Available
■ Not available

♿ Closer available with less than 5.0 lbs. opening force on 36" door.
* Maximum opening/hold open point with standard template.
** Advanced Variable Back Check.
*** Delay feature incorporates standard 4040 cylinder (not XP).

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Accessories

Cylinders

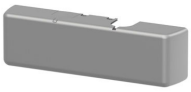


4040XP-3071
Cast iron cylinder assembly (CYL)
- Non-handed
- Heavy duty



4041-3071 DEL
Delay Action Cylinder (CYLDEL)
- Used for delayed action closing
- Non-handed
- Heavy duty

Covers



4040XP-72
plastic cover (PC)
- Non-handed
- Includes 4040XP-54 snap-on cover clip
- Redesigned patented snap-fit cover with improved retention fit



4040XP-72MC
metal cover (MC)
- Handed
- Required for plated finishes and custom powder coat finishes
- Optional

Arms



4040XP-3077
Regular Arm (REGARM)
- Non-handed
- Mounts pull side or top jamb with shallow reveal P4041 closer includes PA shoe, 4040XP-62PA required for parallel arm mounting



4040XP-3077L
Long Arm (LONG)
- Non-handed
- Includes long rod and shoe, 4040XP-79LR for top jamb mount
- Optional



4040XP-3077ELR
Extra Long Arm (XLONG)
- Non-handed
- Includes extra long rod and shoe, 4040XP-79ELR for top jamb mount with deep reveal
- Optional



4040XP-3049
Hold Open Arm (H)
- Non-handed
- Mounts pull side or top jamb with shallow reveal, hold open adjustable shoe
- 4040XP closer includes 4040XP-62PA shoe required for parallel arm mounting
- Optional



4040XP-3049L
Hold Open Long Arm (HLONG)
- Non-handed
- Includes long head and tube, 4040XP-3048L for top jamb mount
- Optional



4040XP-3077EDA
Extra Duty Arm (EDA)
- Non-handed
- Features forged, solid steel main and forearm for potentially abusive installations
- Optional



4040XP-3049EDA
Hold Open Extra Duty Arm (HEDA)
- Handed
- Parallel arm features forged, solid steel main and forearm for potentially abusive installations
- Hold open function is adjusted at the shoe
- Optional



4040XP-3077EDA/62G
Extra Duty Arm with 62G Thick Hub Shoe (EDAW62G)
- Non-handed
- Features forged, solid steel main and forearm for potentially abusive installations
- 62G shoe provides additional blade stop clearance
- Optional



4040XP-3049EDA/62G
Hold Open Extra Duty arm with 62G Thick Hub Shoe (HEDA62G)
- Handed
- Features forged, solid steel main and forearm for potentially abusive installations
- 62G shoe provides additional blade stop clearance; hold open function is adjusted at the shoe
- Optional



4040XP-3077CNS
Cush-n-Stop Arm (CUSH)
- Non-handed
- Features solid forged steel main arm and forearm with stop in soffit shoe.
- Optional



4040XP-3049CNS
Hold Open Cush-n-Stop Arm (HCUSH)
- Non-handed
- Hold open function with templated stop/hold open points
- Handle controls hold open function
- Optional

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Accessories

Arms (cont.)



4040XP-3077SCNS
Spring Cush-n-Stop Arm (SCUSH)
- Non-handed
- For potentially abusive applications features solid forged steel main arm and forearm with spring loaded stop in the soffit shoe
- Optional



4040XP-3049SCNS
Spring Hold Open Cush-n-Stop Arm (SHCUSH)
- Non-handed
- For potentially abusive applications features solid forged steel main arm and forearm with spring loaded stop in the soffit shoe
- Handle controls hold open function
- Optional

Installation accessories



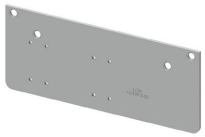
4040XP-18
Plate
- Required for hinge side mount where top rail is less than 3 3/4" (95 mm)
- Requires minimum 2" (51 mm) minimum top rail



4040XP-18G
Plate
- Locates top jamb mounted closer flush with top of head frame face in flush ceiling condition
- Requires 1 3/4" (44 mm) minimum head frame



4040XP-18TJ
Plate
- Centers top jamb mounted closer vertically on head frame where face is less than 3 1/2" (89 mm). Plate requires 1 3/4" (44 mm) minimum head frame



4040XP-18PA
Plate
- Required for parallel arm mounting where top rail is less than 5 1/2" (140 mm), measured from the stop
- Requires 2" (51 mm) minimum top rail



4040XP-62PA
PA shoe
- Required for parallel arm mounting



4040XP-30
CUSH shoe support
- Provides anchorage for fifth screw used with CUSH arms, where reveal is less than 3 1/16" (78 mm)
- Optional



4040XP-61
Blade stop spacer
- Required to lower parallel arm shoe to clear 1/2" (13 mm) blade stop
- Optional



4040XP-419
PA flush panel adapter
- Provides horizontal mounting surface for parallel arm shoe on single rabbeted or flush frame
- Optional



4040XP-62A
Auxiliary shoe
- Requires a top rail of 7" (178 mm)
- Shoe replaces -62PA for parallel arm mounting of regular arm with overhead holder/stop
- Optional



4040XP-54
Snap-on cover clip
- Used to secure 4040XP-72 plastic cover to cylinder body

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Designs and finishes

The Standard Collection

The Standard Collection levers can be paired with exit devices and locks from our trusted Schlage and Von Duprin brands. And, they are built to the same exacting standards. Our Standard Collection levers offer a more traditional style that is appropriate for use in a number of commercial applications.

01

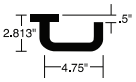


02



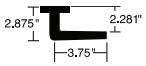


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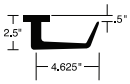


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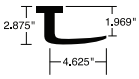


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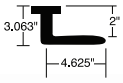


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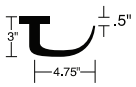


12



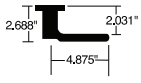


17



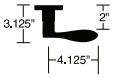


18



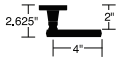


Accent



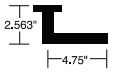


Asti





Latitude





Note: Levers shown with Schlage L Series mortise "A" rose. Knobs shown with rose that is unavailable in the L Series. Additional rose and escutcheon designs available.

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Single cylinder non-deadbolt functions

Schlage ANSI

L9026 –

Exit lock with cylinder

- No outside trim
- Outside cylinder retracts latchbolt
- Inside lever always free for immediate egress
- Auxiliary latch deadlocks latchbolt when door is locked

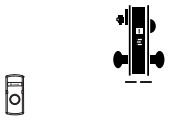


Schlage ANSI

L9050 **F04**
LV9050

Office and inner entry lock

- Latchbolt retracted by lever/knob from either side unless outside lever is locked by key or thumbturn
- With outside locked, latchbolt retracted by key or inside lever
- Outside lever locked until unlocked by thumbturn or key
- Auxiliary latch deadlocks latchbolt when door is closed
- Inside lever always free for immediate egress

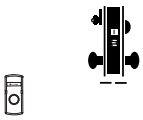


Schlage ANSI

L9056 –
LV9056

L9050 with automatic unlocking

- Latchbolt retracted by lever/knob from either side unless outside lever is locked by key or thumbturn
- With outside locked, latchbolt retracted by key or inside lever
- Outside lever locked until unlocked by thumbturn or key
- Auxiliary latch deadlocks latchbolt when door is closed
- Inside lever always free for immediate egress



Schlage ANSI

L9070 **F05**
LV9070

Classroom lock

- Latchbolt retracted by lever/knob from either side unless outside lever is locked by key
- Unlocked from outside by key
- Auxiliary latch deadlocks latchbolt when door is closed
- Inside lever always free for immediate egress



Schlage ANSI

L9076 **F06**
LV9076

Classroom holdback lock

- Latchbolt retracted by lever/knob from either side unless outside lever is locked by key
- When locked, latchbolt retracted by key or inside lever
- Auxiliary latch deadlocks latchbolt when door is closed
- Holdback feature activated by turning inside lever/knob and rotating key 360°
- Inside lever always free for immediate egress



Schlage ANSI

L9080 **F07**
LV9080

Storeroom lock

- Latchbolt retracted by lever/knob inside or key outside
- Outside lever/knob is always inoperable
- Auxiliary latch deadlocks latchbolt when door is closed
- Inside lever always free for immediate egress



Single cylinder deadbolt functions

Schlage ANSI

L9453 **F20**
LV9453

Entrance lock

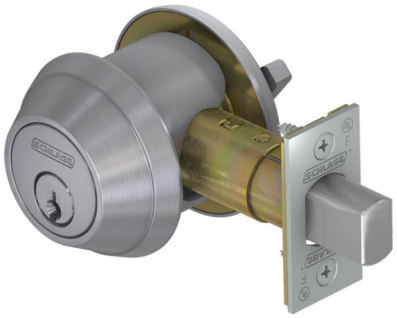
- Latchbolt retracted by lever/knob from either side unless outside locked by 20° thumbturn rotation
- Deadbolt actuation through 90° thumbturn rotation
- When locked, outside key or inside lever/knob retracts both deadbolt and latchbolt
- Outside lever/knob locked until thumbturn is restored to vertical position
- Throwing deadbolt locks outside lever/knob
- Auxiliary latch deadlocks latchbolt when door is closed
- Inside lever always free for immediate egress

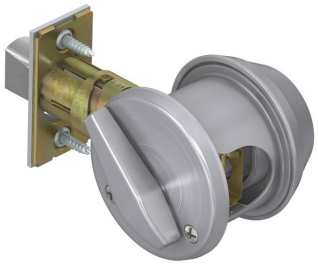


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B600/700/800 Series

Grade 1 Deadbolts





OVERVIEW

Schlage® commercial grade 1 deadbolts are designed for security, durability and beauty. They feature a thick, anti-saw hardened steel bolt with anti-pry, anti-wrench and other protections to make it one tough lock. Optional single- or dual-sided lock status indicator trim features Schlage's patented 180-degree visibility. The large window size and red/white background messaging assures easy readability for even the color blind.

600 Series: Grade 1 deadbolt furnished with Conventional cylinder standard. Also available with Full Size Interchangeable Core (FSIC) or Small Format Interchangeable Core (SFIC).

700 Series: Features the upgraded security of patented Primus RP in Classic Obverse keyways (FSIC or Conventional) or Primus XP in patented Everest 29 keyways (FSIC or Conventional including SL cylinders). Primus levels of security add an independent sidebar and finger pin locking mechanism for resistance to picking, bumping and impressioning.

800 Series: Utilizes a Conventional format Primus XP UL 437 high security cylinder which features added hardened steel drill pins to resist drilling and other forms of physical attack.

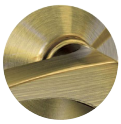
FINISHES



605
Bright Brass



606
Satin Brass



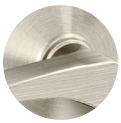
609
Antique Bronze



612
Satin Bronze



613
Oil Rubbed Bronze



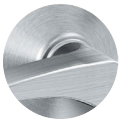
619
Satin Nickel



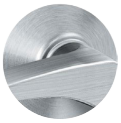
622
Matte Black



625
Bright Chrome



626
Satin Chrome



626AM
Satin Chrome Antimicrobial



643e
Aged Bronze

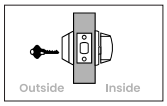
e = an equivalent finish to the BHMA standard.

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LOCK FUNCTIONS

Schlage **ANSI**
B660 **E0151**
B760
B860



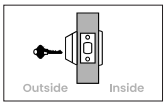
Single cylinder deadbolt



- Key cylinder outside; thumbturn inside
- Deadbolt thrown or retracted by key outside or thumbturn inside
- When installed with optional lock status indicator trim, in unlocked state message displays on white background; in locked state on red background

To order configured with indicator specify function and note indicator code as a special option.

Schlage **ANSI**
B661 **E0161**
B761
B861



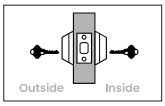
Cylinder x blank plate deadbolt



- Key cylinder outside; blank plate inside
- Deadbolt thrown or retracted by key outside
- When installed with optional lock status indicator trim, in unlocked state message displays on white background; in locked state on red background

To order configured with indicator specify function and note indicator code as a special option.

Schlage **ANSI**
B662 **E0141**
B762
B862



Double cylinder deadbolt

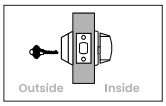


- Key cylinder both sides
- Deadbolt thrown or retracted by key from either side
- When installed with optional lock status indicator trim, in unlocked state message displays on white background; in locked state on red background

Caution: Double cylinder locks on any door, in any structure which is used for egress are a life safety hazard in times of emergency and their use is not recommended. Installation should be in accordance with existing codes only.

To order configured with indicator specify function and note indicator code as a special option.

Schlage **ANSI**
B663 **E0171**
B763
B863



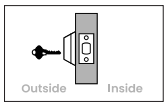
Classroom deadbolt



- Key cylinder outside; thumbturn inside
- Deadbolt thrown or retracted by key outside
- Thumbturn inside can only retract deadbolt
- When installed with optional lock status indicator trim, in unlocked state message displays on white background; in locked state on red background

To order configured with indicator specify function and note indicator code as a special option.

Schlage **ANSI**
B664 **E0101**
B764
B864



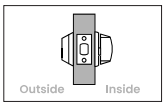
Cylinder only deadbolt

- Key cylinder outside; no inside trim
- Deadbolt thrown or retracted by key outside

Note: Available in Conventional cylinder format only.

Note: 1-1/2" bore only.

Schlage **ANSI**
B672 **–**



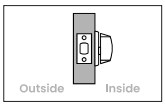
Door bolt with coin turn



- Coin turn outside; thumbturn inside
- Deadbolt thrown or retracted by thumbturn inside
- A flat screwdriver inserted in the coin turn outside can also retract deadbolt
- When installed with optional lock status indicator trim, in unlocked state message displays on white background; in locked state on red background

To order configured with indicator specify function and note indicator code as a special option.

Schlage **ANSI**
B680 **E0191**



Door bolt

- No outside trim; thumbturn inside
- Deadbolt thrown or retracted by thumbturn inside

Note: 1-1/2" bore only.

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Cabinet locks with cylinder

Cabinet deadbolt locks



CL100PB

Cylinder formats:
CL100PB - Conventional format

Interchangeable Core formats:
CL777R - Full Size IC (FSIC)
CL721G - Small Format IC (SFIC)

Rekeying: Release mechanism allows Conventional cylinder replacement. Interchangeable cores replaced using control key

Certifications: ANSI 156.11 - Conventional Grade 1; FSIC and SFIC Grade 2

Body: Die cast zinc

Bolt: Steel 15/16" projection; 3/4" SFIC

Door thickness: 7/8" to 1 3/8"

Barrel diameter: 1 1/8"

Finishes: Conventional and FSIC formats - 605 and 626; SFIC format - 626 only

Drawer deadbolt locks



CL771G

Cylinder formats:
CL200PB - Conventional format

Interchangeable Core formats:
CL888R - Full Size IC (FSIC)
CL771G - Small Format IC (SFIC)

Rekeying: Release mechanism allows Conventional cylinder replacement. Interchangeable cores replaced using control key

Certifications: ANSI 156.11 - Conventional Grade 1; FSIC and SFIC Grade 2

Body: Die cast zinc

Bolt: Steel 3/4" projection

Door thickness: 7/8" to 1 3/8"

Barrel diameter: 1 1/8"

Finishes: Conventional and FSIC formats - 605 and 626; SFIC format - 626 only

Rim deadbolt lock



CL775G

Interchangeable Core format:
CL775G - Small Format IC (SFIC)

Rekeying: Interchangeable core replaced using control key

Body: Die cast zinc cylinder housing, stamped steel back plate and steel case

Bolt: 1/2" projection

Material thickness: up to 1 1/16"

Barrel diameter: 1 1/8"

Compatibility: Retrofits Best 5L Series

Finish: 626

Rim latch



CL725G

Interchangeable Core format:
CL725G - Small Format IC (SFIC)

Rekeying: Interchangeable core replaced using control key

Body: Die cast zinc cylinder housing, stamped steel back plate and steel case

Material thickness: up to 1 1/16"

Barrel diameter: 1 1/8"

Compatibility: Retrofits Best 5L Series

Finish: 626

Cam locks



CL920R

Interchangeable Core formats:
CL920R - Full Size IC (FSIC)
CL720G - Small Format IC (SFIC)

Rekeying: Interchangeable core replaced using control key

Body: Die cast zinc

Body diameter: 1 1/8"; across flats 7/8"

Mounting cutout: 1 5/32"

Material thickness: .08" to 1 1/8"

Finish: 626

Rachet locks



CL729G

Interchangeable Core formats:
CL929R - Full Size IC (FSIC)
CL729G - Small Format IC (SFIC)

Rekeying: Interchangeable core replaced using control key

Body: Die cast zinc

Body diameter: 1 1/8"

Material thickness: up to 1/4"

Finish: 626

Mailbox lock



CL728G

Interchangeable Core format:
CL728G - Small Format IC (SFIC)

Rekeying: Interchangeable core replaced using control key

Body: Die cast zinc housing; steel body

Barrel length: Adjustable

Handing: RH standard

Retrofits: Best BL

Finish: 626

Keying options

Large format keying:
Conventional and FSIC cylinder formats available in standard pin and tumbler, Primus XP and Primus XP UL 437 high-security mechanisms. Everest 29 S123 keyway standard. Classic and restricted keyways also available.

Small format keying:
SFIC cylinder format available in standard pin and tumbler mechanism (A2 pinning); Everest 29 R keyway.

Available keyed alike (KA), keyed different (KD) and master keyed.

FSIC and SFIC construction cores available.

Finishes

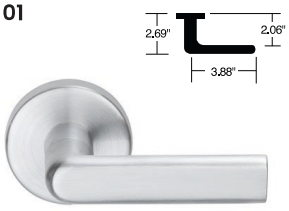
Bright brass 605 | Satin chrome 626

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The Standard Collection

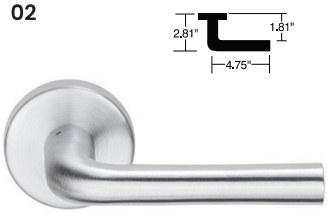
The Standard Collection levers can be paired with exit devices and locks from our trusted Schlage and Von Duprin brands. And, they are built to the same exacting standards. Our Standard Collection levers offer a more traditional style that is appropriate for use in a number of commercial applications.

01



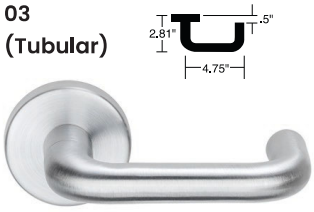
801 - Milled tactile warning

02



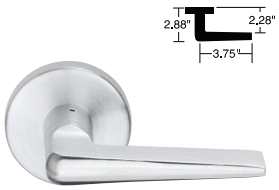
802 - Knurled tactile warning[1]

03 (Tubular)



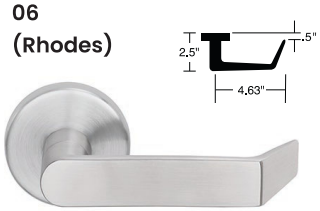
803 - Knurled tactile warning[1]

05



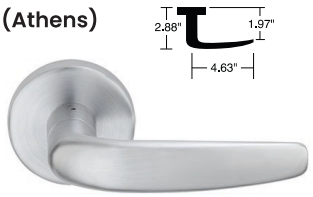
805 - Milled tactile warning

06 (Rhodes)



806 - Milled tactile warning

07 (Athens)



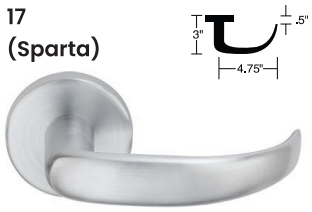
807 - Milled tactile warning

12



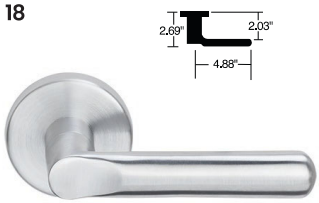
812 - Milled tactile warning
Handed

17 (Sparta)



817 - Milled tactile warning

18



818 - Milled tactile warning

ACC (Accent)



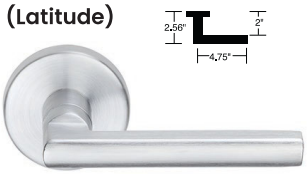
Handed

AST (Asti)



Handed

LAT (Latitude)



1. Knurled tactile warning available on 609, 612, 613, 625, 626, 629, and 630 finishes only.

L Series Mechanical Locks

The Schlage L Series mechanical lock is an industry-leading mortise solution. Designed for flexibility, the L Series mechanical lock is one of only two series in the Schlage lineup offered in ligature-resistant trims for healthcare settings. Other trims and options include the HL hospital latch and widely supported use of visual lock status indication.

The L Series not only exceeds ANSI/BHMA Security Grade 1 and Operational Grade 1 standards, it also serves as the foundation for the Schlage L wired electrified, LE wireless electronic, and multi-point mortise locks.

33 levers and 12 finishes allow seamless suiting across other Allegion lock styles and exit trims to create truly beautiful environments.

Features

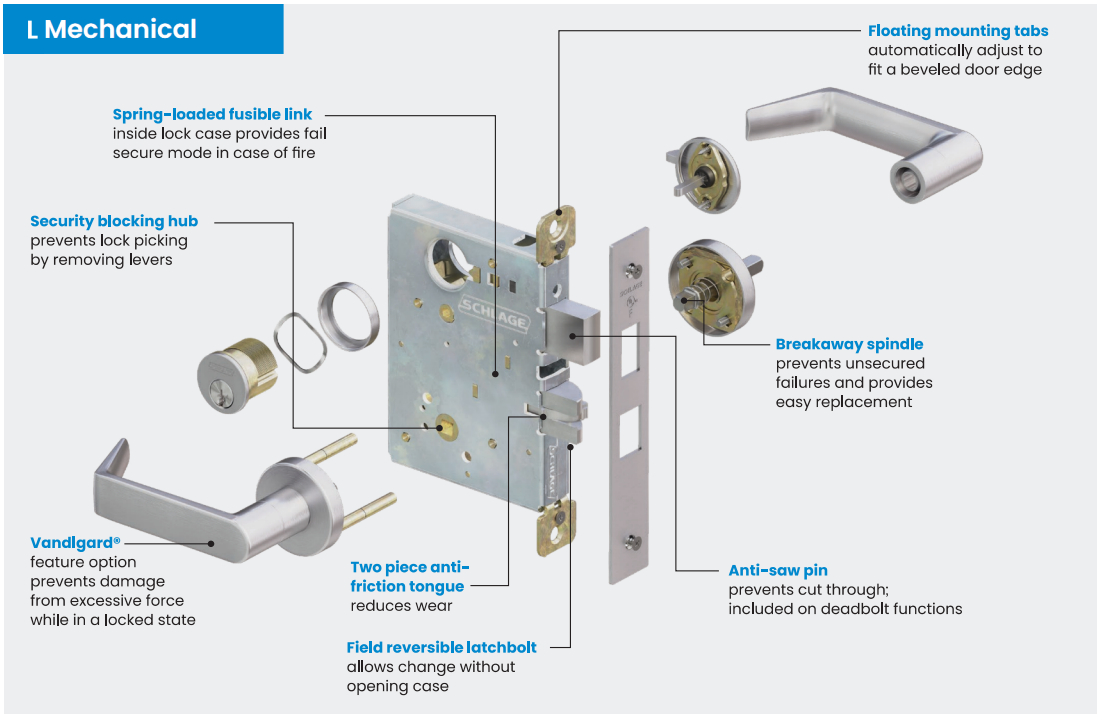
- Exceeds ANSI/BHMA Grade 1 operational and security standards
- Expansive list of configurations and options
- 52 mechanical functions meet the requirements of most applications
- Visual locked/unlocked status indicator options available on most functions
- 12 finishes paired with 33 levers, two knobs, five roses and two escutcheon designs to enhance any building style
- Levers constructed of solid brass or solid stainless steel for a strong-yet-comfortable feel
- Supports Schlage Conventional, FSIC and SFIC key cylinder formats plus a wide range of competitive cylinders
- Layered security key systems range from open and patented to restricted and geographically exclusive Primus options which include UL 437 high-security cylinders.



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A Detailed Look – L Mechanical



Beauty, Brawn & Flexibility

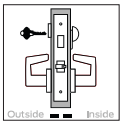
L Series mortise offers the greatest opportunity for customization to fit your needs. Featuring an extensive number of design choices, it's also the strongest, most secure mechanical lock in the Schlage portfolio.

- Several functions can be configured in push/pull or ligature-resistant trims
- Universal lock case design allows the L9050 function to be reconfigured into any of seven other functions
- 46 standard case mortise functions plus 6 small case mortise deadbolt functions
- 12 finishes plus two options for antimicrobial coating
- 33 ADA compliant lever options
- Available Vandlgard and/or key override feature options on several functions
- BAA compliant
- Locks are ANSI/BHMA Grade 1 certified
- Available with lead lining
- UL Listed 3-hour
- Perfectly suited to the LT Series tubular locks



Single Cylinder Deadbolt Functions

Schlage **ANSI**
L9473 **F21**



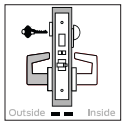
Dormitory/ bedroom lock



- Key cylinder outside; thumbturn inside; deadbolt and latchbolt
- Latchbolt retracted by lever (or knob) from either side at all times
- Deadbolt thrown or retracted by key outside or by inside thumbturn

Note: Hospital latch and ligature-resistant trims not available with Vandlgard option.

Schlage **ANSI**
L/LV9480 **-**
L/LV9480 with XL13-439



Storeroom lock with deadbolt

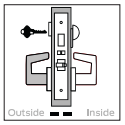


- Key cylinder outside; thumbturn inside; deadbolt, latchbolt and deadlocking auxiliary latch
- Outside lever (or knob) always fixed; latchbolt retracted by inside lever; Vandlgard® option allows outside lever to rotate freely down while locked
- Deadbolt thrown or retracted by key outside or by inside thumbturn
- Key outside retracts deadbolt and latchbolt, however, outside lever remains locked; XL13-439 option allows key to retract deadbolt and latchbolt overriding thumbturn if being held in locked position
- Rotating inside lever retracts both deadbolt and latchbolt
- Inside lever always free for immediate egress

Note: Ligature-resistant trims not available with Vandlgard option.

To order with key override, specify function and note XL13-439 as a special option.

Schlage **ANSI**
L/LV9485 **-**
L/LV9485 with XL13-439



Faculty/hotel restroom lock with deadbolt



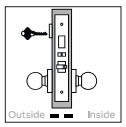
- Key cylinder outside; thumbturn inside; deadbolt, latchbolt and deadlocking auxiliary latch
- Outside lever (or knob) always fixed; latchbolt retracted by inside lever; Vandlgard® option allows outside lever to rotate freely down while locked
- Deadbolt thrown or retracted by rotating inside thumbturn
- Key outside retracts latchbolt but does not retract deadbolt unless using an emergency key (sold separately); XL13-439 option allows emergency key to retract deadbolt and latchbolt overriding thumbturn if being held in locked position
- Rotating inside lever retracts both deadbolt and latchbolt
- Inside lever always free for immediate egress

Note: Not available in SFIC or Everest SL formats.

Note: Hospital latch and ligature-resistant trims not available with Vandlgard option.

To order with key override, specify function and note XL13-439 as a special option.

Schlage **ANSI**
L9485 with XL11-557 **-**



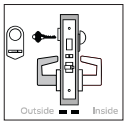
Prison function lock

- Key cylinder outside with knob; knob only-inside; deadbolt, latchbolt and deadlocking auxiliary latch
- Outside knob always free spinning; latchbolt retracted by inside knob
- Inside knob is made inoperative (fixed) when deadbolt is thrown by guard key outside
- Guard key outside retracts deadbolt and unlocks inside knob; in unlocked state use of prisoner's key outside retracts latchbolt only

Note: Available with knobs in rose or L escutcheon trim only. Tamper-resistant Torx screws standard.

To order, specify function and note XL11-557 as a special option.

Schlage **ANSI**
L/LV9486 **-**
L/LV9486 with XL13-439



Faculty/hotel restroom lock with chevron indicator



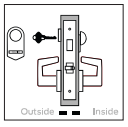
- Key cylinder outside; thumbturn inside; deadbolt, latchbolt and deadlocking auxiliary latch
- Outside lever (or knob) always fixed; latchbolt retracted by inside lever; Vandlgard® option allows outside lever to rotate freely down while locked
- Deadbolt thrown or retracted by rotating inside thumbturn, when thrown-indicator message changes from blank to "DO NOT DISTURB"
- Key outside retracts latchbolt but does not retract deadbolt unless using an emergency key (sold separately); XL13-439 option allows emergency key to retract deadbolt and latchbolt overriding thumbturn if being held in locked position
- Rotating inside lever retracts both deadbolt and latchbolt
- Inside lever always free for immediate egress

Note: Not available in SFIC or Everest SL formats. Hospital latch trim not available with Vandlgard option.

To order with key override, specify function and note XL13-439 as a special option.

Available with A, B or C roses only; to order chevron indicator with "OCCUPIED" message specify L583-375.

Schlage **ANSI**
L/LV9496 **-**
L/LV9496 with XL13-439



Corridor lock with chevron indicator

- Key cylinder outside; thumbturn inside; deadbolt and latchbolt
- Latchbolt retracted by lever (or knob) from either side
- Outside lever is made inoperative when deadbolt is thrown by key outside or by inside thumbturn, when thrown-indicator message changes from blank to "OCCUPIED"; Vandlgard® option allows outside lever to rotate freely down while locked
- Key outside retracts deadbolt and unlocks outside lever; XL13-439 option allows key to retract deadbolt overriding thumbturn if being held in locked position
- Rotating inside lever retracts both deadbolt and latchbolt and unlocks outside lever
- Inside lever always free for immediate egress

Note: Available in rose trim only.

To order with key override, specify function and note XL13-439 as a special option.

Adds chevron style occupancy indicator (09-611) to sectional trim lock with A or B roses only.

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SCHLAGE



ND Series

Grade 1 Cylindrical Locks

Mechanical | Wired Electrified | Wireless Electronic

SCHLAGE | ALLEGION

Commercial.Schlage.com

ND MECHANICAL



Applications

The ND Series' functional and trim offerings are the most expansive of the Schlage cylindrical lock portfolio. This extremely versatile lock is made to handle the abuses of heavy use in any commercial setting. Options include best-in-class lock status indication ideal for classroom security and ligature-resistant options for the healthcare market.

Because ND uses an ANSI door prep common across cylindrical locks, it is ideal for both new construction and retrofit upgrades.



Key Features

- Significantly exceeds ANSI/BHMA A156.2 requirements for Grade 1 cylindrical locks
- 25 mechanical functions plus eight that feature Vandlgard® locked lever protection
- Nine lever designs, two rose designs, status indication and ligature-resistant trim options
- Nine standard finishes, plus an antimicrobial coating option
- Supports Conventional, FSIC, and SFIC cylinder formats plus high-security UL 437 options
- Multiple key systems available – open, patented, restricted, and geographically exclusive
- Support for 10 non-Schlage cores (see cylinder section)

ND WIRED ELECTRIFIED



Applications

Electrified locks complement mechanical ND Series where wired electronic access control solutions are desired. They can be applied as part of a network or independently with a remote access switch such as may be used for a reception area.

Electrified ND locks are ideal for high-traffic areas where line power ensures continuous operation. They are most easily incorporated into new construction where electrified door prep, conduit hinges, and wiring is planned for the building.

Key Features

All mechanical features plus:

- Combines mechanical strength with the convenience of electronic access control
- Auto-detects 12V or 24V DC
- Selectable EL/EU operation
- Four electrified functions
- Low 0.24 amp max current draw allows multiple locks on a single power supply
- Low 0.01 amp holding current eliminates "hot levers" in electrically locked applications
- Modular Request-to-Exit (RX) can be added at any time

NDE WIRELESS ELECTRONIC



Applications

NDE mobile enabled wireless locks are designed to affordably extend electronic access control deeper into the building beyond traditional perimeter and high security openings.

The NDE is ideal for both commercial new construction and retrofit. Facilities can benefit from the enhanced security, efficiency, and convenience of upgrading to electronic credentials.

Key Features

All mechanical features[1] plus:

- Interior push button with indication for storeroom, office, privacy and apartment functionality
- Compatible with Bluetooth, NFC, smart, or proximity credentials
- Integrated credential reader, door position sensor, and request-to-exit (RX) switch
- Built-in Bluetooth® enables wireless configuration from smart phones/tablets
- Functions in offline or No-Tour mode or as a networked lock with either periodic check-ins or real-time management
- Up to 2 years of battery life

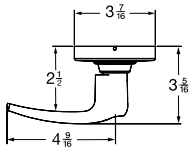
1. NDE wireless electronic is not available in 613 finish.

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NORTH OAKVILLE #3 HCDSB

Lever Designs & Finishes

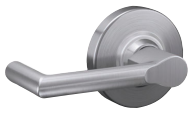
Athens (ATH)

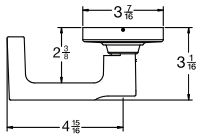




Cores *KIL, FSIC, SFIC, L-CO, L-SA, J-CO6, J-ME, J-SA, J-YA6*

Boardwalk (BRK)[1]

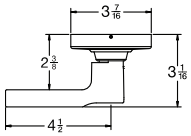




Cores *KIL, FSIC, SFIC*

Broadway (BRW)

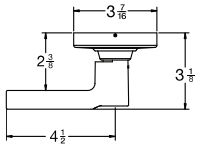




Cores *KIL, FSIC, SFIC*

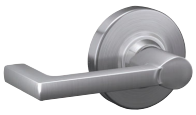
Latitude (LAT)

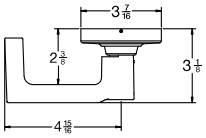




Cores *KIL, FSIC, SFIC*

Longitude (LON)[1]

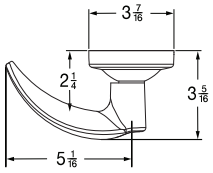




Cores *KIL, FSIC, SFIC*

Omega (OME)[1]

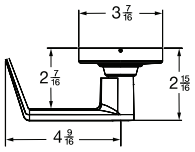




Cores *KIL, FSIC, SFIC*

Rhodes (RHO)[1]

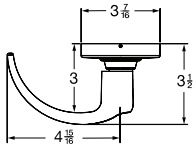




Cores *KIL, FSIC, SFIC, L-CO, L-SA, J-CO6, J-CO7, J-ME, J-SA, J-YA6, J-YA7*

Sparta (SPA)[1]

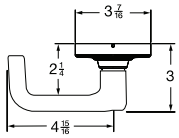




Cores *KIL, FSIC, SFIC, L-CO, L-SA, J-CO6, J-ME, J-SA, J-YA6*

Tubular (TLR)[1]





Cores *KIL, FSIC, SFIC, L-CO, L-SA, J-CO6, J-ME, J-SA, J-YA6*

Finishes



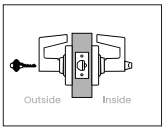
605 Bright Brass	606 Satin Brass	612 Satin Bronze	613[2] Oil Rubbed Bronze	619 Satin Nickel	622 Matte Black	625 Bright Chrome	626/626AM Satin Chrome/ Antimicrobial	630[3] Satin Stainless Steel	643e Aged Bronze

1. Boardwalk, Longitude, Omega, Rhodes, Sparta, and Tubular levers comply with California state code for return within 1/2" of door face.
2. NDE wireless electronic locks not available in 613 finish.
3. Available on HSLR trim only.

Mechanical Lock Functions

Keyed Functions

Schlage **ND53** — **ANSI** **F109**



Entrance lock

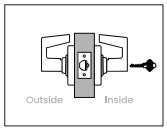


- Lever with key cylinder outside; push/turn button in lever inside; deadlatch
- In unlocked state latch is retracted by either lever
- Outside lever is made inoperative by pushing button or pushing and turning button on inside lever; key outside does not lock
- **Pushed button unlocking:** key outside or rotating inside lever retracts latch and releases button unlocking outside lever
  Pushed/turned button unlocking: key outside or rotating inside lever retracts latch but does not unlock outside lever; rotate inside button to start position to allow button release and unlocking by key or by rotating inside lever
- Inside lever always free for immediate egress

Caution: Egress without fully releasing the push/turn button can result in lock-out situations.

Note: Locks ordered with indicator trim fit 1-3/4" doors. Sold separate spacer kits allow application to doors 1-3/8" to 1-11/16".

Schlage **ND60 with XN12-001** — **ANSI** **-**

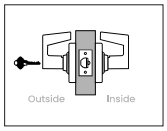


Vestibule lock with interior unlocking only

- Lever outside; lever with key cylinder inside; deadlatch
- In unlocked state latch is retracted by either lever
- Outside lever is locked or unlocked by key inside
- Inside lever always free for immediate egress

To order, specify function and note XN12-001 as a special option.

Schlage **ND70** — **ANSI** **F84**

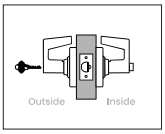


Classroom lock, exterior lockdown only



- Lever with key cylinder outside; lever inside; deadlatch
- In unlocked state latch is retracted by either lever
- Outside lever is locked or unlocked by key outside
- Inside lever always free for immediate egress

Schlage **ND73** — **ANSI** **F90**

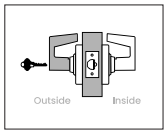


Corridor lock



- Lever with key cylinder outside; push button in lever inside; deadlatch
- In unlocked state latch is retracted by either lever
- Outside lever is made inoperative by pushing button on inside lever or by key outside
- **When locked by pushed button:** rotating inside lever retracts latch and releases button unlocking outside lever; closing door also unlocks preventing lock-out
  When locked by key: rotating inside lever retracts latch but outside lever remains fixed until unlocked by key outside
- Inside lever always free for immediate egress

Schlage **ND80** — **ANSI** **F86**



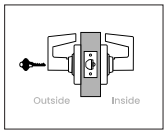
Storeroom lock



- Lever with key cylinder outside; lever inside; deadlatch
- Outside lever always fixed; latch retracted by inside lever
- Key in outside lever retracts latch only
- Inside lever always free for immediate egress

To order configured with Request to Exit (RX), specify RX under special options.

Schlage **ND81** — **ANSI** **F86**



Accessible storeroom lock



- Lever with key cylinder outside; lever inside; deadlatch
- Outside lever is always fixed when key is not present; latch retracted by inside lever
- Key outside turned counter-clockwise retracts latch; 180-degree clockwise rotation of key allows outside lever to retract latch
- Inside lever always free for immediate egress

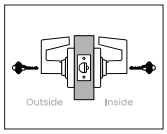
To order configured with Request to Exit (RX), specify RX under special options.

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Mechanical Lock Functions

Keyed, Double Cylinder Functions

Schlage **ANSI**
ND60 **F88**



Vestibule lock

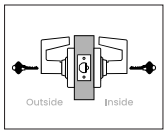


- Lever with key cylinder both sides; deadlatch
- In unlocked state latch is retracted by either lever
- Outside lever is made inoperative by key inside; key outside does not lock
- Key outside retracts latch but cannot unlock outside lever; only key inside unlocks
- Inside lever always free for immediate egress

Note: Available with optional instruction rose identifying key rotation direction for rapid lockdown. 626 finish only.

To order with instruction rose specify function and note XN12-035 as a special option.

Schlage **ANSI**
ND66 **F91**



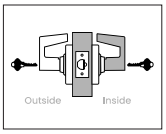
Store lock



- Lever with key cylinder both sides; deadlatch
- In unlocked state latch is retracted by either lever
- Key in either lever locks or unlocks both levers

Caution: Double cylinder locks on any door, in any structure which is used for egress are a life safety hazard in times of emergency and their use is not recommended. Installation should be in accordance with existing codes only.

Schlage **ANSI**
ND70 x 80 **-**

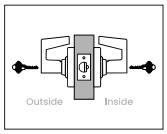


Classroom by storeroom lock

- Lever with key cylinder both sides; deadlatch
- In unlocked state inside lever is always fixed; latch retracted by outside lever
- Outside lever is locked or unlocked by key outside; key inside retracts latch but does not unlock either lever

Caution: Double cylinder locks on any door, in any structure which is used for egress are a life safety hazard in times of emergency and their use is not recommended. Installation should be in accordance with existing codes only

Schlage **ANSI**
ND72 with XN12-002 **F80**



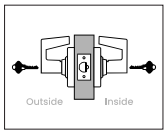
Communicating lock

- Lever with key cylinder both sides; deadlatch
- In unlocked state latch is retracted by either lever
- Key in either lever makes inoperative only that lever
- Key in either lever retracts the latch and unlocks only that lever

Caution: Double cylinder locks on any door, in any structure which is used for egress are a life safety hazard in times of emergency and their use is not recommended. Installation should be in accordance with existing codes only.

To order, specify function and note XN12-002 as a special option.

Schlage **ANSI**
ND72 with XN12-003 **F80**



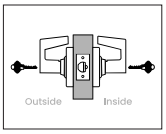
Vandlgard® communicating lock

- Lever with key cylinder both sides; deadlatch
- In unlocked state latch is retracted by either lever
- Key in either lever makes inoperative only that lever; Vandlgard® allows locked lever to rotate freely when locked
- Key in either lever retracts the latch and unlocks only that lever

Caution: Double cylinder locks on any door, in any structure which is used for egress are a life safety hazard in times of emergency and their use is not recommended. Installation should be in accordance with existing codes only.

To order, specify function and note XN12-003 as a special option.

Schlage **ANSI**
ND78 **F110**



Classroom security lock (180-degree lockdown)



- Lever with key cylinder both sides; deadlatch
- In unlocked state latch is retracted by either lever
- Outside lever is made inoperative by rotating key in either lever 180 degrees counter-clockwise and returning to start position
- Unlock outside lever by rotating key 180 degrees clockwise in either lever and returning to start position
- Inside lever always free for immediate egress

Locks ordered in 626 finish come standard with instruction rose (47342586) identifying key rotation direction for rapid lockdown. Other finishes receive a standard rose.

Note: Locks ordered with indicator trim fit 1-3/4" doors. Sold separate spacer kits allow application to doors 1-3/8" to 1-11/16".

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2150 Winston Park Drive, Unit 16
Oakville, L6H 5V1
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Device types

33A/35A Rim exit device



33A and 35A for all types of single and double doors with mullion, UL listed for panic exit hardware. Devices are ANSI A156.3 – 2014 Grade 1. The 35A has a smooth mechanism case and the 33A has grooved case. The rim device is non-handed except when the SS (signal switch) option is used.

33A/35A fits door stiles as narrow as 1 3/4" (44mm). Newly designed device has a one piece center case cover.

Specifications

Device lengths	3' 2'4' to 3' (711mm to 914mm) Door size 4' 2'10" to 4' (864mm to 1219mm) Door size
Device centerline from finished floor	39 13/16" (1011mm) 39 11/16" (1008mm) with mullion
Center case	8 3/16" x 1 9/16" x 2 13/32" (208mm x 40mm x 62mm)
Mechanism case	2 1/4" x 2 1/4" (57mm x 57mm)
Projection	Pushbar neutral – 3 13/16" (97mm) Pushbar depressed – 3 1/16" (78mm)
Latch bolt	Deadlocking, 3/4" (19mm) throw
Finishes	605, 606, 612, 619 (35A only), 625, 626, 626AM, 628, 710, 711
Fasteners and sex bolts (SNB)	Includes screw pack for 1 3/4" (44mm) and 2 1/4" (57mm) wood and metal doors #425 SNB furnished standard for end case #325 SNB furnished standard for EO (exit only device)

Accessories



1439 roller
Ships standard, optional strikes available



299 strike
Needs to be specified for hollow metal frames



Hex key dogging
Comes standard on 33A/35A rim exit devices

Features and options

Electrified options

ALK	Alarm exit kit
CX	Chexit delayed exit
ESL	Emergency secure lockdown
LX	Latch bolt monitor switch
LX-RX	Request to exit / latch bolt monitoring
QEL	Quiet electric latch retraction
RX	Request to exit, WP-RX waterproof option
RX-LC, LX-LC, LX-RX-LC	Low current option for RX, LX, LX-RX
SS	Signal switch
CON	Allegion Connect

Mechanical options

AX	Accessible device
GBK	Glass bead kit
PN	Pneumatic
QM	Quiet mechanical
SEC	Security screws
SG	Safety glow
SNB	Sex bolts
WH	Weep holes

Dogging feature
Hex key dogging standard

Dogging options

CD	Cylinder dogging
CDSI	Cylinder dogging with security indicator
HDSI	Hex dogging with security indicator
LD	Less dogging

Strikes

1439	Dull black

Optional strikes

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No trim, 386 and 388 trim





Trim description	No trim	386 trim		388 trim
Nomenclature	EO	386DT	386NL	388
Trim function	No outside trim	Dummy trim	Night latch	Night latch
Function description	Exit only	Pull when dogged	Key retracts latch bolt	Key retracts latch bolt optional pull required
ANSI function	01	02	03	03
Device compatibility				
33/35A rim	■	■	■	■
33/35 A Rim-F	■		■	■
33/3527A	■	■	■	■
33/3527A-F	■		■	■
33/3547A	■	■	■	■
33/3547A-F	■		■	■
33/3548A	■	■	■	■
33/3548A-F	■		■	■
33/3549A	■	■		
33/3549A-F	■			
33/3550A	■	■		
33/3550A-F	■			
Handing				
	—	—	Handed	—
Cylinder type				
Rim or vertical device	—	—	Rim	Rim
Mortise lock device	—	—	—	—

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Push pads

Dummy push pad



The 330 dummy pushpad is designed as a companion unit for all 33A devices. The 350 dummy pushpad is a companion unit for all 35A devices. The pushpad is rigid or nonfunctioning. A push/pull operation can be accomplished by using 386DT, 360L-DT, 550DT, 392-6 trim or any Ives pull.

The 330/350 can be equipped with a functional pushpad and will accommodate an RX switch. Specify RX-330. May also be equipped with the RX2, double RX switch. Specify RX2-330.

To order, specify:

1. 330 or 350
2. Size 3' or 4' (914mm or 1219mm)
3. Finish – 605, 606, 612, 625, 626, 628, 710 and 622/711 (630–350 only)

Safety glow (SG)



Self-illuminating touchpad defines the location of the exit door in dark or smoke-filled area. The Safety Glow coating is a special powder coat finish that glows brightly during low or no light conditions. This coating was developed to meet MEA standards where luminescent exit door markings are required in commercial facilities. There are no batteries or electronics, the coating is charged when exposed to light.

To order, specify: Suffix SG, EL 33A27A-SG

Red silk screen (RSS)



Red silkscreen lettering on touchpad trim. "Emergency Exit Only, Push To Open And Sound Alarm." This comes standard on SS devices.

To order, specify: Suffix RSS, 33A27L-RSS RHR

Braille, embossed and knurled touchpads



* Image shown is a special order.

Braille touchpad embossed with the standard message “CAUTION STAIRWELL” in braille and raised letters provides assistance to persons with impaired vision. Letters are ½" (13mm) high and braille is #2, raised height is 3⁄32" (2mm). Other messages are available on special order, limited to 20 characters per line.*

To order, specify: Suffix BR, EL33A27L-BR

Embossed touchpad is embossed with the word “PUSH”.

To order, specify: Suffix EMB, EL33A27L-EMB

Knurled touchpad is to provide warning to persons with impaired vision.

To order, specify: Suffix PBKN, EL33A27L-PBKN

* Consult factory for availability.

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Device types

98/99 Rim exit device



98 and 99 rim exit devices for all types of single and double doors with mullion, UL listed for panic exit hardware. Devices are certified to ANSI/BHMA A156.3 2014, Grade 1. The 98 device has a smooth mechanism case and the 99 device has a grooved case. The rim device is non-handed except when the following device options are used: SD (special dogging), -2 (double cylinder) or SS (signal switch). Covers stock hollow metal doors with 86 or 161 cutouts on single doors (may cover cutouts on pairs – consult template).

Specifications

Device functions	Device ships EO/DT/NL; Field selectable; For TP, K or L remove NL drive screw from device
Device lengths	3' 2'4' to 3' (711mm to 914mm) Door size 4' 2'10" to 4' (864mm to 1219mm) Door size
Device centerline from finished floor	39 13/16" (1011mm) 39 11/16" (1008mm) with mullion
Center case	8" x 2 3/4" x 2 3/8" (203mm x 70mm x 60mm)
Mechanism case	2 1/4" x 2 1/4" (57mm x 57mm)
Projection	Pushbar neutral – 3 13/16" (97mm) Pushbar depressed – 3 1/16" (78mm)
Latch bolt	Deadlocking, 3/4" (19mm) throw
Finishes	605, 606, 612, 625, 626/626AM, 628, 710, 711 and 643e (619 and 630 available with 98 Series only)
Fasteners and sex bolts (SNB)	Includes screw pack for 1 3/4" (44mm) and 2 1/4" (57mm) thick metal or wood doors (Optional 425 SNB available, see page 66 for quantities)

Accessories



299 Strike
Ships standard,
optional strikes available.



Hex key dogging
Comes standard on
98/99 rim exit devices.

Features and options

Electrified options

LX	Latch bolt monitor switch
RX	Request to exit
RX2	Double request to exit
E	Electric locking and unlocking trim
EL	Electric latch retraction
ESL	Emergency secure lockdown
QEL	Quiet electric latch retraction
SS	Signal switch
CX	Chexit delayed exit
ALK	Alarm exit kit
WP-RX	Waterproof request to exit
CON	Allegion Connect

Mechanical options

-2	Double cylinder
-2SI	Double cylinder with security indicator
AX	Accessible device
GBK	Glass bead kit
PN	Pneumatic latch retraction
QM	Quiet mechanical
SNB	Sex bolts
SEC	Security screws
WH	Weep holes
XP	Extra protection

Dogging feature
Hex key dogging standard

Dogging options

CD	Cylinder dogging
CD-CX	Chexit cylinder dogging
CDSI	Cylinder dogging with security indicator
HDSI	Hex dogging with security indicator
SD	Special center case dogging
LD	Less dogging
DI	Dogging indicator
CI	Cylinder dogging indicator

Strikes
299 – Dull black

98-F/99-F Rim exit device



98-F and 99-F Rim fire exit devices are certified to ANSI/BHMA A156.3 2014, Grade 1 and UL listed for fire exit hardware. See page 69 for detailed information on UL fire exit hardware label and door opening size information. The 98-F device has a smooth mechanism case and the 99-F device has a grooved case. The rim device is non-handed except when the following device options are used: -2 (double cylinder) or SS (signal switch).

Specifications

Device functions	Device ships EO/DT/NL; Field selectable; For TP, K or L remove NL drive screw from device
Device lengths	3' 2'4" to 3' (711mm to 914mm) Door size 4' 2'10" to 4' (864mm to 1219mm) Door size
Device centerline from finished floor	39 13/16" (1011mm) 39 11/16" (1008mm) with mullion
Center case	8" x 2 3/4" x 2 3/8" (203mm x 70mm x 60mm)
Mechanism case	2 1/4" x 2 1/4" (57mm x 57mm)
Projection	Pushbar neutral – 3 13/16" (97mm) Pushbar depressed – 3 1/16" (78mm)
Latch bolt	Deadlocking, 3/4" (19mm) throw
Finishes	605, 606, 612, 626/626AM, 628, 710, 711 and 643e (619 and 630 available with 98 Series only)
Fasteners and sex bolts (SNB)	Includes screw pack for 1 3/4" (44mm) and 2 1/4" (57mm) thick metal or wood doors; Optional 425 SNB available for metal doors; 425 and 825 SNB required on wood doors without SLM blocking (See page 66 for quantities)

Accessories



299F Strike
Ships standard, optional strikes available



499F Strike
With 9854/9954 mullion

Features and options

Electrified options

LX	Latch bolt monitor switch
RX	Request to exit
RX2	Double request to exit
E	Electric locking and unlocking trim
EL	Electric latch retraction
ESL	Emergency secure lockdown
QEL	Quiet electric latch retraction
SS	Signal switch
CX	Chexit delayed exit
ALK	Alarm exit kit
WP-RX	Waterproof request to exit
CON	Allegion Connect

Mechanical options

-2	Double cylinder
-2SI	Double cylinder with security indicator
AX	Accessible device
GBK	Glass bead kit
PN	Pneumatic latch retraction
QM	Quiet mechanical
SNB	Sex bolts
SEC	Security screws
SLM	Special laminate material blocking
WH	Weep holes
XP	Extra protection

Dogging option
No mechanical dogging;
QEL options available

Strikes
299F – Dull black, 499F with mullions

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Trim options

996 trim



Trim description					
Nomenclature	996EO	996L*	996L-NL*	996L-BE*	996L-DT
Trim function	Exit only plate	Lever	Lever-night latch	Lever-blank escutcheon	Lever-dummy trim
Function description	Exit only plate	Key locks and unlocks	Key retracts latch bolt	Always operable, no cylinder	Pull when dogged
ANSI function	01	08	03	14	02
Device compatibility					
98/99 Rim/Rim-F	■	■	■	■	■
XP98/XP99 Rim/Rim-F	■	■	■	■	■
98/9927/27-F	■	■	■	■	■
98/9947/47-F	■	■	■	■	■
98/9947WDC/WDC-F	■	■	■	■	■
98/9948/48-F	■	■	■	■	■
98/9949/49-F	■	■	■	■	■
98/9950WDC/50WDC-F	■	■	■	■	■
98/9952†	†	†	†	†	†
98/9957/57-F	■	■	■	■	■
98/9975/75-F	■	■	■	■	■
Dimensions					
Escutcheon plate size	2 3/4" x 10 3/4" x 27/32" (70 x 273 x 21mm)				
Pull center to center	—	—	—	—	—
Projection	—	2 7/8" (73mm)	2 7/8" (73mm)	2 7/8" (73mm)	2 7/8" (73mm)
Handing					
	—	Handed/reversible	Handed/reversible	Handed/reversible	Handed/reversible
Cylinder type					
Rim or vertical device	—	Rim	Rim	—	—
Mortise lock device	—	1 1/4" mortise	1 1/4" mortise	—	—

* Specify R/V if used for rim and vertical devices, M for mortise device. Example, 996L-R/V or 996L-M.

† Default trim is 252L /L-BE. Must be ordered as EO when paired with other trims (ordered separately).

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Mullions

Removable steel mullions Mullions provide single door performance in double door openings with rim devices. Mullions are easily removed by loosening bottom set screw and removing top fitting cover. The top mullion fitting is attached to the frame and is concealed by the fitting cover.

Steel mullions are 2" (51mm) wide and 3" (76mm) deep, with a wall thickness of ⅛" (3mm).

Mullions are shipped with mounting screws and prepared for strikes. Strikes are not included except where indicated.

Steel mullions are available in SP28 and SP313 finishes. Consult factory for other powder coat finish options.

KR – Keyed removable steel mullions makes removal faster and easier by a single operation of the mortise cylinder. Once mullion is removed, large equipment or furniture can freely pass through the opening. The unit will self lock when re-installed, without use of the cylinder key. Uses a 1 ¼" mortise cylinder with a straight cam (Schlage cam reference B502-191). Cylinders are sold separately. Prefix mullion model with "KR".

Removable aluminum mullions are 1 1⁄16" (27mm) wide on face closest to the door and 2 ⅜" (60mm) at the widest point. The depth is 3 ⅛" (79mm) with a wall thickness of ⅛" (3mm).

Aluminum mullions are available in US4, US10, US28, 313 and 315 finishes. Consult factory for other powder coat finish options.

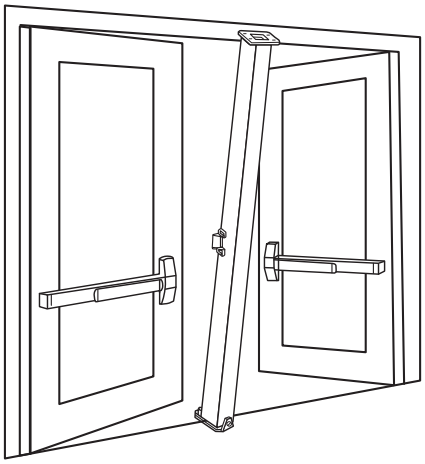
Stock hollow metal applications for devices mounted to cover ANSI 161 cutouts are higher than the standard mullion strike location. Consult the factory for special strike preparation or order a blank mullion. See below.

Blank mullions are furnished without strike preparation. They are used to mount devices at a strike height different from the standard mullion preparation.

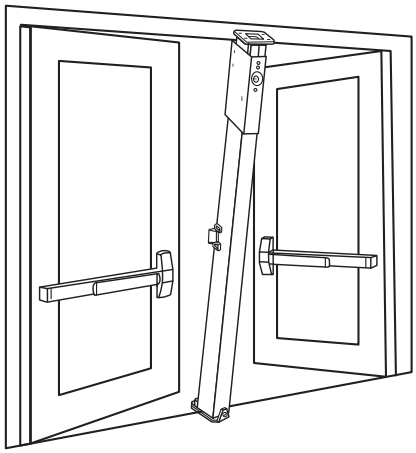
To order, specify:

1. For keyed removable option on steel mullions, prefix model number with "KR"
2. Model number
3. Height of opening
4. Finish
5. Handing if required
6. Centerline deviation (refer to device template for standard centerline)
7. Strikes, when required, should be ordered with device
8. For keyed Removable option on steel mullions, prefix model number with "KR"

Removable mullions



Keyed removable steel mullions



Steel mullions

1654 Prepared for two 1606 strikes. **If 1606 strikes are not specified on the order, two per mullion will be added. Additional charges apply.**

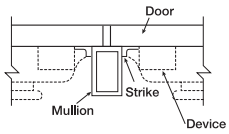
4954 Prepared for 264 or 299 strikes. For use with all Von Duprin Panic rim devices. **Note:** Specify strike choice with device.

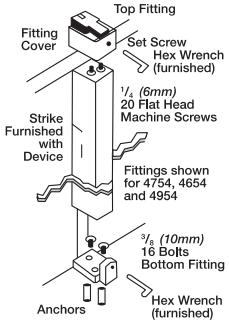
9954 Prepared for and must be used with two 268 strikes (88-F device), or two 499F (22-F, 98-F, 99F devices). UL fire labeled mullion for up to 3 hour opening using Von Duprin fire exit rim devices. This mullion is not easily removed due to special fittings.

22-F and 88-F devices are rated up to 8' x 8" (2438mm x 2438mm).

98-F and 99-F devices are rated up to 10'0" (3048mm).

Note: If 268 or 499F strikes are not specified on the order, two per mullion will be added. Additional charges apply.

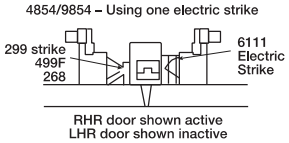




4754 Prepared for two 4263 monitor strikes.

4854 Prepared for one 299 and one 6111 electric strike. Indicate handing for electric strike.

9854 Prepared for one 268 or 499F strike and one 6111 electric strike. Indicate handing for electric strike. UL fire labelled mullion for up to 3 hour openings up to 8' x 8' (2438mm x 2438mm) using Von Duprin Fire Exit Rim Devices.



Aluminum mullions

5654 Prepared for two 264 or 299 strikes with weatherstripping. Includes one set of 154 stabilizers.

5754 Prepared and furnished with one 1408 double door strike. Includes one 154 stabilizer set. Note: specify device "less strike".

Sizes for mullions

1654, 4954, 4754, 4854, 5654	9854, 9954
7' 2" (2184mm)	7' 3" (2210mm)
*8' 2" (2489mm)	8' 3" (2475mm)
*10' 2" (3099mm)	10' 3" (3124mm)
KR1654, KR4954, KR4754, KR4854	**KR9854**, KR9954***
7' 6" (2286mm)	7' 5" (2261mm)
8' 6" (2591mm)	*8' 5" (2565mm)
10' 6" (3200mm)	*10' 5" (3175mm)

* Only qualifying applications will be provided with UL Label.
** Fire rated same as 9854
*** Fire rated same as 9954



Angle plate is used with narrow transom frames. The plate attaches to the transom extending the surface area needed to mount the mullion. Must be ordered separately. Specify finish.

154 Stabilizer is a two-piece interlocking set. One piece mounts on the mullion with the top mounting hole 5 3⁄16" (148mm) below the centerline of the strike; the other piece mounts on the door. Shims are provided to adjust for misalignment between the door and mullion.



The set maintains integrity between the door and mullion to prevent vandalism and to ensure contact between the device and strike as the doors expand and contract with temperature changes.

Furnished standard on aluminum mullions; optional for steel and all blank steel mullions.

MT54 Storage kit is a set of floor and wall brackets that provide convenient storage of the keyed removable mullion when removed from the opening.

To order, specify

1. Model MT54
2. Finish SP28, SP313, or SPBLK

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6200 Series strikes for mortise or cylindrical devices

Overview
Von Duprin electric strikes are known for their reliability, durability and security. The 6200 Series is designed to withstand abuse. Its heavy-duty stainless steel construction is fully UL1034 and UL10C listed.

6200 Series electric strikes are designed for use with a variety of mortise or cylindrical locksets. It interfaces with the latch mechanism of the exit device. The 6200 Series movable lip (keeper) allows a door to open, even when the latch bolt is extended. This feature, called remote release provides added benefits such as increased convenience and efficiency. The 6200 Series also provides added security and traffic control.

6200 Series electric strikes can be used for retrofit applications or new construction. To assure the proper selection of an electric strike on new applications, lockset compatibility charts are shown below. When using a lockset not listed or when retrofitting a strike to an existing application, please contact Von Duprin Technical Support for application assistance.



Features and benefits

- Non handed design provides greater flexibility
- Strike box is adjustable to compensate for misalignment of the door or frame
- Two piece plug connectors are furnished for ease of installation and for removal during strike servicing
- UL1034 Burglary-Resistant and UL10C Electric Strike for Fire Door
- Six finishes available to suite with existing hardware
- Durable stainless steel construction
- 24 VDC standard with 12 VDC and AC operation optional

6200 Series power requirements

Models	Voltage	Current	Duty	Amps	Ohms
All	12V	DC	Continuous	0.60	21
All	16V	DC	Continuous	0.40	38
All	24V	DC	Continuous	0.33	83
All	28V	DC	Continuous	0.25	111

Continuous duty = Energized 1 minute or more

Cylindrical lockset compatibility[1,2,3]

6211, 6211AL, 6211WF, 6212, 6213, 6214, 6215, 6221, 6222, 6223, 6224, 6224AL, 6225 and 6226 Strikes

Manufacturer	Cylindrical latchbolt projection
Baldwin	1/2" – 3/4" (13mm – 19mm)
Best	3/8" – 3/4" (10mm – 19mm)
Corbin	1/2" – 3/4" (13mm – 19mm)
Falcon	1/2" – 3/4" (13mm – 19mm)
Russwin	1/2" – 3/4" (13mm – 19mm)
Sargent	1/2" – 3/4" (13mm – 19mm)
Schlage	3/8" – 3/4" (10mm – 19mm)
Yale	1/2" – 3/4" (13mm – 19mm)

Mortise lockset compatibility[1,2,3]

6211, 6211AL, 6211WF, 6212, 6213, 6214, 6215, 6221, 6222, 6223, 6224, 6224AL, 6225 and 6226 Strikes

Manufacturer	Model number
Von Duprin	7500
Adams Rite	4510, 4710
Baldwin	6000
Best	24H, 30H
Corbin	9000
Falcon	M2300, M2500, M2600, M3300, M3500, M3600
Precision	Mortise
Russwin	Mortise
Sargent	7700, 8100, 9000
Schlage	L9000, K30, K40, K50, K60
Yale	7030, 7130, 8600, 8700

Mortise lockset compatibility[1,3]

6210

Manufacturer	Model number
Von Duprin	7500
Best	30H (not 45H/47H)
Corbin/Russwin	ML2200, 5000, 9000, CR2200 (not 2000)
Falcon	M100, M200, M300, M400, M500, M600
Sargent	7700, 8100 (not 7800/8200)
Schlage	L9000
Yale	8700 (not 8800)

1. Von Duprin cannot guarantee compatibility as other manufacturer's designs may change without notice.
2. Signalling may not function when using 3/8" (10mm) throw bolt. Deadlocking cannot be guaranteed with all locks.
3. When using a lockset not listed or when retrofitting a strike to an existing application, please contact Von Duprin Technical Support for assistance.

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6300 Series surface mounted strike for rim exit devices

Overview
Von Duprin electric strikes are known for their reliability, durability and security. The 6300 Series is designed to withstand abuse. Its heavy-duty stainless steel construction is fully UL1034 and UL10C Listed.

6300 Series electric strikes are designed for use with a variety of rim devices. It interfaces with the latch mechanism of the exit device. The movable lip (keeper) allows a door to open even when the latch bolt is extended. This feature, called remote release, provides added benefits such as increased convenience and efficiency. The 6300 Series also provides added security and traffic control.

6300 Series electric strikes are ideal for aftermarket applications. It is easy to install without modifying or altering the door frame. To assure the proper selection of an electric strike on new applications, lockset compatibility charts are shown on the next page. When using a lockset not listed or when retrofitting a strike to an existing application, please contact Von Duprin technical support for application assistance.

The 6300 is fail-secure (FSE) only to achieve compliance with UL10C for fire-rated openings. In a fail-secure application, the door is normally locked. To unlock the door, power must be applied. The 6300 strike can be used with either 12VDC or 24VDC. There are 2 connectors that ship with it and the appropriate connector for either 12VDC or 24VDC will be used, based upon the available voltage at the opening.

Features and benefits

- Non-handed design provides greater flexibility
- Requires no alteration or cutting to existing frame
- UL1034 burglary-resistant and
- UL10C electric strike for fire door
- Stainless steel (satin) finish
- Durable stainless steel construction
- Field selectable voltage 12VDC or 24VDC
- Dynamic strength 70 ft-lbs
- Endurance 2,000,000 cycles

6300 Series power requirements

Model	Voltage	Current	Duty	Amps	Ohms
6300	12V	DC	Continuous	0.50	22
6300	24V	DC	Continuous	0.24	89



Rim exit device compatibility 6300 strikes

Manufacturer	Model Number
Von Duprin	VD 22/22-F Rim
Von Duprin	VD 33A/35A Rim*
Von Duprin	VD 55 Rim
Von Duprin	VD 88 Rim
Von Duprin	VD 98/99 and 98/99-F Rim
Falcon	Falcon 24/24-F Rim*
Falcon	Falcon 25/25-F Rim
Falcon	Falcon 19/19-F Rim
Falcon Doromatic	Falcon Doromatic 1590*
Falcon Doromatic	Falcon Doromatic 1790*
Falcon Doromatic	Falcon Doromatic 2090*

* Stile and frame condition may affect compatibility.

Model specifications

Model number	6300
Retrofits model	N/A
Latchbolt throw	3/4"
Face plate length	9"
Projection	3/4"
Lockset	Rim exit device
Number of doors	Single or pair with mullion
Door/frame type	Hollow metal, aluminum and wood
EB (entry buzzer)	Optional
Certifications	UL1034, UL10C, UL 294, CSFM
Application notes	Surface mounted electric strike ideal for aftermarket applications. Strike designed for use with Von Duprin 98/99, however it can be used with most rim exit devices.

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Solutions and specialty products

Finger guards



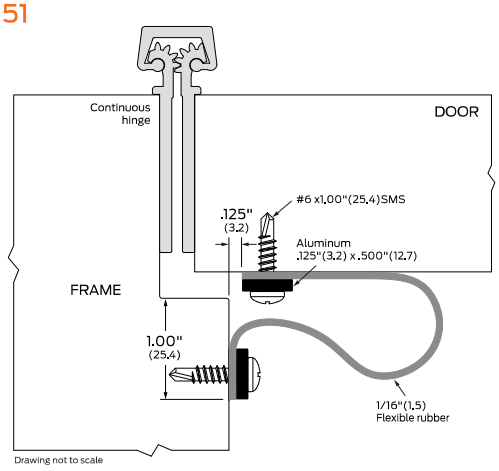
Finger guards

Hand and finger protection for heavy-duty industrial applications, child care, school safety, hospitals, and workplaces.

A commercial-quality, maintenance-free product. Aluminum and flexible rubber available in grey color.

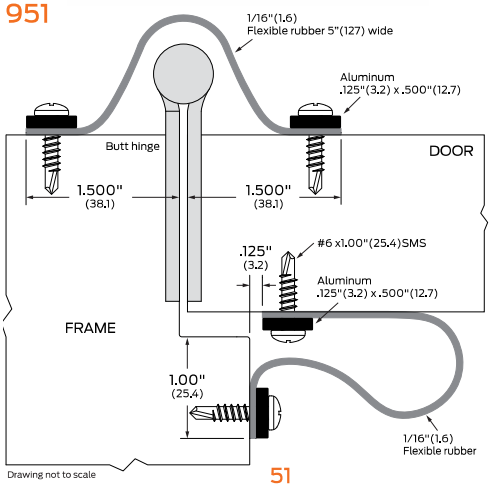
51A-90 (6.5" wide) For door opening up to 90°
51A-180 (8.5" wide) For door opening up to 180°
951 Cover for mortise type hinges

51



Finishes: A, BK, D, G
Options: SEC
Opening degree: 90, 180

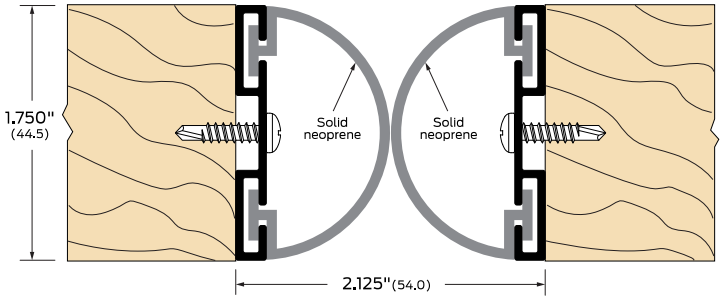
951



51

Finishes: A, BK, D, G
Options: SEC

72





Finishes: A
Options: SEC

Finishes:

A	Aluminum Mill Finish
BK	Black Anodized Aluminum
D	Dark Bronze Anodized Aluminum
G	Gold Anodized Aluminum

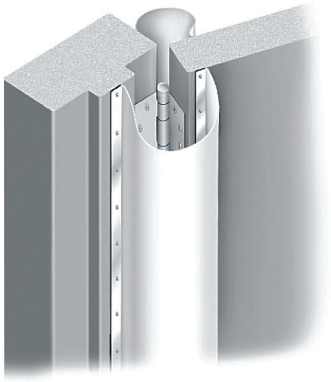
Options:

SEC	Torx security screws

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Solutions and specialty products

Finger guards



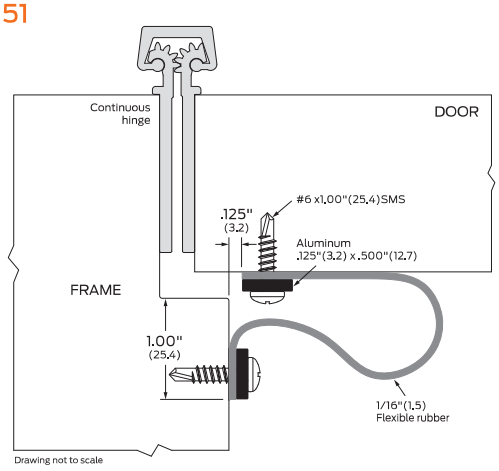
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Aluminum and flexible rubber available in grey color.

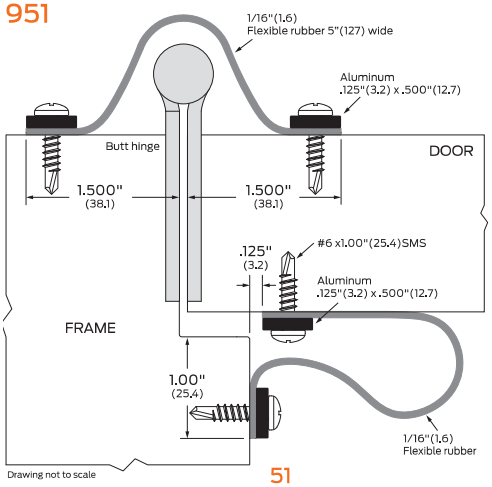
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951 Cover for mortise type hinges

51



Finishes: A, BK, D, G
Option: SEC
Opening degree: 90, 180

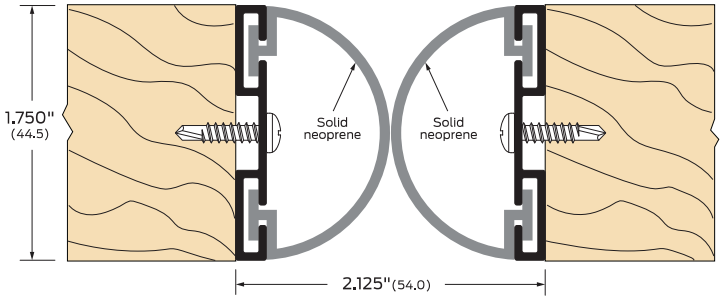
951



51

Finishes: A, BK, D, G
Option: SEC

72





Finishes: A
Option: SEC

Finishes:

A	Aluminum Mill Finish
BK	Black Anodized Aluminum
D	Dark Bronze Anodized Aluminum
G	Gold Anodized Aluminum

Option:

SEC	Torx security screws

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GT710/8710

Low-Energy
ADA Swing Door Operator

Where SOLUTIONS are AUTOMATIC



Product Features and Benefits

- Hydraulic design offers **proven reliability**
- Adjustable closing speeds to **enhance energy savings**
- Manual mode requires very little pressure to open **promoting ease of operation**
- Approved on fire door assemblies rated up to 3 hours, **maintaining security and safety**
- Hydraulic back-check during windy conditions **protects the door and operator from damage**

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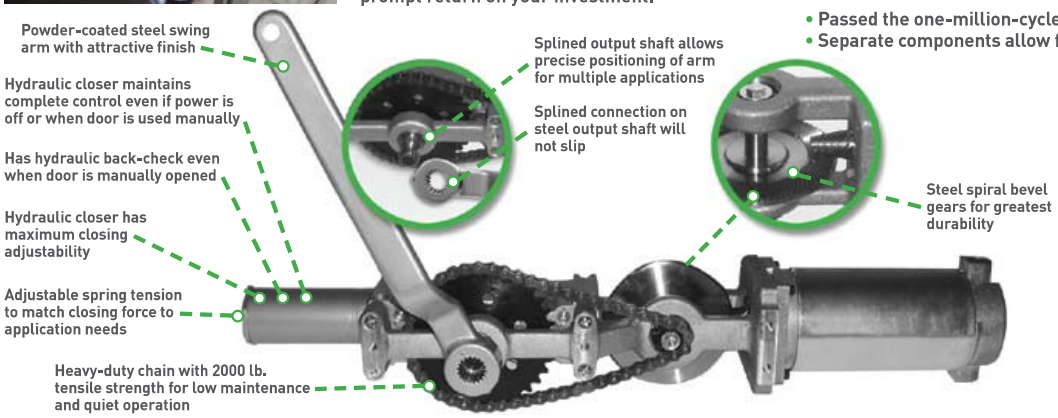
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GT710/8710 Low-Energy ADA Swing Door Operator

The NABCO GT710/8710 Low-Energy Operator is engineered for interior and exterior use, and designed to automate essentially any new or existing door frame. The GT710/8710 operates in both automatic and manual modes with a hydraulic back-check that protects the door and mechanical operator from damage when forced open in windy conditions or when manually operated. The GT710/8710 Operator has been approved for use on fire door assemblies rated up to 3 hours. The low-energy performance, combined with the adjustable opening and closing speeds, reduces energy consumed, which offers a prompt return on your investment.

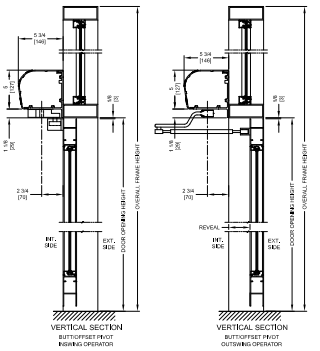
- Passed the one-million-cycle endurance test
- Separate components allow for lower repair costs



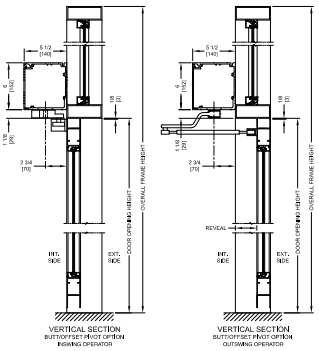
PRODUCT INFORMATION

Header dimensions	Side load - 5" H X 5 3/4" D (GT710) curved header Side load - 6" H X 5 1/2" D (GT8710)
Standard finish	Clear and dark bronze anodized
Optional finishes	Painted, clad, special anodized
Mounting	Surface applied or overhead concealed
Installation types	Push or pull
Operating voltage	120 VAC @ <5 amps
Auxiliary power output	12VDC 750mA
Operator drive	Electro-hydraulic
Motor voltage	Pulse width modulated
Motor type	1/8th HP @ peak
Control type	Microprocessor
Door panel weight	300 lbs.
Adjustable open	Force and speed
Adjustable close	Force and speed
Closing method	Spring/hydraulic (with selectable power assist)
Adjustable opening angle	Up to 145°
Power boost close	Selectable
Basic features	Low-energy operation Push and go Obstacle detection in opening and closing cycles Sequential or timer mode operation LCD display for programming and diagnostics Open- or closed-circuit safety inputs Momentary or maintained activation
Switch modes	On, off, hold-open
Opening and closing speed	Adjustable
Hold-open time	Adjustable (0-30 seconds)
Code compliances	ANSI A156.19/ANSI A117.1
Approvals	UL, ULC

GT710 Operator



GT8710 Operator



CONFIGURATIONS:
The GT710/8710 is available for multiple configurations, such as single doors, simultaneous pairs, and dual-egress, as well as the Opman configuration, which is a single continuous header for a pair of doors containing a manual closer on one side and an automatic operator on the other.

NABCO Service and Specifications

Along with the NABCO factory branches, NABCO has the largest independently owned network of automatic door distributors in North America. Their friendly, qualified installers and technicians always strive to exceed your expectations from install to after-sales service. NABCO's factory branches and independent distributors provide AAADM-certified technicians to ensure your doors meet all ANSI A156.10/A156.19 standards.

Complete three-part specifications and CAD drawings are available on the NABCO website.

NABCO

Member of the Nabtesco Group

Member AAADM

NABCO ENTRANCES INC.
S82 W18717 Gemini Drive | Muskego, WI 53150 | 877-622-2694 | Fax 888-679-3319
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Part 1 General

1.1 RELATED SECTIONS

.1 Section 01 33 00 - Submittal Procedures.

.2 Section 01 74 11 – Final Cleaning.

.3 Section 01 78 00 - Closeout Submittals

.4 Section 08 11 14 – Metal Doors and Frames.

.5 Section 08 50 50 – Aluminum Windows.

.6 Section 07 92 10 - Joint Sealing: caulking of joints between frames and other building components.

.7 Section 10 28 10 – Toilet, Bath and Laundry Accessories.

1.2 REFERENCES

.1 American National Standards Institute (ANSI).

.1 ANSI/ASTM E330-[02], Test Method for Structural Performance of Exterior Windows, Doors, Skylights and Curtain Walls by Uniform Static Air Pressure Difference.

.2 American Society for Testing and Materials International, (ASTM).

.1 ASTM C542-[94(1999)], Specification for Lock-Strip Gaskets.

.2 ASTM D790-[02], Test Methods for Flexural Properties of Unreinforced and Reinforced Plastics and Electrical Insulating Materials.

.3 ASTM D1003-[00], Test Method for Haze and Luminous Transmittance of Plastics.

.4 ASTM D1929-[96(R2001)e1], Test Method for Determining Ignition Temperature of Plastics.

.5 ASTM D2240-[02b], Test Method for Rubber Property - Durometer Hardness.

.6 ASTM E84-[01], Test Method for Surface Burning Characteristics of Building Materials.

.7 ASTM F1233-[98], Test Method for Security Glazing Materials and Systems.

.3 Canadian General Standards Board (CGSB).

.1 CAN/CGSB-12.1-[M90], Tempered or Laminated Safety Glass.

.2 CAN/CGSB-12.2-[M91], Flat, Clear Sheet Glass.

.3 CAN/CGSB-12.3-[M91], Flat, Clear Float Glass.

.4 CAN/CGSB-12.4-[M91], Heat Absorbing Glass.

.5 CAN/CGSB-12.5-[M86], Mirrors, Silvered.

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.6 CAN/CGSB-12.6-[M91], Transparent (One-Way) Mirrors.

.7 CAN/CGSB-12.8-[97], Insulating Glass Units.

.8 CAN/CGSB-12.9-[M91], Spandrel Glass.

.9 CAN/CGSB-12.10-[M76], Glass, Light and Heat Reflecting.

.10 CAN/CGSB-12.11-[M90], Wired Safety Glass.

.11 CAN/CGSB-12.12-[M90], Plastic Safety Glazing.

.12 CAN/CGSB-12.13-[M91], Patterned Glass.

.13 CAN/CGSB-12.1-M90 Tempered or Laminated Safety Glass

.14 CAN/CGSB-12.3-M76 Glass, Polished Plate or Float, Flat, Clear

.4 Canadian Standards Association (CSA International).

.1 CSA A440.2-[98], Energy Performance Evaluation of Windows and Sliding Glass Doors.

.2 CSA Certification Program for Windows and Doors [2000].

.5 Environmental Choice Program (ECP).

.1 CCD-045-[95], Sealants and Caulking.

.6 Flat Glass Manufacturers Association (FGMA).

.1 FGMA Glazing Manual - [1997].

.7 Laminators Safety Glass Association (LSGA).

.1 LSGA Laminated Glass Design Guide [2000].

1.3 SAMPLES

.1 Submit a 300 x 300 sample of all glass products in accordance with Section 01 33 00 - Submittal Procedures.

1.4 SHOP DRAWINGS

.1 Submit shop drawings in accordance with Section 013300 – Submittal Procedures. Co-ordinate location with Consultant.

1.5 WARRANTY

.1 Contractor hereby warrants glass against defects and failure, including leakage, under normal conditions of use, in accordance with the Contract, but for ten (10) years total, as follows:

.2 Supplier shall submit a written warranty from the insulated glass manufacturer to replace or repair any defects in materials or sealed units for a period of ten (10) years from the date of Substantial Completion.

.3 Mirrors:

.1 Submit a warranty for mirrors, covering the repair or replacement of defective work in accordance with the Contract, but for five (5) years total.

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.2 Warranty shall apply against defects in workmanship and materials and, against silver deterioration and loosening of fastenings.

1.6 WASTE MANAGEMENT AND DISPOSAL

.1 Remove from site and dispose of packaging materials at appropriate recycling facilities.

.2 Collect and separate for disposal [paper] [plastic] [polystyrene] [corrugated cardboard] packaging material [in appropriate on-site] for recycling.

.3 Unused or damaged glazing materials are not recyclable and must not be diverted to municipal recycling programs.

.4 Divert unused or damaged wood materials from landfill to [recycling] [reuse] [composting] facility approved by Consultant.

.5 Divert unused metal materials from landfill to metal recycling facility approved by Consultant.

.6 Divert unused caulking material from landfill to official hazardous material collections site approved by Consultant.

.7 Plastic caulking tubes are not recyclable and must not be diverted for recycling with other plastic materials.

Part 2 Products

2.1 MATERIALS

.1 Acceptable Manufacturers:

.1 AFG Glass Inc
.2 Libby-Owens Ford
.3 PPG Industries

.2 Exterior Tempered Safety Glass: All exterior Vision Glass to exterior windows, curtain wall to be sealed insulated units conforming to CAN/CGSB-12.8. Exterior lite 6mm tempered clear glass, Solarban 70 Low Emissivity Coating on 2nd surface, 13mm Argon filled air space, inner lite 6 mm clear tempered glass.".

.1 All tempered glass to conform to CAN2-12.1 M-90 Type 2 tempered glass, Class B Double glazed units to have an integral non-metallic space creating a 13 mm hermetically sealed Argon filled air space. Spacers shall be continuous with butt joints (if any) at corners only. Pieces are not permitted. Butyl based spacers are not permitted.

.3 Interior Tempered Safety Glass: CAN/CGSB-12.1-M, Type 2, Class B, Category II, clear.

.1 All interior vision glass to non-fire rated interior doors and screens to be minimum tempered 6 mm tempered clear float glass complete with etched tempered glass designation visible.

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.2 All interior vision glass within aluminum curtainwall assemblies to be minimum tempered 8 mm tempered clear float glass complete with etched tempered glass designation visible.

.4 Spandrel Glass (SP): CAN/CGSB-12.9-M, 6 mm thick unless otherwise indicated, with water-based silicone emulsion coating applied to backside, 'Opaci-Coat 300' by ICD High Performance Coatings or approved alternative. Colour: To be selected by the Consultant.

.5 Fire Rated Glazing ('FR' 'FRG' or 'GW'): Fire rated glazing to be impact safety rated, intumescent or ceramic laminated glazing to meet required fire resistance rating. Coordinate glazing thickness with screen frame manufacturer. Location: Windows within fire separations, other than glazing areas to be sprinklered:

.1 Fireswiss
.2 Pyrostop
.3 Pyrobel
.4 ContraFlam
.5 Firelite NT
.6 Pyran Platinum F

.6 Georgian Wired ('GW') rated glazing: not to be used on this project.

.7 Mirrors: Refer to Section 10 28 10 Washroom Accessories.

.8 Setting blocks: neoprene, 80 durometer hardness, 102 mm x 6 mm width to suit glass to extend from the fixed stop to the opposite face of the glazing unit.

.9 Spacer Blocks: neoprene, thickness to provide a minimum glass to face clearance of 3mm.

.10 Glazing tape**:** preformed polyisobutylene-butyl glazing tape with integral shim strip, 10-15 durometer, hardness, paper release, black color. Acceptable materials**:** Tremco Polyshim II by Tremco Ltd. or approved alternate.

.11 Gasket: black neoprene "U" cavity type with lock strip.

.12 Sealant: one component silicone, Spectrem 2 by Tremco Ltd. Refer to Section 07900.

.13 Display cases: shelves to be 13mm tempered glass with polished rounded edges. Doors to be tempered 8mm tempered glass. Coordinate sizes and provide to Section 06 40 00 for installation.

2.2 FABRICATION

.1 Fabricate in accordance with CSA-A440/A440.1 supplemented as follows:

.2 Make field measurements before cutting and assembling materials.

.3 Maintain minimum bite or lap of glass as recommended by the glazing unit manufacturer.

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.4 Each glass lite shall be labeled with the name of the product, weight and quality and year manufactured.

.5 If requested, provide owner or consultant access to the plant or shop to review fabrication. Consultant or owner to provide 24 hour advance notice of visit.

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:

.1 Inspect all glazing channels prior to application. All openings in joints and channels to be sealed shall be clean, dry and free of dust, oil, grease, loose mortar or any foreign material.

.2 All surfaces to receive glazing tape shall be wiped dry with a clean rag dampened in Xylol, followed by a dry wipe.

.3 Examine all sashes prior to glazing to determine if the openings are square and plumb. Any butt and miter joints which are open shall be sealed prior to glazing. Adjust all operating sashes and glaze in the closed position.

.4 Compression Glazing:

.1 When butt joint is in a vertical direction, the glazier shall first run the tape on the head and sill members while going over the joint. If joints at the sash run horizontally, the tape must be applied first to the jambs so that it crosses over the joint.

.2 When an offset condition exists at each corner where a horizontal member passes behind vertical mullions, two different sized tapes shall be used to equalize the pressure seal. The thinner tape is to applied first on the glazing leg closest to the

interior. The thicker tape shall be cut to the length between the two tapes and applied.

.3 Each section of tape shall butt the adjoining tape and be united with a tool to eliminate any openings. Lapping of the adjoining tapes at the corners is not permitted.

.4 Remove paper backing just prior to setting glass and apply a toe bead of sealant 150 mm long in each of the corners.

.5 Position one setting block at the quarter point of each corner on the sill members or as recommended by IGMA guidelines.

.6 Set the glass on the setting blocks and press firmly in place. Snap in the interior glazing stops.

.7 Set the spacer blocks to prevent any “walking” of the lite.

.5 Mirrors:

.1 Install mirrors by means of concealed vandalproof clips If clips are used, install cushioning tape completing around perimeter of mirror back, set in concealed location within 25 mm of edge. Install fixed mirrors in washrooms at two different heights as indicated on drawings.

.2 Follow manufacturer’s installation recommendations.

.6 Install any wired glass with the wire parallel to the opening.

.7 Replace any loose glazing stops and tighten all screws.

.8 Contractor shall include for needle point (cap beads) at all lower horizontal rail joints of all sash/glazing units at the discretion of and as may be requested by the Consultant or owner.

3.5 CLEANING

.1 Perform cleaning after installation to remove construction and accumulated environmental dirt.

.2 Remove traces of primer, caulking.

.3 Remove glazing materials from finish surfaces.

.4 Remove labels after work is complete.

.5 Immediately upon job completion and when sealants have cured, remove any temporary protection and clean all exposed interior and exterior surfaces. Use proper cleaning materials only which will not harm the window components or any adjacent surfaces.

.6 Ensure all temporary labels have been removed and fully cleaned.

.7 Mirrors:

.1 Clean mirrors using non-abrasive soap or detergent and rinse with clean water. Leave in clean, polished condition for Owner occupancy.

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3.6 INSPECTION

.1 Where inspection is called for elsewhere in the specification, perform Window air and water leakage test to ensure installation meets performance requirements stated herein. Should test fail, take remedial measures and re-test a different location at not additional cost to the owner until the test passes.

END OF SECTION

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Part 1 General

1.1 RELATED SECTIONS

.1 Section 01 33 00 Submittal Procedures.

.2 Section 01 78 00 Closeout Submittals.

.3 Section 07 92 10 Joint Sealants.

1.2 REFERENCES

.1 American Architectural Manufacturers Association (AAMA) Aluminum Association Designation System for Aluminum Finishes.

.2 American Society for Testing and Materials (ASTM International)
- .1 ASTM B209M-07, Specification for Aluminum and Aluminum-Alloy Sheet and Plate.
- .2 ASTM B211M-03, Specification for Aluminum and Aluminum-Alloy Bar, Rod and Wire.
- .3 ASTM C920-10, Specification for Elastomeric Joint Sealants.

.3 Canadian General Standards Board (CGSB):
- .1 CAN/CGSB-1.108-M89, Bituminous Solvent Type Paint.

1.3 DESIGN REQUIREMENTS

.1 Design louvre Work in accordance with OBC and to withstand live, dead, lateral. wind, seismic, handling, transportation and erection loads.

.2 Design louvers to accommodate expansion and contraction of components due to temperature changes.

1.4 SUBMITTALS

.1 Shop drawings: Submit shop drawings in accordance with Section 01 33 00 indicating fabrication and erection details, including anchorage, accessories, thicknesses, profiles, finishes, pressure drop, face area, and free area.

.2 Samples: Submit duplicate 600 x 600 mm samples of louvres in accordance with Section 01 33 00 indicating frame and reinforcing, finished in selected colours.

.3 Certification: Submit certified data from independent laboratory substantiating aerodynamic performance.

.4 Close-out submittals: Submit operation and maintenance data for incorporation into Operations and Maintenance Manual in accordance with Section 01 78 00.

Part 2 Products

2.1 MANUFACTURED UNITS

.1 Mechanical Penthouse Louvre:
- .1 Conforming to ASTM B209M and ASTM B211M;
- .2 100 mm (4") weather resistant louvre, 'Model SP-645' as manufactured by McGill Louvers, (Pickering ON 905-420-0485).
- .3 Acceptable Alternate: Product meeting the same profile and specifications as above by Cometal Inc. (Quebec, Ph: 418-839-8831) and TenPlus Architectural.
- .4 Colour: Custom colour to be later selected by the Consultant.
- .5 Provide concealed mullions. Refer to Exterior Elevations & sections.
- .6 Locations:
  - .1 Second floor Mechanical Room.

.2 Isolation coating: CAN/CGSB-1.108-M; Bituminous solvent type paint.

.3 Anchors and fasteners: AISI Type 304 stainless steel.

.4 Sealant: ASTM C920, Type M, Grade NS, Class 25; Two-part, Polyurethane non-sag type. Dymeric by Tremco Ltd., Sikaflex 2C-NS by Sika Inc., colour as selected by Consultant. Primer and joint backing as recommended by sealant manufacturer.

Part 3 Execution

3.1 INSTALLATION

.1 Coordinate framing and anchorage for louvres with other parts of the Work.

.2 Install louvres in accordance with manufacturer's instructions and accepted shop drawings. Securely anchor into opening.

.3 Apply isolation coating to separate dissimilar metals, and metals and masonry or concrete unless neoprene washers are shown.

.4 Seal louvre perimeter perimeter with sealant and joint backing for weather tight seal in accordance with requirements of Section 07 92 10.

END OF SECTION

Part 1 General

1.1 RELATED SECTIONS

.1 Section 01 33 00 - Submittal Procedures.

.2 Section 04 21 13 – Masonry

.3 Section 09 22 16 – Non-structural Metal Framing.

.4 Supply of access doors for mechanical and electrical devices in mechanical and electrical sections.

1.2 REFERENCES

.1 Aluminum Association

.1 Designation for Aluminum Finishes-[1997].

.2 American Society for Testing and Materials International, (ASTM)

.1 ASTM C36/C36M-[01], Specification for Gypsum Wallboard.

.2 ASTM C79/C79M-[01], Standard Specification for Treated Core and Non-treated Core Gypsum Sheathing Board.

.3 ASTM C442/C442M-[01], Specification for Gypsum Backing Board, Gypsum Coreboard, and Gypsum Shaftliner Board.

.4 ASTM C475-[01], Specification for Joint Compound and Joint Tape for Finishing Gypsum Board.

.5 ASTM C514-[01], Specification for Nails for the Application of Gypsum Board.

.6 ASTM C557-[99], Specification for Adhesives for Fastening Gypsum Wallboard to Wood Framing.

.7 ASTM C630/C630M-[01], Specification for Water-Resistant Gypsum Backing Board.

.8 ASTM C840-[01], Specification for Application and Finishing of Gypsum Board.

.9 ASTM C931/C931M-[01], Specification for Exterior Gypsum Soffit Board.

.10 ASTM C954-[00], 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.

.11 ASTM C960/C960M-[01], Specification for Pre-decorated Gypsum Board.

.12 ASTM C1002-[01], Specification for Steel Self-Piercing Tapping Screws for the Application of Gypsum Panel Products or Metal Plaster Bases to Wood Studs or Steel Studs.

.13 ASTM C1047-[99], Specification for Accessories for Gypsum Wallboard and Gypsum Veneer Base.

.14 ASTM C1280-[99], Specification for Application of Gypsum Sheathing Board.

.15 ASTM C1177-[01], Specification for Glass Mat Gypsum Substrate for Use as Sheathing.

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.16 ASTM C1178/C1178M-[01], Specification for Glass Mat Water-Resistant Gypsum Backing Board.

.3 Association of the Wall and Ceilings Industries International (AWEI)

.4 Canadian General Standards Board (CGSB)

.1 CAN/CGSB-51.34-[M86(R1988)], Vapour Barrier, Polyethylene Sheet for Use in Building Construction.

.2 CAN/CGSB-71.25-[M88], Adhesive, for Bonding Drywall to Wood Framing and Metal Studs.

.5 Underwriters' Laboratories of Canada (ULC)

.1 CAN/ULC-S102-[1988(R2000)], Surface Burning Characteristics of Building Materials and Assemblies.

1.3 DELIVERY, STORAGE AND HANDLING

.1 Deliver materials in original packages, containers or bundles bearing manufacturers brand name and identification.

.2 Store materials inside, level, under cover. Keep dry. Protect from weather, other elements and damage from construction operations and other causes.

.3 Handle gypsum boards to prevent damage to edges, ends or surfaces. Protect metal accessories and trim from being bent or damaged.

1.4 SITE ENVIRONMENTAL REQUIREMENTS

.1 Maintain temperature minimum 10 degrees C, maximum 21 degrees 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.

1.5 WASTE MANAGEMENT AND DISPOSAL

.1 Remove from site and dispose of packaging materials at appropriate recycling facilities.

.2 Collect and separate for disposal [paper] [plastic] [polystyrene] [corrugated cardboard] packaging material [in appropriate on-site] for recycling.

.3 Divert unused gypsum from landfill to gypsum recycling facility for disposal approved by Consultant.

.4 Divert unused metal materials from landfill to metal recycling facility approved by Consultant.

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.5 Divert unused wood materials from landfill to [recycling] [composting] facility approved by Consultant.

.6 Divert unused paint and caulking material from landfill to official hazardous material collections site approved by Consultant.

.7 Do not dispose of unused paint and caulking materials into sewer systems, into lakes, streams, onto ground or in other locations where it will pose health or environmental hazard.

Part 2 Products

2.1 MATERIALS

.1 Standard board: to ASTM C36/C36M, 13mm, 16 mm or 19 mm thick or as indicated, tapered edges.

.2 Standard board: to ASTM C36/C36M, X Rated, 16 mm or 19 mm thick or as indicated, tapered edges.

.3 Water-resistant board: to ASTM C630/C630M, 13 mm water resistant, tapered edges (WRGB in Finish Schedule).

.4 Abuse resistant/Fire rated: to CSA A82.27-M1977 Fire-Rated Type X, 5/8" thick, "Abuse Resistant Fire Code" gypsum board panels, tapered edges, by CGC, Fibrerock interior AquaTuff panel. All gypsum board to have anti-microbial and anti-mould properties.

.5 All gypsum board to have Anti-Microbial and Anti Mold properties. Acceptable Manufacturers; CGC inc., Certain Teed, or others meeting these specifications at time of tender.

.6 Nails: to ASTM C514.

.7 Steel drill screws: to ASTM C1002.

.8 Stud adhesive: to CAN/CGSB-71.25.

.9 Laminating compound: as recommended by manufacturer, asbestos-free.

.10 Concrete Anchors: Phillips Red Head TW-614 or equivalent. Do not use powder activated fasteners for ceiling support.

.11 Tie Wire: #16 ga. galvanized soft annealed steel wire.

.12 Caulking: Acoustical sealant.

.13 38 mm thick mineral wool batts ULC labeled, if indicated on drawings.

.14 Casing beads, corner beads, control joints and edge trim: to ASTM C1047, 0.5 mm base thickness commercial sheet steel with G90 zinc finish, perforated flanges, and one piece length per location.

.15 Sealants: in accordance with Section 07 92 10 - Joint Sealing.

.16 Insulating strip: rubberized, moisture resistant, [3] mm thick [cork] [closed cell neoprene] strip, [12] mm wide, with self sticking permanent adhesive on one face, lengths as required.

.17 Joint compound: to ASTM C475, asbestos-free.

2.2 ACOUSTIC WALL ASSEMBLY AND NOISE BARRIER CEILING MATERIALS

.1 **Location: Music Practice Rooms**:

.2 Acoustic insulation inside partitions: AFB Acoustic Fire Bat by Rockwool or equivalent product by Fibrex, or Quietzone by Owens Corning.

.3 Steel deck closures: Emseal 25V Expanding Foam Sealant sized and shaped to fit flutes.

.4 Acoustic Insulation: mineral fibre acoustical batt insulation, as specified under Section 07210. Thickness of 90% of wall assembly cavity depth; Acceptable products:

.1 Fibrex ‘Sound Attenuation Fire Batt (SAFB)’
.2 Johns Manville ‘Sound-SHIELD’.
.3 Rockwool ‘AFB’.
.4 Owens-Corning ‘QuietZone’.
.5 Certain Teed ‘Noise Reducer’.

.5 Acoustical sealant: CAN/CGSB-19.21-M87; non-skinning acoustic sealant, non-hardening type.

.6 Acoustical compound: pre-mixed perlite plaster.

.7 Fasteners: use mechanical fasteners to secure batts into position as recommended by manufacturer.

Part 3 Execution

3.1 ERECTION

.1 Do application and finishing of gypsum board in accordance with ASTM C840 except where specified otherwise.

.2 Erect hangers and runner channels for suspended gypsum board ceilings in accordance with ASTM C840 except where specified otherwise.

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.3 Support light fixtures by providing additional ceiling suspension hangers within 150 mm of each corner and at maximum 600 mm around perimeter of fixture.

.4 Install work level to tolerance of [1:1200].

3.2 APPLICATION

.1 Do not apply gypsum board until bucks, anchors, blocking, sound attenuation, electrical and mechanical works are approved.

.2 Apply single layer gypsum board to metal furring or framing using screw fasteners and laminating adhesive. Maximum spacing of screws 300 mm on centre.

.1 Single-Layer Application:

.1 Apply gypsum board on ceilings prior to application of walls in accordance with ASTM C840.

.2 Apply gypsum board vertically or horizontally, providing sheet lengths that will minimize end joints.

.2 Double-Layer Application:

.1 Install gypsum board for base layer and exposed gypsum board for face layer.

.2 Apply base layer to ceilings prior to base layer application on walls; apply face layers in same sequence. Offset joints between layers at least 250 mm.

.3 Apply base layers at right angles to supports unless otherwise indicated.

.4 Apply base layer on walls and face layers vertically with joints of base layer over supports and face layer joints offset at least 250 mm with base layer joints.

.3 Apply water-resistant gypsum board [where [wall tiles] [coating] to be applied] [and] [adjacent to [slop sinks] [janitors closets] [___]]. Apply water-resistant sealant to edges, ends, cut-outs which expose gypsum core and to fastener heads. [Do not apply joint treatment on areas to receive tile finish.]

.4 Apply gypsum board to concrete block surfaces, where indicated, using laminating adhesive.

.5 Apply type X gypsum board where indicated, in accordance with U.L.C. requirements and with supplement to the National Building Code of Canada to obtain the required fire protection, fire rating and fire separation.

.6 Install ceiling boards in direction that will minimize number of end-butt joints. Stagger end joints at least 250 mm.

.7 Where indicated on drawings, staple blanket to wallboard in accordance with ULC design requirements. Blanket shall be continuous and tightly fitted between studs and at perimeter.

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.8 Install gypsum board on walls vertically to avoid end-butt joints. At stairwells and similar high walls, install boards horizontally with end joints staggered over studs, except where local codes or fire-rated assemblies require vertical application.

.9 Install gypsum board with face side out.

.10 Do not install damaged or damp boards.

.11 Locate edge or end joints over supports. Stagger vertical joints over different studs on opposite sides of wall.

.12 Where a floor or roof structural member interferes with an interior partition wall at which a smoke or fire separation is required, a gypsum board enclosure with a fire rating not less than required for the wall must be provided to continue the required, a gypsum board enclosure with a fire rating not less than required for the wall must be provided to continue the required separation to the floor or roof above (typical)

3.3 INSTALLATION

.1 Erect accessories straight, plumb or level, rigid and at proper plane. Use full length pieces where practical. Make joints tight, accurately aligned and rigidly secured. Mitre and fit corners accurately, free from rough edges. Secure [at [150] mm on centre] [using contact adhesive for full length].

.2 Install casing beads around perimeter of suspended ceilings.

.3 Install casing beads where gypsum board butts against surfaces having no trim concealing junction and where indicated. [Seal joints with sealant.]

.4 Construct control joints of [preformed units] [two back-to-back casing beads] set in gypsum board facing and supported independently on both sides of joint.

.5 Provide continuous polyethylene dust barrier behind and across control joints.

.6 Locate control joints [where indicated] [at changes in substrate construction] [at approximate [10] m spacing on long corridor runs] [at approximate [15] m spacing on ceilings].

.7 Install control joints straight and true.

.8 Construct expansion joints [as detailed], at building expansion and construction joints. Provide continuous dust barrier.

.9 Install expansion joint straight and true.

.10 Install cornice cap where gypsum board partitions do not extend to ceiling.

.11 Fit cornice cap over partition, secure to partition track with two rows of sheet metal screws staggered at [300] mm on centre.

.12 Splice corners and intersections together and secure to each member with 3 screws.

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.13 Seal with acoustical sealant at ceilings, floors, wall intersections and all penetrations such as electrical outlets.

.14 Install access doors to electrical and mechanical fixtures specified in respective sections.

.1 Rigidly secure frames to furring or framing systems.

.15 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.

.16 Gypsum Board Finish: finish gypsum board walls and ceilings to following levels in accordance with Association of the Wall and Ceiling Industries (AWCI) International Recommended Specification on Levels of Gypsum Board Finish:

.1 Levels of finish:

.1 Level 0: No tapping, finishing or accessories required.

.2 Level 1: Embed tape for joints and interior angles in joint compound. Surfaces to be free of excess joint compound; tool marks and ridges are acceptable.

.3 Level 2: Embed tape for joints and interior angles in joint compound and apply one separate coat of joint compound over joints, angles, fastener heads and accessories; surfaces free of excess joint compound; tool marks and ridges are acceptable.

.4 Level 3: Embed tape for joints and interior angles in joint compound and apply two separate coats of joint compound over joints, angles, fastener heads and accessories; surfaces smooth and free of tool marks and ridges.

.5 Level 4: Embed tape for joints and interior angles in joint compound and apply three separate coats of joint compound over joints, angles, fastener heads and accessories; surfaces smooth and free of tool marks and ridges.

.6 Level 5: Embed tape for joints and interior angles in joint compound and apply three separate coats of joint compound over joints, angles, fastener heads and accessories; apply a thin skim coat of joint compound to entire surface; surfaces smooth and free of tool marks and ridges.

.17 Finish corner beads, control joints and trim as required with two coats of joint compound and one coat of taping compound, feathered out onto panel faces.

.18 Fill screw head depressions with joint and taping compounds to bring flush with adjacent surface of gypsum board so as to be invisible after surface finish is completed.

.19 Sand lightly to remove burred edges and other imperfections. Avoid sanding adjacent surface of board.

.20 Completed installation to be smooth, level or plumb, free from waves and other defects and ready for surface finish.

.21 Apply one coat of white primer sealer over surface to be textured. When dry apply textured finish in accordance with manufacturer's instructions.

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.22 Mix joint compound slightly thinner than for joint taping.

.23 Apply thin coat to entire surface using trowel or drywall broadknife to fill surface texture differences, variations or tool marks.

.24 Allow skim coat to dry completely.

.25 Remove ridges by light sanding or wiping with damp cloth.

.26 Provide protection that ensures gypsum drywall work will remain without damage or deterioration at time of substantial completion.

END OF SECTION

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Part 1 General

1.1 RELATED SECTIONS

.1 Section 09 21 16 - Gypsum Board Assemblies.

1.2 REFERENCES

.1 American Society for Testing and Materials International, (ASTM).

.1 ASTM C645-[00], Specification for Nonstructural Steel Framing Members.

.2 ASTM C754-[00], Specification for Installation of Steel Framing Members to Receive Screw-Attached Gypsum Panel Products.

.2 Canadian General Standards Board (CGSB).

.1 CAN/CGSB-1.40-[97], Primer, Structural Steel, Oil Alkyd Type.

.3 Environmental Choice Program (ECP).

.1 CCD-047a -[98], Paints - Surface Coatings.

.2 CCD-048-[98], Surface Coatings - Recycled Water-borne.

1.3 WASTE MANAGEMENT AND DISPOSAL

.1 Remove from site and dispose of packaging materials at appropriate recycling facilities.

.2 Collect and separate for disposal [paper] [plastic] [polystyrene] [corrugated cardboard] packaging material in appropriate on-site bins for recycling.

.3 Divert unused metal materials from landfill to metal recycling facility approved by Consultant.

.4 Divert unused gypsum materials from landfill to recycling facility approved by Consultant.

Part 2 Products

2.1 MATERIALS

.1 Non-load bearing channel stud framing: to ASTM C645, roll formed from 0.59mm thickness hot dipped galvanized steel sheet, for screw attachment of gypsum lath and metal lath. Knock-out service holes at 150 mm centres.

.2 Floor and ceiling tracks: to ASTM C645, in widths to suit stud sizes, 30 mm legs for floor track, 50 mm for ceiling track.

.3 Metal channel stiffener: 38 mm size, 2 mm thick cold rolled galvanized steel.

.4 Metal Accessories: CSA A82.30-1965 (R-1971).

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.5 "Unistrut" support channel framing, by Tyco Electrical and Metal Products.

Part 3 Execution

3.1 ERECTION

.1 Align partition tracks at floor and ceiling and secure at 600 mm on centre maximum.

.2 Place studs vertically at 400 mm on centre 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.

.3 Erect metal studding to tolerance of 1:1000.

.4 Attach studs to bottom track using screws.

.5 Co-ordinate simultaneous erection of studs with installation of service lines. When erecting studs ensure web openings are aligned.

.6 Install steel frames and anchor frames securely to studs using minimum of three (3) anchors per jamb for jambs up to 2100 mm high and a minimum of four (4) anchors per jambs for jambs over 2100 mm high.

.7 Provide two (2) studs at each side of openings wider than stud centre specified.

.8 Install, cut to length, piece of runner horizontally over door frames and at top and bottom of rough opening in glazed partitions.

.9 Provide 38 mm x 89 mm vertical and horizontal wood studs secured between metal studs for attachments of bathroom fixtures, accessories, cabinet work, and other fixtures, including grab bars, towel rails, attached to steel stud partitions.

.10 Install steel stud or furring channel between studs for attaching electrical and other boxes.

.11 Extend all partitions to underside of deck above for sound and fire separation.

.12 Maintain clearance under beams and structural slabs to avoid transmission of structural loads to studs.

3.2 CEILING FURRING TO CANOPIES & CEILING PANELS

.1 Provide to all interior and exterior canopies where shown to receive wood slat or plywood finishes.

.2 Framing channel to be model P1000 (1-5/8") ; 12 ga.

.3 For exterior locations provide with 4 m dia. Holes at 500 o.c. for drainage and hot dip galvanize.

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.4 Provide shop drawings for layouts.

.5 Refer to drawings for locations.

3.3 CEILING FURRING

.1 Install runners level to tolerance of 3 mm over 3.5 m. Provide runners at interruptions of continuity and change in direction.

.2 Frame with furring channels, perimeter of openings to accommodate access panels, light fixtures, diffusers, grilles, etc.

.3 Furr for bulkheads within or at termination or ceilings.

.4 Install furring channels at 400 mm o.c. maximum.

3.4 WALL FURRING

.1 Install steel furring, as indicated.

.2 Frame opening and around built-in equipment on four (4) sides with channels.

.3 Box-in beads, columns, pipes, and around exposed services.

3.5 FIRE RATED ASSEMBLIES

.1 If required, install Metal Stud System and Furring in accordance with appropriate ULC Design and with supplement to the National Building Code of Canada 1985.

3.6 CLEANING

.1 Upon completion of installation, remove surplus materials, rubbish, tools and equipment barriers.

END OF SECTION

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Part 1 General

1.1 RELATED SECTIONS

.1 Section 01 33 00 - Submittal Procedures.

.2 Section 07 92 10 - Joint Sealing.

1.2 REFERENCES

.1 American National Standards Institute (ANSI)/Ceramic Tile Institute (CTI)

.1 ANSI A108.1-[99], Specification for the Installation of Ceramic Tile (Includes ANSI A108.1A-C, 108.4-.13, A118.1-.10, ANSI A136.1).

.2 CTI A118.3-[92], Specification for Chemical Resistant, Water Cleanable Tile Setting and Grouting Epoxy and Water Cleanable Tile Setting Epoxy Adhesive (included in ANSI A108.1).

.3 CTI A118.4-[92], Specification for Latex Portland Cement Mortar (included in ANSI A108.1).

.4 CTI A118.5-[92], Specification for Chemical Resistant Furan Resin Mortars and Grounts for Tile Installation (included in ANSI A108.1).

.5 CTI A118.6-[92], Specification for Ceramic Tile Grounts (included in ANSI A108.1).

.2 American Society for Testing and Materials (ASTM International) International

.1 ASTM C144-[99], Specification for Aggregate for Masonry Mortar.

.2 ASTM C 207-[91(1997)], Specification for Hydrated Lime for Masonry Purposes.

.3 ASTM C847-[95(2000)], Specification for Metal Lath.

.4 ASTM C979-[99], Specification for Pigments for Integrally Coloured Concrete.

.3 Canadian General Standards Board (CGSB)

.1 CAN/CGSB-51.34-[M86(R1988)], Vapour Barrier, Polyethylene Sheet for Use in Building Construction.

.2 CGSB 71-GP-22M-[78], Adhesive, Organic, for Installation of Ceramic Wall Tile.

.3 CAN/CGSB-75.1-[M88], Tile, Ceramic.

.4 CAN/CGSB-25.20-[95], Surface Sealer for Floors.

.4 Canadian Standards Association (CSA International)

.1 CAN/CSA-A3000-[98], Cementitious Materials Compendium (Consists of A5-98, A8-98, A23.5-98, A362-98, A363-98, A456.1-98, A456.2-98, A456.3-98).

.2 CSA A123.3-[98], Asphalt Saturated Organic Roofing Felt.

.5 Terrazzo Tile and Marble Association of Canada (TTMAC)

.1 Tile Specification Guide 09300 [2000], Tile Installation Manual.

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.2 Tile Maintenance Guide [2000].

1.3 PRODUCT DATA

.1 Submit product data in accordance with Section 01 33 00 - Submittal Procedures.

.2 Include manufacturer's information on:

.1 Ceramic tile, marked to show each type, size, and shape required.
.2 Chemical resistant mortar and grout (Epoxy and Furan).
.3 Cementitious backer unit.
.4 Dry-set Portland cement mortar and grout.
.5 Divider strip.
.6 Elastomeric membrane and bond coat.
.7 Reinforcing tape.
.8 Levelling compound.
.9 Latex-Portland cement mortar and grout.
.10 Commercial Portland cement grout.
.11 Organic adhesive.
.12 Slip resistant tile.
.13 Waterproofing isolation membrane.
.14 Fasteners.

1.4 SAMPLES

.1 Submit samples in accordance with Section 01 33 00 - Submittal Procedures.

.2 Base tile: submit 300 x 300 mm sample panels of each colour, texture, size, and pattern of tile.

.3 Floor tile: submit 300 x 300 mm sample panels of each colour, texture, size, and pattern of tile.

.4 Trim shapes, bullnose cap and cove including bullnose cap and base pieces at internal and external corners of vertical surfaces, each type, colour, and size.

.5 Stair Accessories: submit duplicate samples of each trim.

.6 Adhere tile samples to [11] mm thick plywood and grout joints to represent project installation.

.7 Prepare a 2 m x 3m mock-up sample on site to ensure demonstration of installation details and quality control. Include stair accessories in mock-up.

1.5 DELIVERY, STORAGE AND HANDLING

.1 Deliver materials in containers with labels legible and intact and grade-seals unbroken.

.2 Store material so as to prevent damage or contamination.

.3 Store materials in a dry area, protected from freezing, staining and damage.

.4 Store cementitious materials on a dry surface.

1.6 WASTE MANAGEMENT AND DISPOSAL

.1 Remove from site and dispose of all packaging materials at appropriate recycling facilities.

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.2 Collect and separate for disposal packaging material in appropriate on-site bins for recycling.

.3 Unused adhesive, sealant and coating materials must be disposed of at an official hazardous material collections site as approved by the Consultant.

.4 Unused adhesive, sealant and coating materials must not be disposed of into the sewer system, into streams, lakes, onto the ground or in other location where it will pose a health or environmental hazard.

.5 Broken ceramic materials must be diverted from landfill to a local facility as approved by Consultant.

1.7 ENVIRONMENTAL CONDITIONS

.1 Maintain air temperature and structural base temperature at ceramic tile installation area above 12 ^{o}C for 48 h before, during, and 48 h after, installation.

.2 Do not install tiles at temperatures less than 12 ^{o}C or above 38 ^{o}C.

.3 Do not apply epoxy mortar and grouts at temperatures below 15 ^{o}C or above 25 ^{o}C.

1.8 EXTRA MATERIAL

.1 Provide maintenance materials in accordance with Section 01 78 00 - Closeout Submittals.

.2 Provide minimum 5% of each type and colour of tile required for project for maintenance use. Store where directed.

.3 Maintenance material to be of same production run as installed material.

1.9 EXTENDED WARRANTY

.1 Submit a warranty for entire wall tile installation, covering materials and labour and the repair or replacement of defective work in accordance with the Contract, but for three (3) years total.

Part 2 Products

2.1 FLOOR TILE

.1 Porcelain floor tile (Designation: POR1 & POR2): to CAN/CGSB-75.1.

.1 Acceptable Materials: Size 300 mm x 600 mm; “Integra”, “Urbancrete” or “Adrock” by Centura, “Regal” by Olympia Tile, all in matte finish. Allow for one (1) field colour from manufacturer’s full line and two (2) accent floor tiles.

.2 Locations: First Floor corridors, vestibules, washrooms and stairs where indicated – refer to drawings. Refer to Room Finish Schedule for locations.

.3 Install in a one-third staggered pattern.

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.4 Provide prefabricated movement joints in conjunction with slab saw cuts approx. 3500-6000mm distance (refer to floor pattern drawing).

.2 Porcelain tile – 'wood look' (Designation: POR3): to CAN/CGSB-75.1, Type 5, Class MR 4, 'wood look' and slip resistant Porcelain Tile. 150mm or 200mm x 1220mm (6" or 8" x 48") Colour to be selected from full line. Thin-set application.

.1 Acceptable Materials: "OUDH", by Centura.

.3 Porcelain floor tile bull-nose base (Designation: POR): to CAN/CGSB-75.1.

.1 Acceptable Materials: Size 76mm or 100 mm x 300 mm 'sit-on' bull-nose base; "Integra", "Cement Block", "Vitra" or "Adrock" by Centura or "Omnia" by Olympia Tile, all in matte finish. Allow for two (2) colours from manufacturer's Category/Group 2.

.4 Porcelain Tactile Attention Indicator Tiles: to CAN/CGSB-75.1.

.1 Acceptable Materials: Size 300 mm x 300 mm GT Black STOP Matt, 11 ¾" x 11 ¾", as manufactured by Atlas Concorde and distributed by Centura Tile. Colour: contrasting to field tile.

.2 Conforming to OBC Article 3.8.3.18., required to be installed at the top of all stairs, starting one tread depth back from the edge of the top stair. The depth of the tactile attention indicator shall be not less than 300mm and not more than 610mm. Tactile attention indicator to be porcelain tile of contrasting colour from landing and stair treads with differing textured finish.

2.2 WALL TILE

.1 Ceramic tile (Designation: CWT): to CAN/CGSB-75.1, Type 5, Class MR 4

.1 Size: 4" x 16", matte surface.
.2 Four colours to be selected from full colour line. Thin-set application.
.3 Acceptable Materials: Urban Max, by Centura or similar by Olympia.

.2 Locations: Washrooms, Drinking Fountain Niches, Corridor locations, other locations noted on Interior Elevations

.3 Tile Edging: Purpose-made, anodized aluminum, polished chrome finish, metal edge strips as manufactured Schluter Systems at all exposed tile edging: Profile – JOLLY; thickness as required for tile and tile set.

2.3 TRIM SHAPES

.1 Conform to applicable requirements of adjoining floor and wall tile.

.2 Use slip resistant trim shapes for horizontal surfaces of showers, overflow ledges, recessed steps, shower curbs, drying area curbs, and stools.

.3 Use trim shapes sizes conforming to size of adjoining field wall tile, including existing spaces, unless specified otherwise.

.4 Internal and External Corners: Provide trim shapes as follows where indicated.

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.1 Bullnose shapes for external corners including edges.

.2 Coved shapes for internal corners.

.3 Special shapes for:

.1 Base to floor internal corners to provide integral coved vertical and horizontal joint.

.2 Base to floor external corners to provide bullnose vertical edge with integral coved horizontal joint. Use as stop at bottom of openings having bullnose return to wall.

.3 Wall top edge internal corners to provide integral coved vertical joint with bullnose top edge.

.4 Wall top edge external corners to provide bullnose vertical and horizontal joint edge.

.5 Provide cove and bullnose shapes for where indicated and required to complete tile work.

2.4 MORTAR AND ADHESIVE MATERIALS

.1 Manufacturer's of commercial mortar, grout and adhesive having Product considered acceptable for use:

.1 Mapei

.2 Laticrete

.3 Flextile

.2 Walls: Mortarcrete Latex Mortar conforming to ANS1A118.4-1973, manufactured by L & M Ceramo Inc.

.3 Floors:

.1 Cement Mortar: Mixture of 1 part Portland cement, 4 parts dry sand and 1/10 hydraulic lime. Materials shall conform to the following:

.2 Portland Cement: To CAN3-A, Type 10.

.3 Hydrated Lime: To ASTM C-206 or 207, Type 5.

.4 Sand: To CSA A82.56, passing 1.6 mm sieve.

.5 Water: Potable, containing no contaminants which cause efflorescence.

.6 Thin Set Mortar: field mixed, blended sand-Portland cement-latex mortar, "Kerabond/Keralastic by Mapei.

.1 Acceptable Alternates: "Laticrete 4237 distributed by Ceratec Inc., or Flextile 52 thin set.

.2 Latex Additive: "Cemtex" by Master Builders, Laticrete 2022" distributed by Ceratec Inc.,

2.5 GROUT

.1 Colouring Pigments:

.1 Pure mineral pigments, limeproof and nonfading, complying with ASTM C979.

.2 Colouring pigments to be added to grout by manufacturer.

□

.3 Job coloured grout are not acceptable.

.4 Use in Commercial Portland Cement Grout, Dry-Set Grout, and Latex-Portland Cement Grout.

.2 Chemical-Resistant Grout for Walls:

.1 Epoxy grout: to ANSI A108.1, having quality, colour and characteristics to match epoxy bond coat. Adhesive and grout by same manufacturer.

.2 Epoxy Grout: "Latapoxy SP-100" Stainless, chemical resistant epoxy grout by Laticrete International. Colour from manufacturer's full range. Alternate: Kerapoxy by Mapei.

.3 Floors:

.1 Polymer modified grout as manufactured by MAPEI.

2.6 ACCESSORIES

.1 Stairs Nosings and Edge Trims:

.1 Stair nosing to be Schluter, TREP-S, Aluminum support with thermoplastic rubber insert (26mm), installed in conjunction with porcelain tile as per manufacturer's recommendations. Thermoplastic rubber insert piece colour to be selected by consultant.

.2 SCHIENE edge protection by Schluter, anodized aluminum to installed at all exposed stair tile edges. Mitre joints to suite stair angle. Size as required for tile and mortar bed.

.2 Prefabricated Movement Joints: purpose made Schluter, Dilex-KSN aluminum, sized as required for tile and mortar bed. Colour to be selected by consultant. To be installed directly above slab saw-cuts. Refer to floor pattern drawing for locations.

.3 Reinforcing mesh: 50 x 50 x 1.6 x 1.6 mm galvanized steel wire mesh, welded fabric design, in flat sheets.

.4 Divider strips:

.1 Laminated strips, core 32 x 3 mm black neoprene, outsides (both sides) brass 32 x 1.29 mm complete with anchors, both sides spaced at 150 mm on centre.

.2 Brass complete with anchors, both sides spaced at 150 mm on centre.

.5 Cleavage plane: [polyethylene film to CGSB 51-34] [No. 15 asphalt saturated felt to CSA A123.3] .

.6 Metal lath: to ASTM C847 finish, 10 mm rib at 2.17 kg/m^2.

.7 Transition Strips: purpose made metal extrusion; stainless steel type.

.8 Reducer Strips: purpose made metal extrusion; stainless steel type; maximum slope of 1:2.

.9 Prefabricated Movement Joints: purpose made, having a Shore A Hardness not less than 60 and elasticity of plus or minus 40 percent when used in accordance to TTMAC Detail 301EJ.

□

.10 Sealant: in accordance with Section 07 92 10 - Joint Sealing.

.11 Floor sealer and protective coating: [to CAN/CGSB-25.20, Type [1] [2]] [to tile and grout manufacturers recommendations].

2.7 MIXES

.1 Portland Cement:

.1 Scratch coat: 1 part portland cement, 1/5 to 1/2 parts hydrated lime to suit job conditions, 4 parts sand, 1 part water, [and latex additive where required]. Adjust water volume depending on water content of sand.

.2 Slurry bond coat: portland cement and water mixed to creamy paste. Latex additive may be included.

.3 Mortar bed for floors: 1 part portland cement, 4 parts sand, 1 part water. Adjust water volume depending on water content of sand. [Latex additive may be included].

.4 Mortar bed for walls and ceilings: 1 part portland cement, 1/5 to 1/2 parts hydrated lime to suit job conditions, 4 parts sand and 1 part water. Adjust water volume depending on water content of sand. [Latex additive may be included].

.5 Levelling coat: 1 part portland cement, 4 parts sand, minimum 1/10 part latex additive, 1 part water including latex additive.

.6 Bond or setting coat: 1 part portland cement, 1/3 part hydrated lime, 1 part water.

.7 Measure mortar ingredients by volume.

.2 Dry set mortar: mix to manufacturer's instructions.

.3 Organic adhesive: pre-mixed.

.4 Mix bond and levelling coats, and grout to manufacturer's instructions.

.5 Adjust water volumes to suit water content of sand.

2.8 PATCHING AND LEVELING COMPOUND

.1 Portland cement base, acrylic polymer compound, manufactured specifically for resurfacing and levelling concrete floors. Products containing gypsum are not acceptable.

.2 Have 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.

.3 Capable of being applied in layers up to 50 mm thick, being brought to feather edge, and being trowelled to smooth finish.

.4 Ready for use in 48 hours after application.

□

2.9 CLEANING COMPOUNDS

.1 Specifically designed for cleaning masonry and concrete and which will not prevent bond of subsequent tile setting materials including patching and levelling compounds and elastomeric waterproofing membrane and coat.

.2 Materials containing acid or caustic material are not acceptable.

Part 3 Execution

3.1 WORKMANSHIP

.1 Do tile work in accordance with TTMAC Tile Installation Manual 2000, "Ceramic Tile", except where specified otherwise.

.2 Apply tile [or backing coats] to clean and sound surfaces.

.3 Fit tile around corners, fitments, fixtures, drains and other built-in objects. Maintain uniform joint appearance. Cut edges smooth and even. Do not split tiles.

.4 Maximum surface tolerance 1:800.

.5 Make joints between tile uniform and approximately [1.5 mm] wide, plumb, straight, true, even and flush with adjacent tile. Ensure sheet layout not visible after installation. Align patterns.

.6 Lay out tiles so perimeter tiles are minimum 1/2 size.

.7 Install floor tiles as per pattern. Layout and install flash cove tile first, before floor tile, ensuring a flush edge on the horizontal surface by feathering to masonry walls as required to produce a straight line on the floor. Install floor tiles to pattern supplied by Architect at a later date. Contact consultant to review when approximately no more than 10 sq. m has been installed.

.8 Sound tiles after setting and replace hollow-sounding units to obtain full bond.

.9 Make internal angles square, external angles rounded.

.10 Make internal angles square, external angles chamfered at 45° with narrow tile strip.

.11 Construct cove base, as described using all special pieces available for inside and outside corners.

.12 For Floors: Use bull nose edged tiles at termination of wall tiles, except where tiles abut projecting surface or differing plane.

.13 Seal grouted joints with sealer.

.14 Keep building expansion joints free of mortar or grout.

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.15 For Walls: Use round edged tiles at termination of wall tile panels, except where panel abuts projecting surface or differing plane.

.16 Install divider strips at junction of tile flooring and dissimilar materials.

.17 Allow minimum 24 h after installation of tiles, before grouting.

.18 Clean installed tile surfaces after installation and grouting cured.

3.2 FLOOR TILE

.1 Install in accordance with TTMAC to applicable thinset detail.

3.3 STAIR TILE ACCESSORIES

.1 Install all accessories specified per manufacturer’s instructions using whole lengths.

.2 Provide sample installation for architect for review.

3.4 FLOOR SEALER AND PROTECTIVE COATING

.1 Apply in accordance with manufacturer's instructions.

END OF SECTION

□

Part 1 General

1.1 RELATED SECTIONS

.1 Section 01 33 00 - Submittal Procedures.

.2 Section 01 78 00 - Closeout Submittals.

.3 Section 06 10 10/06101 - Rough Carpentry: Wood strapping.

.4 Fabrication: to ASTM 365-78 and CAN/GSB-92.1-M77.

.5 Installation: to ASTM C636-76, except where specified otherwise.

1.2 REFERENCES

.1 American Society for Testing and Materials (ASTM)

.1 ASTM E1264-[98], Classification for Acoustical Ceiling Products.

.2 Canadian General Standards Board (CGSB)

.1 CAN/CGSB-51.34-[M86], Vapour Barrier, Polyethylene Sheet, for Use in Building Construction.

.2 CAN/CGSB-92.1-[M89], Sound Absorptive Prefabricated Acoustical Units.

.3 Canadian Standards Association (CSA)

.1 CSA B111-[74(R1998)], Wire Nails, Spikes and Staples.

.4 Underwriters Laboratories of Canada (ULC)

.1 CAN/ULC-S102-[88(R2000)], Surface Burning Characteristics of Building Materials.

1.3 SAMPLES

.1 Submit samples in accordance with Section 01 33 00 - Submittal Procedures.

.2 Submit two each 300 x 300 mm samples of each individual tile and grid type in accordance with Section 01340.

1.4 REGULATORY REQUIREMENTS

.1 Fire-resistance rated floor/ceiling and roof/ceiling assembly: certified by a Canadian Certification Organization accredited by Standards Council of Canada.

1.5 DESIGN CRITERIA

.1 Maximum deflection 1/360 of span to ASTM 365-78 deflection test.

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1.6 WASTE MANAGEMENT AND DISPOSAL

.1 Collect and separate plastic, paper packaging and corrugated cardboard in accordance with Waste Management Plan

1.7 ENVIRONMENTAL REQUIREMENTS

.1 Permit wet work to dry before commencement of installation.

.2 Maintain uniform minimum temperature of 15^0C and humidity of 20 - 40% before and during installation.

.3 Store materials in work area 48 hours prior to installation.

1.8 EXTRA MATERIALS

.1 Provide extra materials of acoustic units in accordance with Section 01 78 00 - Closeout Submittals.

.2 Provide acoustical units amounting to 2 % of gross ceiling area for each pattern and type required for project.

.3 Extra materials to be from same production run as installed materials.

.4 Clearly identify each type of acoustic unit, including colour and texture.

.5 Store where directed by Consultant.

Part 2 Products

2.1 MATERIALS

.1 Acoustic units for suspended ceiling system: to CAN/CGSB-92.1.

.2 Acoustic Ceiling Panels, Designation LAP: Acoustic Ceiling Panels, wet formed mineral fibre panels, by Armstrong World Industries Canada Inc., Mississauga. Colour: White; Types as noted below:

.3 **Panel Types**:

.1 Type 1: LAP: 610 x 1220 mm x 15.9 mm thick; 'Fine Fissured' with medium texture, Square Lay-In, #1729; Location: For use at classroom areas, corridors and all other areas as indicated.

.2 Type 2: ACP: ACP: 1220 x 2440 mm thick, 'Optima PB CAPZ' Square Edge with acoustically transparent membrane #3933. For use in Forum 102, Art 239 and Music 242 with Capz accent hardware as indicated.

.4 Acceptable alternates for LAP: similar purpose-designed high humidity ceiling panels by CGC Interiors, BPB Canada Inc. and Certainteed.

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.5 Acceptable alternates for SAP 'Acoustical Clouds': similar purpose-designed acoustical panels such as 'Avanti' acoustical ceiling clouds by Sound Solutions and 'Nuvola' Acoustical Clouds by Decoustics or Sound Seal (dist. By Wallworks Acoustic Arch. Products 647 808-5450), Shapes by Sound Concepts or Conwed Skyway Cloud by Owens Corning.

.6 **Suspension System Type 1**: 23.8 mm (15/16") "Prelude XL" exposed tee bar grid, including wall moulding, by Armstrong. Colour: white. Acceptable alternate: similar suspension system by CGC Interiors, Oakville and Chicago Metallic Corp. Grid sizes to suit ceiling panel types as shown on drawings.

.7 **Accent Hardware:** 'Capz (ARCAPSL)' by Armstrong World Industries Canada Inc., or acceptable alternate in silver colour with smooth finish. For use with Type 2 acoustic tile.

.8 Suspension System for Radiant Panel Heaters: not applicable to this project.

.9 Hangers: 2.6 mm galvanized soft annealed steel wire.

.10 Accessories: splices, clips, retainers, etc., to complement suspension system components.

.11 Adhesive: low VOC type recommended by acoustic unit manufacturer.

.12 Staples, nails and screws: to CSA B111 non-corrosive finish as recommended by acoustic unit manufacturer.

.13 Hold down clips: purpose made clips to secure tile to suspension system, approved for use in fire-rated systems.

Part 3 Execution

3.1 EXAMINATION

.1 Do not install acoustical panels and tiles until work above ceiling has been inspected by Consultant.

3.2 INSTALLATION

.1 Install acoustical panels and tiles in ceiling suspension system.

.2 Install acoustic units parallel to building lines with edge unit not less than 50% of unit width.

.3 Scribe acoustic units to fit adjacent work. Butt joints tight, terminate edges with moulding.

.4 Support suspension system main runners at 1200 oc maximum with hangers from structure. Assembly shall support super-imposed loads. Maximum permissible deflection, 1/360 of span.

.5 Attach cross member to main runner to provide rigid assembly.

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.6 Install suspension assembly to manufacturer's written instructions.

.7 Install flush edge moulding at junction of acoustic unit ceiling and other materials around entire length of joint. Secure to construction. Butt joints neatly, square and true in alignment.

.8 Set acoustic units in place.

.9 Set all ceiling levels by the use of transit or laser level.

.10 Ensure all installations are clean upon owner acceptance. Be responsible for monitoring damage and soiling after installation and before owner occupancy. Prior to owner takeover, replace all tiles with damage, blemishes or soiling whether caused by subcontractor handling or post installation above-ceiling adjustments, balancing, cabling, etc.

.11 Provide for Owner twelve (12) complete, undamaged ceiling tiles of each type, sealed and boxed. Leave in location as directed by Architect.

3.3 INTERFACE WITH OTHER WORK

.1 Co-ordinate ceiling work to accommodate components of other sections, such as light fixtures, diffusers, speakers, sprinkler heads, to be built into acoustical ceiling components.

END OF SECTION

□

Part 1 General

1.1 RELATED SECTIONS

.1 Section 01 33 00 - Submittal Procedures

1.2 REFERENCES

.1 American Society for Testing and Materials (ASTM International)

.1 ASTM F1303-[99], Specification for Sheet Vinyl Floor Covering with Backing.

.2 Canadian Standards Association (CSA International)

.1 CAN/CSA-ISO 14040-[97], Environmental Management - Life Cycle Assessment - Principles and Framework (Adopted ISO 14040:1997, first edition).

1.3 SAMPLES

.1 Submit samples in accordance with Section 01 33 00 - Submittal Procedures.

.2 Submit duplicate 300 x 300 mm sample pieces of sheet material, 300 mm long base, nosing, feature strips, treads, edge strips.

1.4 CLOSEOUT SUBMITTALS

.1 Provide maintenance data for resilient flooring for incorporation into manual specified in Section 01 78 00 - Closeout Submittals.

1.5 ENVIRONMENTAL REQUIREMENTS

.1 Maintain air temperature and structural base temperature at flooring installation area above 20^{o} for 48 hours before, during and 48 hours after installation.

1.6 WASTE MANAGEMENT AND DISPOSAL

.1 Do not dispose of unused sealant and adhesive materials into landfill. Divert materials to municipal hazardous materials depot approved by Consultant.

.2 Divert unused metal and wiring materials from landfill to metal recycling facility approved by Consultant.

.3 Remove from site and dispose of packaging materials at appropriate recycling facilities.

1.7 QUALITY ASSURANCE

.1 Supplier shall be an established firm experienced in the field.

.2 Installer:

.1 Flooring contractor experienced in the field and approved by the manufacturer.

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.2 Flooring contractor shall have manual instructions and be trained by the manufacturer and distributor.

.3 Manufacturer's recommendations for the correct preparation, finishing and testing sub floor surface.

1.8 EXTENDED WARRANTY

.1 Submit a warranty for all the installation of all resilient sheet flooring, covering materials and labour and the repair or replacement of defective work in accordance with the General Conditions of the Contract, but for seven (7) years total.

Part 2 Products

2.1 MATERIALS

.1 Resilient Sheet Flooring **Type 1** (SF-SP): Acceptable materials:

.1 Acceptable Materials:
- .1 Gerflor, Recreation 60
- .2 Tarkett OmniSports MultiFlex
- .3 Polyflor Sport 67

.2 Locations: Gymnasium. Refer to Room Finish Schedule.

.3 Allow for two (2) colours for manufacturer's full range.

.2 Resilient Sheet Flooring **Type 2** (SF-A): Acceptable materials:

.1 Acceptable Materials:
- .1 Gerflor, Taralay Impression Comfort
- .2 Tarkett OmniSports 3.5 (3.5mm)
- .3 Polyflor Harmony fx U4 Acoustic (3.7 mm)

.2 Locations: Kindergarten classrooms and Childcare rooms; Refer to Room Finish Schedule.

.3 Allow for four (3) colours for manufacturer's full range.

.3 Resilient Sheet Flooring **Type 3** (SF-R): Acceptable materials:

.1 Acceptable Materials:
- .1 Gerflor, Mipolan Affinity
- .2 Tarkett Johnsonite IQ Granit/Micro Granit
- .3 Polyflor Classic Mystique PUR

.2 Locations: classrooms and other areas noted in Room Finish Schedule.

.3 Allow for four (3) colours for manufacturer's full range.

.4 Characteristics:

.1 Surface resistance: Unaffected by surface water and chemicals.

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.2 Slip resistance tested in accordance with ASTM D2047 Static coefficient of friction: Dry 0.95, Wet 0.93.

.3 Meets ULC 102.2 Flame spread 5, Smoke developed 295.

.4 Wear Resistance: ASTM C501 Wear index 436.

.5 Static Load Limit: 500 PSI.

.6 Hygiene: Bacteriostat retards the growth of bacteria.

.5 Self-Levelling Underlayment: **"**Ultraplan 1**"** by Mapei fast setting, polymer-modified; for over concrete, plywood, ceramic tile, old cutback adhesive, and old vinyl and vinyl composition flooring, feather edge to 1 1/2" (38 mm) for use to prepare floor at locations where existing flooring is not level. Flooring contractor is required to install self-levelling underlayment to their satisfaction to uphold required warranty.

.6 Filler and Cover Former:

.1 As recommended by manufacturer to suit subfloor on which its material is installed and to suit vertical wall/floor junctions.

.7 Primers and Adhesives: As recommended by manufacturer of material to suit subfloor condition.

.8 Cleaner: Neutral chemical compound that will not damage sheet or affect its colour.

.9 Welding Rod: PVC welding rod, colour to match resilient sheet flooring.

.10 Cap strip: sized to suit application, type recommended by flooring manufacturer, Altro Stainless Steel Cap, mechanically fastened to wall

Part 3 Execution

3.1 SITE VERIFICATION OF CONDITIONS

.1 Ensure concrete floors are clean and dry by using test methods recommended by flooring manufacturer.

3.2 PREPARATION

.1 Scope includes preparation of floor using self levelling coating and patching compound as required.

.2 Remove sub-floor ridges and bumps. Fill low spots, cracks, joints, holes and other defects with sub-floor filler.

.3 Clean floor and apply filler; trowel and float to leave smooth, flat hard surface. Prohibit traffic until filler cured and dry.

.4 Remove or treat old adhesives to prevent residual, old flooring adhesives from bleeding through to new flooring and/or interfering with the bonding of new adhesives.

.5 As required, seal concrete slab to resilient flooring manufacturer's printed instructions.

□

3.3 INSTALLATION

.1 Install on a smooth, flat concrete finish, which will be achieved manually or mechanically.

.2 Ensure concrete sub floor temperature to be maintained at a minimum of 70°F during installation and ensure the moisture content does not exceed 3 Lbs per 1000 Sq Ft per 24 hours or lower.

.3 Paint game lines using approved game line paint primer and game line paint in strict accordance with the game line paint manufacturer's instructions.

.4 Before proceeding with any work, inspect the sub floor surface and report, in writing, to the project manager and the General Contractor any visible defect on the surface, such as cracks, bumps, rough areas or variations in planarity.

.5 This installation is to proceed on an existing concrete slab in addition to new concrete work as required for mechanical services. Ensure slab is adequately cured and free of moisture or contaminants. If necessary, as part of the work of this section, scarify existing surfaces to prepare surface for adhesive, or to meet manufacturer's installation requirements. Fill joints, cracks, and holes in these surfaces and level surface irregularities with filler. Remove prime paint and wire brush steel base surfaces.

.6 Check for any grease, oil, paint, duct or any combination remaining on the concrete sub floor.

.7 Before proceeding with installation, clean concrete surface to remove any dirt or foreign materials, rinse thoroughly and allow eight (8) hours minimum to dry, if required, sanding is necessary in all installations.

.8 Fill any areas not meeting ±1/8" in 10' for level before installation. This will insure levelness and proper adhesion of material.

.9 Lay each material in accordance with manufacturer's specifications.

.10 Weld joints on flooring and internal and external angles of coves using welding rod in matching plain colours, and the standard hot-air-welding technique.

.11 Install standard rubber base at resilient sheet flooring locations.

.12 Flash into drain openings; do not cut on surface at edge of drain cover. Coordinate with Division 15 for installation with suitable drain type and cover. Bond flooring to drain flange under clamping ring using epoxy adhesive.

.13 Extend resilient sheet under all cabinet work and casework to the wall line.

3.4 CLEANING

.1 Remove excess adhesive from floor, base and wall surfaces without damage.

.2 Clean, seal and wax floor and base surface to flooring manufacturer's printed instructions.

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3.5 PROTECTION

.1 Protect new floors from time of final set of adhesive, with polyethylene or Kraft paper until final inspection.

.2 Prohibit traffic on floor for 48 hours after installation.

.3 Do not wax.

END OF SECTION

□

Part 1 General

1.1 RELATED SECTIONS

.1 Section 01 33 00 - Submittal Procedures.

.2 Section 03 30 00 – Cast-in-Place Concrete.

.3 Section 03 35 05 – Concrete Floor Hardeners.

1.2 REFERENCES

.1 American Society for Testing and Materials (ASTM International)

.1 ASTM F1066-[99], Specification for Vinyl Composition Floor Tile.

.2 ASTM F1344-[00], Specification for Rubber Tile.

.2 Canadian General Standards Board (CGSB)

.1 CAN/CGSB-25.20-[95], Surface Sealer for Floors.

.2 CAN/CGSB-25.21-[95], Detergent-Resistant Floor Polish.

1.3 SAMPLES

.1 Submit samples in accordance with Section 01 33 00 - Submittal Procedures.

.2 Submit duplicate tile in size specified, 300 mm long.

1.4 WASTE MANAGEMENT AND DISPOSAL

.1 Remove from site and dispose of packaging materials at appropriate recycling facilities.

.2 Collect and separate for disposal [paper] [plastic] [polystyrene] [corrugated cardboard] packaging material in appropriate on-site bins for recycling.

.3 Dispose of unused finish and adhesive materials at official hazardous material collections site approved by Consultant.

.4 Do not dispose of unused finish and adhesive materials into sewer system, into streams, lakes, onto ground or in other locations where it will pose health or environmental hazard.

1.5 ENVIRONMENTAL REQUIREMENTS

.1 Maintain air temperature and structural base temperature at flooring installation area above 20^{o}C for 48 hours before, during and for 7 days after installation.

1.6 EXTRA MATERIALS

.1 Provide 6 m^2 or 3% of each colour, pattern and type flooring material required for this project for maintenance use.

□

.2 Extra materials to be from same production run as installed materials.

.3 Clearly identify each container of floor tile and each container of adhesive.

.4 Store where directed by Consultant.

Part 2 Products

2.1 MATERIALS

.1 Luxury Vinyl Tile (LVT): 3mm tile thickness, 299mm x 1219mm (9" x 48") or 457 x 457mm (18" x 18") size square or plank sizing, with 20 year commercial warranty. Allow for total of three (3) colours from full line.

.1 Acceptable Manufacturers:

.1 Mirra, by Centura

.2 I.D. Latitude, by Tarkett

.3 Expona Commercial PUR, by Polyflor

.4 Natural Creations Arbor Art, by Armstrong

.5 Spacia First 20, by Mannington

.6 Lavencia, by Altro

.7 Creation 55 by Gerflor

.2 Resilient base (RR): rubber, top set coved, 3 mm thick, rubber, 100 mm high minimum 1200 mm long, including premoulded end stops and external corners. Acceptable materials: non-shrink Rubber Wall Base with toe as manufactured by Johnsonite. Colours: Six (6) from full Johnsonite "Coloright" colour line.

.3 Rubber Stair Tread/ Riser combination (RSTR): Minimum of 5 mm thick, visually impaired Round Raised Disk pattern, rubber one-piece tread/ riser combination with speckled pattern. Stair tread to be one piece, for full width of stair. Include contrast strip on stair nosing for visual impaired, including mid and upper landings. Acceptable materials: VIRTR-Rd, as manufactured by Johnsonite, ROPPE, Activa Rubber Flooring, Flexco or Nora Rubber Flooring. Stair tread with contrast edge strip and no upstand is to be inserted into floor tile at top stair at mid and top landings. Stair treads to be speckled using minimum three colours.

.4 Rubber Tile at Stair Mid and Upper Landings (RT): Minimum of 5 mm thick, hammered finish rubber tile, 600mm x 600mm square. Stair tread with contrast edge strip and no upstand is to be inserted into floor tile at top stair at mid and top landings. Acceptable materials: Johnsonite, ROPPE, Activa Rubber Flooring, Flexco, or Nora Rubber Flooring. Tile to be marbleized or speckled using three colours.

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.5 Tactile attention indicator: conforming to OBC Article 3.8.3.18. required to be installed at the top of all stairs, starting one tread depth back from the edge of the top stair. The depth of the tactile attention indicator shall be not less than 300mm and not more than 610mm. Tactile attention indicator to be rubber tile of contrasting colour from landing and stair treads with differing textured finish. Acceptable Products: 300mm x 600mm 'Safe Sense Warning Indicator' rubber tiles by Johnsonite, or approved alternates.

.6 Vinyl Cove Base adhesives: 'Johnsonite 990 Solvent Free Environmentally Safe White Acrylic Cove Base Adhesive'. Submit product data sheets.

.7 Primer: 'Flextile 43 Latex Additive' by Flextile. Submit product data sheets

.8 Sub-floor filler and leveller: 'Flextile Patch' by Flextile, or alternate as recommended by flooring manufacturer for use with their product.

.9 VCT Adhesive: Acceptable Materials: Armstrong S-515 Moisture Resistant, clear, waterproof adhesive. Submit product data sheets

.10 Metal edge strips: aluminum extruded, smooth, with lip to extend under floor finish, shoulder flush with top of adjacent floor finish.

.11 Polyethylene sheet: to CAN2 51.33-M77, Type 2, for protection.

.12 Nose filler: Epoxy caulking compound Johnsonite 930.

.13 Nose filler: Epoxy caulking compound Johnsonite 930.

.14 Transition strips; as required between adjacent flooring finishes: manufactured by Johnsonite or Mercer or Finercraft to suit conditions at the place of the work for smooth transition. Colour to later selection by Consultant from manufacturer's full range. Adhesive to be as recommended by manufacturer.

.15 Vinyl Reducing Strip: Johnsonite RRS-XX-C; to suit thickness of flooring; colours selected by Consultant.

.16 Vinyl Adaptor: Johnsonite CTA-XX-K; colours selected by Consultant.

Part 3 Execution

3.1 INSPECTION

.1 Ensure concrete floors are dry, by using test methods recommended by tile manufacturer. Inspect for negative alkalinity, carbonization or dusting.

.2 Commencement of work indicates acceptance of conditions by flooring installer.

3.2 SUB-FLOOR TREATMENT

.1 Confirm concrete floors where porcelain tile meets resilient has been depressed to allow for flush condition. Do NOT feather edges of resilient tile floors flush without prior review and approval of the Architect.

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.2 Remove sub-floor ridges and bumps. Fill low spots, cracks, joints, holes and other defects with sub-floor filler.

.3 Clean floor and apply filler; trowel and float to leave smooth, flat hard surface. Prohibit traffic until filler cured and dry.

3.3 TILE APPLICATION

.1 Apply adhesive uniformly using recommended trowel in accordance with flooring manufacturer's instructions. Do not spread more adhesive than can be covered by flooring before initial set takes place.

.2 Lay flooring with joints parallel to building lines to produce symmetrical tile pattern. Border tiles minimum half tile width.

.3 Install tiles in corridor as per pattern provided by Consultant. Pattern will be provided at a later date.

.4 Cut tile and fit neatly around fixed objects.

.5 Install flooring in pan type floor access covers. Maintain floor pattern.

.6 Terminate flooring at centerline of door in openings where adjacent floor finish or colour is dissimilar.

.7 Install metal edge strips at unprotected or exposed edges where flooring terminates.

.8 At doorways to incrapack units, extend tile and base fully into door opening to incrapak classroom.

.9 Install solid colour vinyl strip to form gymnasium game lines, as indicated on drawings. Cut field tiles tight and smooth contour against game lines. Strips to be minimum of 300 mm long on curves and of indicated width and colour.

3.4 BASE APPLICATION

.1 Lay out base to keep number of joints at minimum. Use lengths as long as practicable and not less than minimum 500 mm long.

.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 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 premoulded end pieces at flush door frames.

.7 Miter internal corners. Use premoulded corner pieces at all external corners and ensure full adhesion through to ends of corner pieces. See detail for termination at door frames.

□

.8 Install toeless type base before installation of carpet on floors.

.9 Leave in the building one (1) complete carton of each of two (2) colours of floor tile and twelve (12) tiles of each of the remaining colours. Colours of extra tile to be specified by Consultant.

3.5 INITIAL MAINTANANCE AFTER INSTALLATION

.1 Broom sweep or vacuum thoroughly.

.2 Do not wet mop, wash, scrub, or strip the floor. These procedures will be done by the Owner.

3.6 PROTECTION OF FINISHED WORK

.1 Following broom sweeping, protect new floors with 0.15 mm thick Polyethylene cover and lay planking in all necessary traffic areas to minimize damage by other trades. Maintain until just before final inspection.

.2 Prohibit traffic on floor for 48 hours after installation.

3.7 PREPARATION FOR INSPECTION

.1 Only if so notified by Architect, and in the presence of the Owner, scrub the floor using a neutral detergent and a floor machine of 170-250 rpm capability equipped with a scrub brush or a scrubbing pad (3M blue or equal).

.2 Lightly rinse and allow to dry. Note: Do not flood the floor with rinse water, scrubbing, or stripping solutions. Final re-washing, if required, and waxing will be done by owner.

END OF SECTION

□

Part 1 General

1.1 RELATED SECTIONS

.1 Section 01 33 00 - Submittal Procedures

.2 Section 01 51 00 - Temporary Utilities.

.3 Section 01 78 00 - Closeout Submittals.

1.2 REFERENCES

.1 American Association of Textile Chemists and Colorists (AATCC)

.1 AATCC 16-[1998], Color Fastness to Light.
.2 AATCC 23-[1999], Color Fastness to Burn Gas Fumes.
.3 AATCC 118-[1997], Oil Repellency: Hydrocarbon Resistance Test.
.4 AATCC 129-[2001], Colour Fastness to Ozone in the Atmosphere Under High Humidities.
.5 AATCC 134-[2001], Electrostatic Propensity of Carpet.
.6 AATCC 171-[2000], Carpets: Cleaning of; Hot Water Extraction Method.
.7 AATCC 174-[1998], Antimicrobial Activity Assessment of Carpets.
.8 AATCC 175-[1998], Stain Resistance: Pile Floor Coverings.
.9 AATCC 189-[2001], Fluorine Content of Carpet Fibers.

.2 American Society for Testing and Materials (ASTM International)

.1 ASTM D1055-[97], Specification for Flexible Cellular Materials - Latex Foam.
.2 ASTM D1335-[98], Tuft Bind of Pile Floor Coverings.
.3 ASTM D1667-[97], Standard Specification for Flexible Cellular Materials-Vinyl Chloride Polymers and Copolymers (Closed-Cell Foam).
.4 ASTM D3936-[00] Standard Test Method for Resistance to Delamination of the Secondary Backing of Pile Yarn Floor Covering.
.5 ASTM D5252-[98a], Standard Practice for the Operation of the Hexapod Drum Tester.
.6 ASTM D5417-[99], Standard Practice for Operation of the Vettermann Drum Tester.
.7 ASTM E84-[01], Test Method for Surface Burning Characteristics of Bulding Materials.
.8 ASTM E648-[00], Standard Test Method for Critical Radiant Flux of Floor-Covering Systems Using a Radiant Heat Energy Source.
.9 ASTM E662-[01], Standard Test Method for Specific Optical Density of Smoke Generated by Solid Materials.

.3 Canadian General Standards Board (CGSB)

.1 CAN/CGSB-4.2 No.27.6-[M91], Textile Test Methods - Flame Resistance - Methemine Tablet Test for Textile Floor Coverings.

□

.2 CAN/CGSB-4.2 No.77.1-[94]/ISO 4919:1978, Textile Test Methods - Carpets - Determination of Tuft Withdrawal Force.

.3 CGSB 4-GP-36M-[78], Carpet Underlay, Fiber Type.

.4 CAN/CGSB-4.129-[93(R1997)], Carpets for Commercial Use.

.5 CGSB 20-GP-23M-[78], Cushion, Carpet, Flexible Polymeric Material.

.6 CAN/CGSB-25.20-[95], Surface Sealer Floors.

.4 Carpet and Rug Institute (CRI)

.1 CRI-104-[96], Standard Installation of Commercial Carpet.

.2 IAQ Carpet Testing Program.

.5 National Floor Covering Association (NFCA)

.1 Floor Covering Specification Manual [1998].

.6 Underwriters' Laboratories of Canada (ULC)

.1 CAN/ULC-S102-[88(R2000)], Surface Burning Characteristics of Building Materials and Assemblies.

.2 CAN/ULC-S102.2-[88(R2000)], Surface Burning Characteristics of Flooring, Floor Covering and Miscellaneous Materials and Assemblies.

1.3 SUBMITTALS

.1 Submit control submittals in accordance with Section 01 33 00 - Submittal Procedures.

.2 Submit verification to demonstrate compliance with CAN/ULCS102 and CAN/ULCS102.2.

.3 Submit proof that carpet has been tested and passed the Indoor Air Quality (IAQ) Carpet Testing Program requirements of the Carpet and Rug Institute (CRI) and the Canadian Carpet Institute (CCI).

.4 Submit report verifying that tuft bind meets requirements of CAN/CGSB-4.129 when tested to CAN/CGSB-4.2 No.77.1.

.5 Submit report outlining proposed dust control measures.

.6 Submit carpet schedule using same room designations indicated on drawings.

.7 Submit carpet manufacturer's installation instructions: Indicate special procedures and perimeter conditions requiring special attention.

.8 Submit certification and description of carpet recycling process

1.4 PRODUCT DATA

.1 Submit product data in accordance with Section 01 33 00 - Submittal Procedures.

.2 Submit product data sheet for each carpet, undercushion, adhesive, carpet protection and subfloor patching compound.

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.3 Submit WHMIS MSDS - Material Safety Data Sheets acceptable to Labour Canada and Health Canada for carpet adhesive and seam adhesive. Indicate VOC content.

.4 Submit data on specified products, describing physical and performance characteristics, sizes, patterns, colours, and methods of installation.

1.5 SHOP DRAWINGS

.1 Submit shop drawings in accordance with Section 01 33 00 - Submittal Procedures.

.2 Indicate locations and lengths of seams for carpeted areas.

.3 Indicate nap direction, open edges, special patterns, and other details required by Consultant to clarify work.

.4 Submit drawings showing columns, doorways, enclosing walls or partitions, built-in cabinets, and locations where cut-outs are required as well as direction of carpet pile and pattern, location of edge mouldings and edge bindings to Consultant for review prior to installation of carpet.

1.6 SAMPLES

.1 Submit samples in accordance with Section 01 33 00 - Submittal Procedures.

.2 Submit duplicate 225 x 225 mm pieces for each colour selected, 300 mm square pieces of under-cushion, 150 mm lengths of carpet gripper and binder bars, base, divider strips.

1.7 CLOSEOUT SUBMITTALS

.1 Submit operation and maintenance data for incorporation into manual specified in Section 01 78 00 - Closeout Submittals.

.2 Submit maintenance data: Include maintenance procedures, recommendations for maintenance materials and equipment, and suggested schedule for cleaning.

.3 Schedule of carpet reclamation activities indicating following:

.1 Detailed sequence of removal work.

.2 Inventory of items to be removed and reclaimed.

.3 Proposed packing and transportation measures.

.4 Certification: Reclamation Agency to verify in writing that used carpet was removed and recycled in accordance with carpet manufacturers' reclamation program.

.1 Record off-site removal of debris and materials and provide following information regarding removed materials.

.1 Time and date of removal.

.2 Type of material.

.3 Weight and quantity of materials.

.4 Final destination of materials.

□

1.8 QUALIFICATIONS

.1 Installer Qualifications:

.1 Flooring contractor requirements.

.1 Specialty contractor normally engaged in this type of work, with prior experience in installation of these types of materials.

.2 Certified by carpet manufacturer prior to [tender] [bid] submission.

.3 Must not sub-contract labour without written approval of Consultant.

.2 Be responsible for proper product installation, including floor testing and preparation as specified and in accordance with carpet manufacturers written instructions.

1.9 REGULATORY REQUIREMENTS

.1 Prequalification: tested to CAN/CGSB-4.2-No.27.6.

.2 Indoor Air Quality: compliance with CRI/CCI Green Label Indoor Air Quality Program, CRI/CCI-IAQ requirements for maximum total volatile chemicals released into air. Label each carpet product with CRI/CCI-IAQ label.

1.10 DELIVERY, STORAGE AND HANDLING

.1 Label packaged materials. For carpet tile products indicate nominal dimensions of tile and indicate installation direction.

.2 Packaging, labelling, packing and marking details.

.3 Store packaged materials in original containers or wrapping with manufacturer's seals and labels intact.

.4 Store carpeting and accessories in location as directed by Consultant. Store carpet and adhesive at minimum temperature of 18^{o}C and relative humidity of maximum 65% for minimum of 48 hours before installation.

.5 Prevent damage to materials during handling and storage. Keep materials under cover and free from dampness.

.6 Store materials in area of installation for minimum period of 48 hours prior to installation.

.7 Modular carpet: store on pallet form as supplied by Manufacturer. Do not stack pallets.

1.11 WASTE MANAGEMENT AND DISPOSAL

.1 Remove from site and dispose of packaging materials at appropriate recycling facilities.

.2 Vacuum used carpet before removal.

.3 Maintain possession of removed used carpet.

□

.4 Carpet undercushion: provide recycling of carpet padding where locally available or as designated by carpet reclamation program.

1.12 ENVIRONMENTAL REQUIREMENTS

.1 Moisture: Ensure substrate is within moisture limits and alkalinity limits prescribed by manufacturer. Prepare moisture testing and provide report to Consultant

.2 Temperature: Maintain ambient temperature of not less than 18 ^{o}C from 48 hours before installation to at least 48 hours after completion of work.

.3 Relative humidity: Maintain relative humidity between 10 and 65% RH for 48 hours before, during and 48 hours after installation.

.4 Safety: Comply with requirements of Workplace Hazardous Materials Information System (WHMIS) regarding use, handling, storage, and disposal of hazardous materials.

.5 Ventilation:

.1 Ventilate area of work as directed by Consultant by use of approved portable supply and exhaust fans.

.2 Ventilate enclosed spaces in accordance with Section 01 51 00 - Temporary Utilities. Provide fans with HEPA filters.

.3 Provide continuous ventilation during and after carpet application. Run ventilation system 24 hours per day during installation; provide continuous ventilation for 7 days after completion of carpet installation.

.6 Test existing floor levelling compound for presence of asbestos contamination. Notify Consultant for additional instructions where asbestos is discovered.

.7 Do not install carpet until space is enclosed and weatherproof, wet-work in space is completed and nominally dry, work above ceilings is complete.

1.13 EXTRA MATERIALS

.1 Provide extra materials of carpet, carpet base, and adhesives in accordance with Section 01 78 00 - Closeout Submittals.

.2 Provide 20 m^2 of each colour, pattern and type of carpeting.

.3 Extra materials to be from same production run as installed materials.

.4 Identify each package of carpet and each container of adhesive.

.5 Deliver to Consultant and store where directed by Consultant.

□

Part 2 Products

2.1 MANUFACTURERS

.1 Certified to Carpet and Rug Institute's and the Canadian Carpet Institute IAQ requirements.

2.2 CARPET TILE (CPT) – Carpet Tiles

Product shall be suitable for direct glue-down installation as per CGSB-4-SP-156. The consultant may select <u>any</u> of the following styles from one of the manufacturers listed below.

1. Interface Open Air 404

1.1.1 All carpet supplied for each installation shall be manufactured from yarn of the same dye lot. Carpet will be selected by the Project Manager or Board Designee from Manufacturer's stock colour and pattern range.

1.1.2 'NEW' CARPET PRODUCTS

When requested, and if time allows, new carpet products other than those indicated above, to be considered, must be submitted to the School Board along with specification sheets and samples. If samples are deemed appropriate for further testing and approval, the Board will require an installation at a School Board site for sampling. The site sample installation to be provided and installed free of charge and to be left on site for a set period of time to be arranged and agreed to at the time of installation. The decision to accept any samples provided for future use within the Board is at the sole and unfettered discretion of the Board.

The Board may award the supply and installation of specialty products other than those noted within the specifications at its sole and unfettered discretion.

1.1.3 WARRANTY

Carpet and installation shall carry a minimum Manufacturer’s ten (10) year warranty.

1.1.4 ADHESIVES

Use Manufacturers recommended adhesive. Provide with bid submission all adhesive products MSDS. Failure to provide MSDS information **<u>MAY</u>** result in the rejection of the bid.

<u>IMPORTANT: Spraying of adhesive will not be accepted</u>.

1.1.5 INSTALLATION

All carpet to be installed as per Manufactures instructions (latest editions/amendments) and in accordance with good installation practices.

<u>IMPORTANT: Spraying of adhesive will not be accepted</u>.

□

Carpet shall be of maximum widths and lengths, with all pile running the same direction, free from end joints in a run and with a minimum of side seams. Side seams shall be parallel to each other.

Where variations of colour within normal textile tolerance occur (i.e. more than two (2) variations of colours within a given room), the change in colour shall be restricted to between individual classrooms and/or designated rooms, with such changes occurring at the door line unless authorized in writing to do otherwise by the School Board. No rooms shall have two (2) variations of the same colour and pattern within its boundaries, unless written authority from the School Board.

Carpeting shall be wall to wall, where carpet meets vinyl tile or other surfaces of less thickness, a carpet to resilient adapter as manufactured by Johnsonite or Schluter, compatible with the decor, shall be installed, using mechanical fasteners, plastic plugs and screws or concrete nails. Do not use powder actuated devices. Carpet shall neatly follow line of walls, bulkheads, columns and door framing.

At openings, seams to occur under door edges.

1.1.6 SEAMS

End seams arzfe generally not acceptable. However where such seams can be so located that they are hidden from view or are otherwise inconspicuous, Project Manager or Board Designee may permit an exception.

.1

.2 Carpet: to CAN/CGSB-4.129 and as follows.

- .1 Certified for flammability to Health Canada regulations under "Hazardous Products (Carpet) Regulations", Part II of the Schedule.
- .2 Maximum flame spread rating 300, maximum smoke developed classification 500, when tested to CAN/ULC-S102.2 .
- .3 Certified to Carpet and Rug Institute's and the Canadian Carpet Institute's IAQ requirements.
- .4 Performance rating: to ASTM D5252 or ASTM D5417.

.3 Construction: woven.

.4 Pile fibre: to CAN/CGSB-4.129.

- .1 Nylon: BCF.
  - .1 Type: Nylon 6.6.

.5 Colourfastness to light: to CAN/CGSB-4.2No.18.3.

.6 Colour Fastness to Atmospheric Fading: to AATCC 129 and AATCC 23.

.7 Tufted Carpet backing: to CAN/CGSB-4.129.

.8 Colour Fastness to Atmospheric Fading: to AATCC 129 and AATCC 23.

□

.9 Lamination Strength of Secondary Backing: to ASTM D3936, minimum acceptable peel strength of [7.4] kg/25 mm.

.10 Tear Strength: to ASTM D2661, minimum acceptable tear strength in both length and width to be:

.1 11.3 kg for carpets to be installed by glue down installation.

.2 15.9 kg for carpet to be installed by power stretch.

.11 Permanent static control: to AATCC 134, 3000V maximum at 20%RH and 22°C.

.12 Anti-microbial: to AATCC 174, 99% reduction, 0% growth.

.13 Stain resistance: to AATCC 175, [8].

2.3 ACCESSORIES

.1 Base:

.1 Carpet base: 100 mm high, same material, colour, pattern and texture as adjoining carpet. Bound edge. Vinyl cap strip to accommodate carpet base thickness, colour to match carpet.

.2 Carpet tackstrips: types recommended by carpet manufacturer.

.3 Seaming tape: types recommended by carpet manufacturer for purpose intended.

.4 Seaming sealer adhesive: type recommended by carpet manufacturer for purpose intended.

.5 Binder bars: aluminum

.6 Adhesive:

.1 Multi-purpose adhesive type: recommended by carpet manufacturer for direct glue down installation.

.2 Pressure sensitive type: recommended by carpet manufacturer for direct glue down installation of modular carpet or speciality backed carpets.

.7 Carpet protection: non-staining heavy duty kraft paper.

.8 Concrete floor sealer: to CAN/CGSB-25.20, Type 1.

.9 Subfloor patching compound: Portland cement base filler, mix with latex and water to form a cementitious paste.

Part 3 Execution

3.1 SUB-FLOOR TREATMENT

.1 Concrete shall be inspected to determine special care required to make it a suitable foundation for carpet. Cracks [3] mm wide or protrusions over [0.8] mm will be filled and levelled with appropriate and compatible [latex] [polymer fortified] patching compound.

□

.2 Do not exceed manufacturer's recommendations for patch thickness.

.3 Large patch areas are to primed with a compatible primer.

.4 Concrete substrates shall be cured, clean and dry.

.5 Concrete substrates shall be free of paint, dirt, grease, oil, curing or parting agents, and other contaminates, including sealers, that may interfere with the bonding of the adhesive.

.6 Wherever a powdery or porous concrete surface is encountered, a primer compatible with the adhesive shall be used to provide a suitable surface for glue-down installation.

3.2 PREPARATION

.1 Prepare floor surfaces in accordance with CRI 104 Standard for Installation of Commercial Carpet.

.2 Pre-condition carpeting following manufacturer's printed instructions.

3.3 INSTALLATION

.1 Install carpeting and undercushion using minimum of pieces.

.2 Install in accordance with manufacturer's printed instructions and in accordance with Carpet and Rug Institute Standard for Installation of Commercial Carpet, CRI 104.

.3 Install carpet and undercushion after finishing work is completed but before demountable office partitions and telephone and electrical pedestal outlets are installed.

.4 Finish installation to present smooth wearing surface free from conspicuous seams, burring and other faults.

.5 Use material from same dye lot. Ensure colour, pattern and texture match within any one visual area. Maintain constant pile direction.

.6 [Hot melt] [Adhesive] seams and cross-joints. Seam edges must be sealed.

.7 Fit neatly around architectural, mechanical, electrical and telephone outlets, and furniture fitments, around perimeter of rooms into recesses, and around projections.

.8 Install carpeting to underfloor duct system and to access covers.

.9 Install carpeting in pan type floor access covers.

.10 Extend carpet into toe spaces, door reveals, closets, open-bottomed obstructions, removable flanges, alcoves, and similar openings.

.11 Install carpet smooth and free of bubbles, puckers, and other defects.

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3.4 CARPET TACKSTRIPS AND BINDER BARS

.1 Install carpet grippers at junctions of walls and vertical surfaces. Secure gripper to prevent movement.

.2 Install binder bars at exposed carpet edges and centre under doors in door openings.

3.5 UNDERCUSHION INSTALLATION

.1 Install undercushion fully adhered using minimum number of pieces. Secure undercushion to prevent shifting.

.2 Butt edges firmly together. Install to edge of gripper and tape top of joints. Remove bubbles and slightly stretch.

.3 Secure undercushion at projections and penetrations, and where cut to contours and ramps.

.4 Offset undercushion seams at least 300 mm from carpet seams.

3.6 DIRECT GLUE DOWN CARPET

.1 Apply adhesive and install carpeting over undercushion in accordance with manufacturer's written instructions, by direct glue-down method.

3.7 STRETCH-IN CARPET

.1 Install carpeting over undercushion and secure at carpet grippers in accordance with manufacturer's written instructions.

3.8 SEAMS

.1 Seal edges of cut-outs with binding method.

.2 Carpet visibility of seams and joints to acceptable industry standards.

3.9 BASE INSTALLATION

.1 Install bound edge carpet base to match adjacent carpeting.

.2 Attach carpet to wall with adhesive. Neatly fit against floor carpet and into cap strip.

.3 Extend floor carpeting over cove, up wall and into capstrip to form cove carpet base.

.4 Install resilient base in accordance with Section 09 65 19.

3.10 PROTECTION OF FINISHED WORK

.1 Vacuum carpets clean immediately after completion of installation. Protect traffic areas.

.2 Prohibit traffic on carpet for a period of 24 hours until adhesive is cured.

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.3 Install carpet protection to satisfaction of Consultant.

END OF SECTION

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Part 1 General

1.1 RELATED SECTIONS

.1 Section 01 33 00 - Submittal Procedures.

.2 Section 01 78 00 - Closeout Submittals.

.3 Section 09 22 16 - Non-structural Metal Framing.

.4 Section 06 10 10 - Rough Carpentry: Wood strapping.

.5 Section 09 51 13 – Acoustic panel Ceiling.

.6 Section 04 21 13 – Masonry.

.7 Section 06 40 00 – Architectural Woodwork.

1.2 REFERENCES

.1 American Society for Testing and Materials (ASTM International)

.1 ASTM C423-[01], Test Method for Sound Absorption and Sound Absorption Coefficients by the Reverberation Room Method.

.2 Canadian General Standards Board (CGSB)

.1 CAN/CGSB-51.34-[M86], Vapour Barrier, Polyethylene Sheet for Use in Building Construction.

.2 CAN/CGSB-92.1-[M89], Sound Absorptive Prefabricated Acoustical Units.

.3 Canadian Standards Association (CSA International)

.1 CSA B111-[1974(R1998)], Wire Nails, Spikes and Staples.

.4 Underwriter Laboratories of Canada (ULC)

.1 CAN/ULC-S702-[97], Thermal Insulation, Mineral Fibre, for Buildings.

1.3 SAMPLES

.1 Submit samples in accordance with Section 01 33 00 - Submittal Procedures.

.2 Submit one 300 x 300 sample of acoustic panel.

1.4 ENVIRONMENTAL REQUIREMENTS

.1 Commence installation after building enclosed and dust generating activities are completed.

.2 Permit wet work to dry prior to commencement of installation.

.3 Maintain uniform minimum temperature of 15°C and relative humidity of 20- 40% prior to, during and after installation.

□

1.5 WASTE MANAGEMENT

.1 Remove from site and dispose of packaging materials at appropriate recycling facilities.

.2 Collect and separate for disposal paper, plastic, polystyrene, and corrugated cardboard, packaging material in appropriate on-site bins for recycling.

1.6 EXTRA MATERIALS

.1 Provide acoustical units for maintenance use amounting to 2% of gross wall area for each pattern and type required for project.

.2 Provide sufficient adhesive to install extra material provided.

.3 Extra materials to be from same production run as installed materials.

.4 Clearly identify each package of acoustical units including colour and type, and each container of adhesive.

.5 Store where directed by Consultant.

Part 2 Products

2.1 MATERIALS

.1 <u>Type 1: Fabric Acoustic Panels (FAB):</u>

.1 Supply and install surface mounted panels for use in Library.
.2 Acoustical construction products must:
  .1 Not require being labelled as poisonous, corrosive, flammable or explosive under the Consumer Chemical and Container Regulations of the Hazardous Products Act.
  .2 Be accompanied by detailed instructions for proper handling and installation so as to minimize health concerns.
.3 Composition: Fiberglass with resin-hardened edges with 25% recycled content.
.4 Panels shall be square edged with mechanical butt joints. A Flame Spread rating shall not exceed 25 and NRC-0.80 in accordance with ASTM C423.
.5 Finish: Fabric finish in three colours to be selected by Consultant from Manufacturer's standard colour range.
.6 Panel size: As indicated on drawings.
.7 Mounting method: Z-clips.
.8 Acoustic Insulation: CAN/ULC S702; 63 mm thick acoustic insulation "Fiberglass Noise Stop Blanket".
.9 Screws: Non corrosive finish, type recommended by acoustic unit manufacturer.
.10 'Soundsoak' by Armstrong (Contact: Ruth Shannon) or 'Acoustical Panel' by Decoustics, Wallworks 'Fabri-Lok' Tensioned Fabric System (Contact Darcey Jerrom 877 829-2550 Ext. 35), Conwed by Owens Corning, AP Impact Acoustical Panels by Sound Concepts or approved alternative manufacturer.

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.2 Type 2: Solid Acoustic "Sound Blocks" (SAB)

.1 Armstrong Fabric Wall Barrel Diffusers 5379WMFR: 200 x 600 x 600.
.2 Approved alternate: Kinetics Noise Controls Geometric Diffusers; Pyramidal diffusers in 508 x 508 wrapped in Guildford of Maine FR701-2100, and by Sound Seal (dist. by Wallworks Acoustic Arch. Products 647 808-5450), Interact Barrel Diffusers by Sound Concepts, and Conwed Fabric covered diffusers by Owns Corning.
.3 Colour: Two colours shall be selected by Consultant from Manufacturer's standard colour range.
.4 Location: Music and Art Classrooms.

.3 Type 3: Wood Grille Acoustic Panels (WG or WGA)

.1 Solid wood dowel acoustic panels.
.2 Overall Panel sizes: as indicated on drawings.
.3 Attachment method: Wall splines or z-clips.
.4 Acceptable Product: 'WOODWORKS® Grille' Model 7099 by Armstrong
.5 Connection type: Dowel Only
.6 Slat width: 1-1/4"
.7 Slat height/depth: 5-1/4"
.8 Slat spacing: 3 slats - 2-3/4"
.9 Nominal unit size: 12 x 96 x 5-1/4"
.10 Finish: Walnut or maple
.11 Alternates meeting these specifications, including Wood Grille Systems by ACGI Wood meeting required width, height and spacing noted above as distributed by Rieger Architectural Products (contact Christina Rieger).
.12 Location: locations noted on drawings.

.4 Type 4: Tectum Acoustic Panels (TEC)

.1 Use only undamaged, single pieces of 600 mm x 2400 mm nom. x 25 mm thick Tectum board. Material shall be ULC rated for fuel contributed, flame spread and smoke development in compliance with Ontario Building Code.
.2 Locations: to upper walls of Gymnasium, Applications Classroom 206 and Collaborative Learning 201. Refer to AD Drawings and Interior Elevations.
.3 Colour: pre-painted a custom colour to Architect's selection; installed with wood trim by Section 06 40 00.
.4 Acceptable alternate: Acoustiplank manufactured by Acoustex (tel: 905-692-0916)
.5 Provide solid maple or birch wood trim with clear satin finish, around perimeter of groupings.

.2 Metal Framing: 64 mm deep metal furring channels

.3 Acoustic Insulation: 63 mm thick acoustic insulation "Fiberglass Noise Stop Blanket".

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Part 3 Execution

3.1 EXAMINATION

.1 Examine carefully surfaces to which panels will be attached and report defects to the Architect. Commencement of installation will signify complete acceptance of substrate.

3.2 INSTALLATION OF TECTUM PANELS

1. Fasten metal furring channels to wall at 600 mm O.C. and at perimeter to receive panels, insulation and wood trim. Refer to detail drawings.

2. Install acoustic insulation to suitable friction fit between channels.

3. Fasten Tectum panels, long dimension to the vertical, to furring using suitable self tapping screws at maximum 300 mm O.C.

4. Install wood surround trim. Refer to Section 06 40 00.

3.3 INSTALLATION OF PANELS

1. Fasten zee clips to wall-shim, as required, for level and even appearance.

2. Install insulated panels on clips. Provide vandal resistant fastening and metal trim.

3.4 CLEANING

.1 Keep acoustic installation and all components clean. Remove blemishes immediately.

3.5 PROTECTION

.1 Use cardboard to protect finished acoustical wall treatment from damage.

.2 Remove prior to substantial completion.

END OF SECTION

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Part 1 General

1.1 RELATED SECTIONS

.1 Section 01 33 00 - Submittal Procedures.

.2 Section 06 40 00 - Architectural Woodwork.

.3 Section 05 12 23 – Structural Steel for Buildings.

.4 Section 05 50 00 – Metal Fabrications.

.5 Section 08 11 14 – Metal Doors and Frames.

.6 Section 09 91 27 – Finish and Colour Notes.

.7 Section 09 91 30 – Door and Room Finish Schedule.

1.2 REFERENCES

.1 Architectural Painting Specifications Manual, Master Painters Institute (MPI).

.2 Ontario Painting Contractors Association (OPCA) Architectural Specification Manual - referenced as OPCA Manual, latest Edition. Paint formulations and methods referred to herein refer to this Manual. If contractor is unfamiliar with this reference standard, contact the OPCA at (416) 498-1897.

1.3 WARRANTY

.1 At outset of the contract, contractor to register with the OPCA for the inspection service paid for from Cash Allowances.

.2 Upon completion of the inspection program, contractor to furnish an OPCA 2 Year Guarantee. The Guarantee shall warrant that the work has been performed with respect to the standards and requirements incorporated in the OPCA specification manual-latest edition.

1.4 ENVIRONMENTAL PERFORMANCE REQUIREMENTS

.1 Do not apply paint finish in areas where dust is being generated.

.2 Conform to requirements of OPCA Manual.

.3 Comply with the requirements of Section 01 35 30- Health and Safety.

1.5 JOB MOCK-UP

.1 Complete a mock-up room to be reviewed and approved by Owner, Consultant, and OPCA Inspector for approval on application of block filler and finish paint coats.

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1.6 SCHEDULING OF WORK

.1 Submit work schedule for various stages of painting to Consultant for approval. Submit schedule minimum of 72 hours in advance of proposed operations.

.2 Obtain written authorization from Consultant for any changes in work schedule.

.3 Schedule painting operations to prevent disruption of occupants in and about the building.

1.7 EXTRA MATERIALS

.1 Submit one - four litre can of each type and colour of [primer] [stain] [finish coating]. Identify colour and paint type in relation to established colour schedule and finish system.

.2 Deliver to Contractor and store where directed.

1.8 DELIVERY, HANDLING AND STORAGE

.1 Labels shall clearly 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.

.2 Remove damaged, opened and rejected materials from site.

.3 Provide and maintain dry, temperature controlled, secure storage.

.4 Observe manufacturer's recommendations for storage and handling.

.5 Store materials and supplies away from heat generating devices.

.6 Store materials and equipment in a well ventilated area with temperature range 7^0C to 30^0C.

.7 Store temperature sensitive products above minimum temperature as recommended by manufacturer.

.8 Keep areas used for storage, cleaning and preparation, clean and orderly to approval of Consultant. After completion of operations, return areas to clean condition to approval of Consultant.

.9 Remove paint materials from storage only in quantities required for same day use.

.10 Comply with requirements of Workplace Hazardous Materials Information System (WHMIS) regarding use, handling storage, and disposal of hazardous materials.

.11 Fire Safety Requirements:

.1 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.

.2 Handle, store, use and dispose of flammable and combustible materials in accordance with the National Fire Code of Canada.

1.9 FINISHES AND COLOURS

.1 Review the requirements outlined in Section 099127, Finish Schedule and Colour Notes. A separate colour schedule will be issued after contract award.

.2 Allow for 12 colours total from all formulations for this project including room wall accent colours.

1.10 WASTE MANAGEMENT AND DISPOSAL

.1 Paint, stain and wood preservative finishes and related materials (thinners, solvents, etc.,) are regarded as hazardous products and are subject to regulations for disposal. Information on these controls can be obtained from Provincial Ministries of Environment and Regional levels of Government.

.2 Material which cannot be reused must be treated as hazardous waste and disposed of in an appropriate manner.

.3 Place materials defined as hazardous or toxic waste, including used sealant and adhesive tubes and containers, in containers or areas designated for hazardous waste.

.4 To reduce the amount of contaminants entering waterways, sanitary/storm drain systems or into ground the following procedures shall be strictly adhered to:

.1 Retain cleaning water for water-based materials to allow sediments to be filtered out.

.2 Retain cleaners, thinners, solvents and excess paint and place in designated containers and ensure proper disposal.

.3 Return solvent and oil soaked rags used during painting operations for contaminant recovery, proper disposal, or appropriate cleaning and laundering.

.4 Dispose of contaminants in an approved legal manner in accordance with hazardous waste regulations.

.5 Empty paint cans are to be dry prior to disposal or recycling (where available).

.5 Where paint recycling is available, collect waste paint by type and provide for delivery to recycling or collection facility.

.6 Set aside and protect surplus and uncontaminated finish materials: galvanized touch up; wood stain, prefinished metal touch up paint. Deliver to or arrange collection by recycling organization for verifiable re-use or re-manufacturing.

.7 Close and seal tightly partly used sealant and adhesive containers and store protected in well ventilated fire-safe area at moderate temperature.

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Part 2 Products

2.1 MATERIALS

.1 Acceptable Manufacturer's: Where OPCA code numbers are not referenced, use Products from one of the following manufacturers:

.1 Benjamin Moore & Co. Ltd.
.2 ICI (Glidden) Paints.
.3 Para Paints.
.4 Pratt & Lambert Inc.
.5 The Sherwin-Williams Company.

.2 Manufacturers of intumescent coatings having Product considered acceptable for use:

.1 A/D Fire Protection Systems Inc.
.2 Carboline.

.3 Paint materials for paint systems shall be products of a single manufacturer.

.4 Acceptable products: Per Chapter 5 OPCA Manual and as listed.

.5 Paint materials for each paint system to be products of a single manufacturer.

.6 Use low-VOC and low-odour paints only.

Part 3 Execution

3.1 GENERAL

.1 Prepare surfaces to receive paint per Chapter 3 OPCA Manual.

.2 For doors supplied by Relocatable Contractor as indicated in the Door Finish schedule, clean and re-prime all surfaces prior to painting. Refer to AD drawings for Door Finish Schedule.

3.2 APPLICATION

.1 Sand and dust between each coat to remove defects visible from distance up to 1.5 m.

.2 Finish closets and alcoves as specified for adjoining rooms.

.3 Apply each coat at the proper consistency. Each coat of finish should be fully dry and hard before applying the next coat, unless the manufacturer's instructions state otherwise.

.4 Method of application to be as approved by Consultant. Apply paint by [brush] [roller] [air sprayer] [airless sprayer]. Conform to manufacturer's application instructions unless specified otherwise.

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.5 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.

.6 Spray application:

.1 Provide and maintain equipment that is suitable for intended purpose, capable of properly 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 a uniform layer, with overlapping at edges of spray pattern.

.4 Brush out immediately all runs and sags.

.5 Use brushes to work paint into cracks, crevices and places which are not adequately painted by spray.

.7 Use dipping, sheepskins or daubers only when no other method is practical in places of difficult access and only when specifically authorized by Consultant.

.8 Apply coats of paint as a continuous film of uniform thickness. Repaint thin spots or bare areas before next coat of paint is applied.

.9 Allow surfaces to dry and properly cure after cleaning and between subsequent coats for minimum time period as recommended by manufacturer.

.10 Sand and dust between coats to remove visible defects.

.11 Finish surfaces both above and below sight lines as specified for surrounding surfaces, including such surfaces as tops of interior cupboards and cabinets and projecting ledges.

.12 Finish inside of cupboards and cabinets as specified for outside surfaces.

.13 Finish closets and alcoves as specified for adjoining rooms.

.14 Finish top, bottom, edges and cut-outs of doors after fitting as specified for door surfaces.

3.3 MECHANICAL/ELECTRICAL EQUIPMENT

.1 Refer also to Finish Notes in Section 099127- Finish and Colour Notes.

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.2 Paint exposed conduits, pipes, hangers and other mechanical and electrical equipment occurring in finished areas as well as inside cupboards and cabinet work. Colour and texture to match adjacent surfaces, except as noted otherwise. Coordinate with mechanical trades applying banding and labeling after pipes have been painted. Do not paint white PVC covers on exposed mechanical water, drain and other lines

.3 Paint gas piping standard yellow where visible on roof or in service spaces. Do not paint gas meter or gas equipment in wall niche yellow—colour to later selection by Architect.

.4 Paint surfaces inside of ductwork and elsewhere behind grilles where visible using primer and one coat of matte black paint.

.5 Paint both sides and edges of plywood backboards for equipment before installation.

.6 Leave equipment in original finish except for touch-up as required, and paint conduits, mounting accessories and other unfinished items.

3.4 PAINT SYSTEMS

.1 System references listed are based on Chapters 4A and 4B of OPCA Manual and are OPCA Premium Grade, unless noted otherwise.

3.5 INTERIOR FINISHES

.1 Wood, where applicable:

- .1 Doors, miscellaneous trim: INT. 1-A, Alkyd Semi-Gloss Finish, Premium Grade
- .2 Wood slat ceiling to Foyer: INT. 1-J Premium Grade; satin finish, Fire Retardent. Slats to be sealed and shop finished prior to installation. Refer also to Section 064000.
- .3 Casework and miscellaneous wood items:
  - .1 Exterior surfaces: INT. 1-A, Alkyd Semi-Gloss Finish, Premium Grade
  - .2 Interior surfaces: INT. 1-A, Alkyd Semi-Gloss Finish, Premium Grade
  - .3 Wood Benches and Upper Shelves: INT. 2-F, Stained Alkyd Satin Finish, Premium Grade.
  - .4 Gym Storage Shelves: INT. 3-A, Stain Finish, Custom Grade

.2 Gypsum board: INT.4-B, Latex Eggshell Finish, Premium Grade.

.3 Acoustical wall panels: INT. 6-A, Latex Flat Finish, Custom Grade.

.4 Concrete Block: INT.8-C -modified; Latex Semi-Gloss Finish, Premium Grade. Modified system refers to all work where 2 full coats of block filler shall be applied.

.5 Concrete Block: Alkyd Gloss Finish, Premium Grade - shown on Room Finish Schedule as P-GF (Paint - Gloss) finish.

.6 Concrete Floors; refer to Section 03 35 05- Concrete Floor Hardeners and Sealers for liquid sealer.

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.7 Exposed Cast in Place Concrete ceilings: INT. 8-A, Latex Flat Finish, Premium Grade

.8 Exposed Precast Concrete ceilings: INT. 8-A, Latex Flat Finish, Custom Grade

.9 Miscellaneous metal:

.1 Primed: INT. 12-A, Alkyd Semi-Gloss Finish, Premium Grade

.2 Galvanized: INT. 13-A, Alkyd Semi-Gloss Finish, Premium Grade

.3 INT. 12-G, Water based Epoxy finish, two coats on a rust inhibitive primer for all exposed steel on Stairs 1S1 & 1S2 including exposed steel nosing at porcelain tile stair landing, stair stringer, pickets and railings".

.10 Galvanized metal: INT. 13-A, Alkyd Semi-Gloss Finish, Premium Grade

.11 Hollow Metal Doors and Frames: Without exception, all wipecoated Galvanized Hollow Metal Doors, Frames and Screens, interior and exterior shall be field cleaned with solvent, galvanized prime paint coated and then finished with INT. 13-A Premium Grade, Gloss Finish. Base coat primer shall be submitted for review in advance or door/frame painting shall be rejected by Consultant. For exterior hollow metal frames, if any, adjacent to aluminum windows, provide finish coat as an exterior premium grade metallic gloss finish to match anodized windows or Aluminum Composite panels. Colour to be confirmed by Architect during construction.

.12 Gymnasium Painting:

.1 note that painting of gymnasium acoustic deck and structural steel is part of painting contract.

.2 Allow for single colour for deck and joists.

.3 Allow for complete painting of all hangers and equipment brackets including but not limited to basketball baskstops, electrical pipe rails, mechanical equipment fan cages, etc.

.4 Allow for accent painting of 2 perimeter stripes to all walls and over proscenium, shown on drawings. Total of 2 accent colours for these stripes.

.13 Mural in Corridor:

.1 Provide line painting mural in Corridor 140 as described on drawing 64/A17.

.2 Additional information may be provided during construction, if required. Colours to be selected from the 12 colours including in contract.

.14 Other Painting:

.1 Painting of Elevator/Lift doors and frame is part of this contract.

.2 In rooms with exposed metal deck:

.1 Allow for single colour for deck and joists.

.2 Allow for complete painting of all hangers and equipment brackets including but not limited to, electrical and mechanical equipment, etc.

.3 painting deck/floor slab and structural steel is part of painting contract.

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3.6 EXTERIOR PAINTING

.1 Steel columns at front entrance: EXT. 6F, Two component epoxy finish, Premium Grade. Custom colour.

.2 Miscellaneous metal:

- .1 Primed: EXT. 11-A-Gloss, Premium Grade
- .2 Galvanized: Touch up any welds, cuts or damage with 'Galvafroid' Paint by W.R. Meadows prior to prime and finish coats.; Finish System EXT. 12-A-Gloss, Premium Grade

.3 Galvanized Structural Steel: Touch up any welds, cuts or damage with 'Galvafroid' Paint by W.R. Meadows prior to prime and finish coats.; Finish System: EXT. 12-A-Gloss, Premium Grade.

.4 Steel - high heat: EXT. 15-A

3.7 INSPECTIONS

.1 Register with OPCA at the outset of the project.

.2 Provide Architect with all formulations at outset of project.

.3 Provide inspections by representative of the Ontario Painting Contractors Association (OPCA) in compliance with the terms of the Canadian Painting Contractors Association Inspection and Guarantee Program.

.4 Cooperate at all times with the paint inspection agency in the performance of their duties as required as part of the work of this Section.

.5 OPCA inspection costs to be paid from Cash Allowance.

END OF SECTION

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Part 1 General

1.1 GENERAL FINISH NOTES

.1 The Material and Colour Schedule will be issued by the Consultant after tender. It shall be read in conjunction with the Drawings, Specifications, Room Schedule and Door Schedule. Colour and material references named will be based on one manufacturer, as carried by the Contractor or, in the case that no specific manufacturer is carried, based on the Consultant's choice.

.2 Approved alternative manufacturers will be acceptable only as indicated in the specifications. However, approved alternate products submitted must match the products named in the Specification to the Consultant's selection. Alternate products other than those named in the specifications will not be allowed unless previously approved by the Consultant.

.3 Consult Consultant prior to painting any surface not included in the formulae as listed.

.4 Final colour for exterior painted surfaces and prominent interior areas shall be approved on the job site by the Consultant.

.5 Paint samples: Contractor to submit paint samples for all areas required to "Match Adjacent Finish".

.6 All similar paint formulations are to be identical when dry. Variations in tone, texture or sheen shall not be accepted.

.7 Submit two 300 mm x 300 mm paint samples of each colour required for approval by the Architect.

.8 Exact locations of accent paint called for in the Material and Colour Schedule, to be issued after Contract award, not specifically identified on the drawings are to be verified on site with the Consultant.

1.2 EXTERIOR FINISH NOTES

.1 All exposed metal (doors, frames, lintels, stairs, handrails, mechanical equipment, etc.) to be painted except for prefinished metal louvres, stainless steel, and aluminum. Mechanical equipment is to be painted whether delivered to the site prepainted or not (exhaust fans, goosenecks, exhaust stacks, supports, HVAC units, HRU units, etc.). Colours to match adjacent material-generally either to match brick or tan to match flashing or siding material. Do not paint exposed white PVC pipe covers on interior. Architect will advise on jobsite which other items mentioned above, if any, do not require painting.

.2 All unfinished metal work provided by landscaping is to be painted by Section 099122-Painting.

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1.3 INTERIOR FINISH NOTES

.1 All heating units, recessed convectors, grilles, pipes, access panels, hangers and miscellaneous exposed metal work (except stainless steel or anodized aluminum) to be painted to match the surfaces on which they occur unless noted otherwise on the colour schedule, prefinished in suitable colour or directed by the Consultant. If prefinished equipment is damaged, it shall be re-painted. Painting to be by formulations specified in Section 09 91 12- Painting.

.2 All interior fitments, casework, millwork, etc. to be melamine unless otherwise noted. Refer to Sections for specific requirements regarding materials, construction, finishes and hardware. Note that drawer and cupboard interiors are to be considered as exposed surfaces and will therefore be finished.

.3 Do not paint over nameplates, identification tags, etc.

.4 Make good all existing surfaces and finishes that are damaged during construction.

END OF SECTION

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ROOM FINISH SCHEDULE		FLOOR		WALL		CEILING			REMARKS
NO.	NAME	FIN.	BASE	MAT'L	FIN.	MAT'L	FIN.	HEIGHT(mm)	
GROUND FLOOR									
101	VESTIBULE	POR	POR	CB	P/MV	EXP	P	-	PAINT STRUCTURE INCL. MECH. DUCTS, SUPPORTS, CONDUIT ETC. REFER TO INT. ELEVATIONS.
102	STUDENT FORUM	POR	POR	CB/GWB	P/MV/ WG	EXP ASD/ ACP	-	-	REFER TO RCP. GLULAM BEAMS TO BE UNPAINTED. ACOUSTIC DECK TO BE PREFINISHED WHITE. PAINT CONDUITS, SUPPORTS ETC. WHITE SAME AS DECK. MECH DUCTS TO BE PAINTED COLOUR SELECTED BY ARCHITECT
103	LEARNING COMMONS	CPT	RR	CB/GWB	P/MV/ FAB	EXP ASD	-	-	GLULAM BEAMS TO BE UNPAINTED. ACOUSTIC DECK TO BE PREFINISHED WHITE. PAINT CONDUITS, SUPPORTS ETC. WHITE SAME AS DECK. MECH DUCTS TO BE PAINTED COLOUR SELECTED BY ARCHITECT. REFER TO INT. ELEVATIONS.
104	WORKROOM	CPT	RR	CB	P	LAP	-	2800	
105	CART STORAGE	SF-R	RR	CB	P	EXP	P	-	PAINT STRUCTURE INCL. MECH. DUCTS, SUPPORTS, CONDUIT ETC.
106	OFFICE	SF-R	RR	CB	P	LAP	-	2800	
107	WORKROOM	SF-R	RR	CB	P	LAP	-	2800	
108	OFFICE	CPT	RR	CB	P	LAP	-	2800	
109	MEETING	CPT	RR	CB	P	LAP	-	2800	
110	OFFICE	CPT	RR	CB	P	LAP	-	2800	
111	OSR	SF-R	RR	CB	P	LAP	-	2800	
112	HEALTH	SF-R	RR	CB	P	LAP	P	2800	

ROOM FINISH SCHEDULE		FLOOR		WALL		CEILING			REMARKS
NO.	NAME	FIN.	BASE	MAT'L	FIN.	MAT'L	FIN.	HEIGHT(mm)	
113	WASHROOM	POR	POR	CB	P/CWT	GYP	P	2600	CWT FLOOR TO CEILING. REFER TO INTERIOR ELEVATION FOR LOCATION OF CWT.
114	STORAGE	SF-R	RR	CB	P	EXP	P	-	PAINT STRUCTURE INCL. MECH. DUCTS, SUPPORTS, CONDUIT ETC.
115	SEMINAR 1	SF-R	RR	CB	P	LAP	-	2800	
116	OFFICE	SF-R	RR	CB	P	LAP	-	2800	
117	RECEIVING/CUSTODIAN	S.CONC	RR	CB	P	EXP	P	-	PAINT STRUCTURE INCL. MECH. DUCTS, SUPPORTS, CONDUIT ETC.
118	ELECTRICAL ROOM	S.CONC	RR	CB	P	EXP	P	-	PAINT STRUCTURE INCL. MECH. DUCTS, SUPPORTS, CONDUIT ETC.
119	SPRINKLER	S.CONC	RR	CB	P	EXP	P	-	PAINT STRUCTURE INCL. MECH. DUCTS, SUPPORTS, CONDUIT ETC.
120	SEMINAR 2	POR	POR	GYP	P	GYP	P	2750	
121	NUTRITION	SF-R	RR	CB	P	LAP	-	2450	
122	STAGE	SF-R	RR	CB/GYP	P	EXP	P	-	PAINT STRUCTURE INCL. MECH. DUCTS, SUPPORTS, CONDUIT ETC.
123	ELEVATOR	POR	REFER TO SPECIFICATIONS FOR FINISHES BY MANUFACTURER						
124	CORRIDOR	POR	POR	CB	P	EXP	P	-	PAINT STRUCTURE INCL. MECH. DUCTS, SUPPORTS, CONDUIT ETC.
125	GYMNASIUM	SF-SP	RR	CB	P	EXP ASD	P	-	ACOUSTIC STEEL DECK. JOISTS TO BE PAINTED DIFFERENT COLOUR THAN ACOUSTIC DECK. PAINT DUCTS, SUPPORTS, CONDUITS, ETC. TO MATCH DECK. CUT IN COLOURED GAME LINES IN FLOOR. ACOUSTIC SOUND BLOCK & TECTUM PANELS - REFER TO INT. ELEVATIONS.

ROOM FINISH SCHEDULE		FLOOR		WALL		CEILING			REMARKS
NO.	NAME	FIN.	BASE	MAT'L	FIN.	MAT'L	FIN.	HEIGHT(mm)	
126	CHANGE ROOM	POR	POR	CB	P/CWT	GYP	P	2600	CWT FLOOR TO CEILING. REFER TO INTERIOR ELEVATION FOR LOCATION OF CWT.
127	CHANGE ROOM	POR	POR	CB	P/CWT	GYP	P	2600	CWT FLOOR TO CEILING. REFER TO INTERIOR ELEVATION FOR LOCATION OF CWT.
128A	GYM STORAGE	S.CONC	RR	CB	P	GYP	P	-	PAINT STRUCTURE INCL. MECH. DUCTS, SUPPORTS, CONDUIT ETC.
128B	GYM STORAGE	S.CONC	RR	CB	P	GYP	P	-	PAINT STRUCTURE INCL. MECH. DUCTS, SUPPORTS, CONDUIT ETC.
129	CORRIDOR	POR	POR	CB	P/MV	LAP/GYP	-	VARIES	REFER TO INTERIOR ELEVATIONS FOR WALL FINISHES. REFER TO REFLECTED CEILING PLAN.
130	CLASSROOM 1	SF-R	RR	CB	P	LAP	-	2800	
131	CLASSROOM 2	SF-R	RR	CB	P	LAP	-	2800	
132	STAIR A	POR	POR	CB	P	LAP/GYP	-	VARIES	REFER TO REFLECTED CEILING PLAN
133	STAFF ROOM	SF-R	RR	CB	P/CWT	LAP	-	2800	CWT BACKSPLASH. REFER TO INTERIOR ELEVATIONS
134	SENSORY	SF-R	RR	CB	P	LAP	P	2800	
135	SAFE	SF-R	RR	CB	P	LAP	P	2800	
136	THERP	SF-R	RR	CB	P	LAP	P	2800	
137	SPECIAL EDUCATION	SF-R	RR	CB	P	LAP	-	2800	
138	BOYS WASHROOM	POR	POR	CB	P/CWT	GYP	P	2600	CWT FLOOR TO CEILING. REFER TO INTERIOR ELEVATION FOR LOCATION OF CWT.
139	GIRLS WASHROOM	POR	POR	CB	P/CWT	GYP	P	2600	CWT FLOOR TO CEILING. REFER TO INTERIOR ELEVATION FOR LOCATION OF CWT.

ROOM FINISH SCHEDULE		FLOOR		WALL		CEILING			REMARKS
NO.	NAME	FIN.	BASE	MAT'L	FIN.	MAT'L	FIN.	HEIGHT(mm)	
140	CORRIDOR	POR	POR	CB	P	LAP/GYP	-	VARIES	REFER TO REFLECTED CEILING PLAN
141	LAN	SF-R	RR	CB	P	EXP	P	-	PAINT STRUCTURE INCL. MECH. DUCTS, SUPPORTS, CONDUIT ETC.
142	UNIVERSAL WASHROOM	POR	POR	CB	P/CWT	GYP	P	2600	CWT FLOOR TO CEILING. REFER TO INTERIOR ELEVATION FOR LOCATION OF CWT.
143	WASHROOM	POR	POR	CB	P/CWT	GYP	P	2600	CWT FLOOR TO CEILING. REFER TO INTERIOR ELEVATION FOR LOCATION OF CWT.
144	WASHROOM	POR	POR	CB	P/CWT	GYP	P	2600	CWT FLOOR TO CEILING. REFER TO INTERIOR ELEVATION FOR LOCATION OF CWT.
145	WORKROOM	SF-R	RR	CB	P	LAP	-	2800	
146	KINDERGARTEN	POR/SF-A	POR/RR	CB	P	LAP	-	2800	REFER TO FLOOR PATTERN LAYOUT.
147	KINDERGARTEN	POR/SF-A	POR/RR	CB	P	LAP	-	2800	REFER TO FLOOR PATTERN LAYOUT.
148	KINDERGARTEN	POR/SF-A	POR/RR	CB	P	LAP	-	2800	REFER TO FLOOR PATTERN LAYOUT.
149	KINDERGARTEN	POR/SF-A	POR/RR	CB	P	LAP	-	2800	REFER TO FLOOR PATTERN LAYOUT.
150	STAIR B	POR	POR	CB	P	LAP/GYP	-	VARIES	REFER TO REFLECTED CEILING PLAN
151	KINDERGARTEN	POR/SF-A	POR/RR	CB	P	LAP	-	2800	REFER TO FLOOR PATTERN LAYOUT.
152	CORRIDOR	POR	POR	CB	P	LAP	-	2800	
153	KINDERGARTEN	POR/SF-A	POR/RR	CB	P	LAP	-	2800	REFER TO FLOOR PATTERN LAYOUT.
154	STORAGE	POR	RR	CB	P	LAP	-	2800	

ROOM FINISH SCHEDULE		FLOOR		WALL		CEILING			REMARKS
NO.	NAME	FIN.	BASE	MAT'L	FIN.	MAT'L	FIN.	HEIGHT(mm)	
155	OUTDOOR STORAGE	S.CONC	RR	CB	P	EXP	P	-	PAINT STRUCTURE INCL. MECH. DUCTS, SUPPORTS, CONDUIT ETC.
156	STAIR C	POR	POR	CB	P	EXP	P	-	PAINT STRUCTURE INCL. MECH. DUCTS, SUPPORTS, CONDUIT ETC.
157	ELEV. MACHINE ROOM	S.CONC	RR	CB	P	EXP	P	-	PAINT STRUCTURE INCL. MECH. DUCTS, SUPPORTS, CONDUIT ETC.
GROUND FLOOR - CHILDCARE									
301	VESTIBULE	POR	POR	CB	P	WRGB	P	2800	
302	CORRIDOR	POR	POR	CB	P	LAP	-	2600	
303	INFANT	SF-A	RR	CB	P	LAP	-	2800	
304	VESTIBULE	POR	POR	CB	P	WRGB	P	2800	
305	SLEEPING AREA	SF-A	RR	CB	P	LAP	-	2800	
306	WASHROOM	POR	POR	CB	P/CWT	GYP	P	2600	CWT FLOOR TO CEILING. REFER TO INTERIOR ELEVATION FOR LOCATION OF CWT.
307	STORAGE	POR	POR	CB	P	EXP	P	-	PAINT STRUCTURE INCL. MECH. DUCTS, SUPPORTS, CONDUIT ETC.
308	OFFICE	SF-R	RR	CB	P	LAP	-	2800	
309	CUSTODIAN/ MECHANICAL	S.CONC	RR	CB	P	EXP	P	-	PAINT STRUCTURE INCL. MECH. DUCTS, SUPPORTS, CONDUIT ETC.
310	LAUNDRY	SF-R	RR	CB	P	GYP	P	2600	
311	BARRIER FREE WASHROOM	POR	POR	CB	P/CWT	GYP	P	2600	CWT FLOOR TO CEILING. REFER TO INTERIOR ELEVATION FOR LOCATION OF CWT.
312	KITCHEN	POR	POR	CB	P/CWT	LAP	-	2800	CWT KITCHEN BACKSPLASH

ROOM FINISH SCHEDULE		FLOOR		WALL		CEILING			REMARKS
NO.	NAME	FIN.	BASE	MAT'L	FIN.	MAT'L	FIN.	HEIGHT(mm)	
313	STAFF ROOM	SF-R	RR	CB	P	LAP	-	2800	
314	PRE-SCHOOL	SF-A	RR	CB	P	LAP	-	2800	
315	WASHROOM	POR	POR	CB	P/CWT	GYP	P	2600	CWT FLOOR TO CEILING. REFER TO INTERIOR ELEVATION FOR LOCATION OF CWT.
316	VESTIBULE	POR	POR	CB	P	WRGB	P	2800	
317	PRE-SCHOOL	SF-A	RR	CB	P	LAP	-	2800	
318	WASHROOM	POR	POR	CB	P/CWT	GYP	P	2600	CWT FLOOR TO CEILING. REFER TO INTERIOR ELEVATION FOR LOCATION OF CWT.
319	TODDLER	SF-A	RR	CB	P	LAP	-	2800	
320	WASHROOM	POR	POR	CB	P/CWT	GYP	P	2600	CWT FLOOR TO CEILING. REFER TO INTERIOR ELEVATION FOR LOCATION OF CWT.
321	VESTIBULE	POR	POR	CB	P	WRGB	P	2800	
322	STORAGE	POR	POR	CB	P	EXP	P	-	PAINT STRUCTURE INCL. MECH. DUCTS, SUPPORTS, CONDUIT ETC.
323	TODDLER	SF-A	RR	CB	P	LAP	-	2800	
324	WASHROOM	POR	POR	CB	P/CWT	GYP	P	2600	CWT FLOOR TO CEILING. REFER TO INTERIOR ELEVATION FOR LOCATION OF CWT.
325	CHILDCARE STORAGE	S.CONC	RR	CB	P	EXP	P	-	PAINT STRUCTURE INCL. MECH. DUCTS, SUPPORTS, CONDUIT ETC.
SECOND FLOOR									
201	STAIR C	POR	POR	CB/GYP	P	EXP	P	-	PAINT STRUCTURE INCL. MECH. DUCTS, SUPPORTS, CONDUIT ETC.

ROOM FINISH SCHEDULE		FLOOR		WALL		CEILING			REMARKS
NO.	NAME	FIN.	BASE	MAT'L	FIN.	MAT'L	FIN.	HEIGHT(mm)	
202	CO-LAB	POR	POR	CB/GYP	P	EXP ASD	P	-	GLULAM BEAMS TO BE UNPAINTED. ACOUSTIC DECK TO BE PREFINISHED WHITE. PAINT CONDUITS, SUPPORTS ETC. WHITE SAME AS DECK. MECH DUCTS TO BE PAINTED COLOUR SELECTED BY ARCHITECT
203	CORRIDOR	POR	POR	CB	P	LAP/GYP	-	VARIES	REFER TO REFLECTED CEILING PLAN
204	SEMINAR 3	SF-R	RR	CB	P	LAP	-	2800	
205	ELEVATOR		REFER TO SPECIFICATIONS FOR FINISHES BY MANUFACTURER						
206	MECHANICAL ROOM	EWPM	RR	CB	P	EXP	P	-	PAINT STRUCTURE INCL. MECH. DUCTS, SUPPORTS, CONDUIT ETC.
207	CLASSROOM 3	SF-R	RR	CB	P	LAP	-	2800	
208	CLASSROOM 4	SF-R	RR	CB	P	LAP	-	2800	
209	STAIR A	POR	POR	CB	P	LAP	-	2600	
210	CLASSROOM 5	SF-R	RR	CB	P	LAP	-	2800	
211	CLASSROOM 6	SF-R	RR	CB	P	LAP	-	2600	
212	CLASSROOM 7	SF-R	RR	CB	P	LAP	-	2600	
213	BOYS WASHROOM	POR	POR	CB	P/CWT	GYP	P	2600	CWT FLOOR TO CEILING. REFER TO INTERIOR ELEVATION FOR LOCATION OF CWT.
214	GIRLS WASHROOM	POR	POR	CB	P/CWT	GYP	P	2600	CWT FLOOR TO CEILING. REFER TO INTERIOR ELEVATION FOR LOCATION OF CWT.
215	IT	SF-R	RR	CB	P	EXP	P	-	PAINT STRUCTURE INCL. MECH. DUCTS, SUPPORTS, CONDUIT ETC.

ROOM FINISH SCHEDULE		FLOOR		WALL		CEILING			REMARKS
NO.	NAME	FIN.	BASE	MAT'L	FIN.	MAT'L	FIN.	HEIGHT(mm)	
216	CUSTODIAN	SF-R	RR	CB	P	EXP	P	-	PAINT STRUCTURE INCL. MECH. DUCTS, SUPPORTS, CONDUIT ETC.
217	BARRIER FREE WASHROOM	POR	POR	CB	P/CWT	GYP	P	2600	CWT FLOOR TO CEILING. REFER TO INTERIOR ELEVATION FOR LOCATION OF CWT.
218	WASHROOM	POR	POR	CB	P/CWT	GYP	P	2600	CWT FLOOR TO CEILING. REFER TO INTERIOR ELEVATION FOR LOCATION OF CWT.
219	CORRIDOR	POR	POR	CB	P	LAP/GYP	-	VARIES	REFER TO REFLECTED CEILING PLAN
220	CLASSROOM 8	SF-R	RR	CB	P	LAP	-	2800	
221	CLASSROOM 9	SF-R	RR	CB	P	LAP	-	2800	
222	SEMINAR 5	SF-R	RR	CB	P	LAP	-	2800	
223	CLASSROOM 10	SF-R	RR	CB	P	LAP	-	2800	
224	CLASSROOM 11	SF-R	RR	CB	P	LAP	-	2800	
225	CLASSROOM 12	SF-R	RR	CB	P	LAP	-	2800	
226	CLASSROOM 13	SF-R	RR	CB	P	LAP	-	2800	
227	STAIR B	POR	POR	CB	P	LAP	-	2600	
228	ACAD STORAGE	SF-R	RR	CB	P	LAP	-	2800	
229	WORKROOM	SF-R	RR	CB	P	LAP	-	2800	
230	CLASSROOM 14	SF-R	RR	CB	P	LAP	-	2800	

ROOM FINISH SCHEDULE		FLOOR		WALL		CEILING			REMARKS
NO.	NAME	FIN.	BASE	MAT'L	FIN.	MAT'L	FIN.	HEIGHT(mm)	
231	CLASSROOM 15	SF-R	RR	CB	P	LAP	-	2800	
232	CLASSROOM 16	SF-R	RR	CB	P	LAP	-	2800	
233	CLASSROOM 17	SF-R	RR	CB	P	LAP	-	2800	
234	SEMINAR 6	SF-R	RR	CB	P	LAP	-	2800	
235	CLASSROOM 18	SF-R	RR	CB	P	LAP	-	2800	
236	CLASSROOM 19	SF-R	RR	CB	P	LAP	-	2800	
237	CLASSROOM 20	SF-R	RR	CB	P	LAP	-	2800	
238	SCIENCE	SF-R	RR	CB	P	LAP	-	2800	
239	ART	SF-R	RR	CB	P/SAB	EXP/ ACP	P	-	PAINT STRUCTURE INCL. MECH. DUCTS, SUPPORTS, CONDUIT ETC.
240	STORAGE	SF-R	RR	CB	P	LAP	-	2600	
241	STORAGE	SF-R	RR	CB	P	LAP	-	2600	
242	MUSIC	SF-R	RR	CB	P/SAB	EXP/ ACP	P	-	PAINT STRUCTURE INCL. MECH. DUCTS, SUPPORTS, CONDUIT ETC. REFER TO INT. ELEVATIONS.
243	MECH. MEZZANINE	S.CONC	RR	CB	P	EXP	P	-	PAINT STRUCTURE INCL. MECH. DUCTS, SUPPORTS, CONDUIT ETC.
244	STOR.	SF-R	RR	CB	P	EXP	P	-	PAINT STRUCTURE INCL. MECH. DUCTS, SUPPORTS, CONDUIT ETC.
GENERAL NOTES:									
1	REFER TO SPECIFICATION SECTION 09 91 30 FOR ABBREVIATIONS LEGEND.								

ROOM FINISH SCHEDULE		FLOOR		WALL		CEILING			REMARKS
NO.	NAME	FIN.	BASE	MAT'L	FIN.	MAT'L	FIN.	HEIGHT(mm)	
2	This schedule MUST be read in conjunction with a complete set of drawings to ascertain all details and finished surfaces that may not be listed on the schedule.								
3	Where ceramic wall tile is identified, G.C. to coordinate tile installation behind all fixtures (do not tile around fixtures).								
4	Where a gypsum board bulkhead is identified above millwork, it shall have a painted finish. Refer to Interior Elevations for where acoustic panels or other mateirals wrap onto bulkhead								
5	Refer to interior elevations, plans sections and reflected ceiling plans to coordinate finish notes and extents of materials.								

PART 1 - GENERAL

1.1 General Notes

1. Find the **Room Finish Schedule** on the following pages
2. **This schedule MUST be read in conjunction with a complete set of drawings** to ascertain all details and finished surfaces that may not be listed on the schedule.
3. Refer to interior elevations, plans sections and reflected ceiling plans to coordinate finish notes and extents of materials.
4. Refer to various specifications sections for different types of materials including, but not limited to:
   - .1 flooring materials
   - .2 ceiling materials
   - .3 wall treatment
5. Abbreviations Legend:

Code	Reference
ACP	Acoustic Ceiling Panel (CAPZ)
ASD	Acoustic Deck
CB	Concrete Block
CLD	Ceiling Cloud Acoustic Panels
CPT	Carpet
CWT	Ceramic Wall Tile
EP	Paint - Epoxy
EWPM	Exposed Waterproof Membrane (refer to Section 09 97 24)
FAB	Fabric Acoustic Panels
GB	Gypsum Board
GWT	Glass Wall Tile
LAP	Lay-in Acoustic Panel
MV	Masonry Veneer
P.GF	Paint - Gloss Finish
POR	Porcelain Tile
P	Paint
PWP	Perforated Wood Panels
RR	Resilient Rubber
RSTR	Rubber Stair Tread & Riser
SAB	Solid Acoustic Sound Blocks
S.CONC	Sealed Concrete (refer to Section 03 35 05.)
SF-A	Sheet Flooring
SF-R	Sheet Flooring
SF-SP	Sheet Flooring – Sport (Gym)
TEC	Tectum Panels
WG or WGA	Wood Acoustic Grilles

END OF SECTION

1 General

1. SUMMARY

.1 Section Includes:
  .1 Compliance with requirements of the sections of Division 1 of the specifications.
  .2 Requirements for providing the concrete floor sealer parts of the Work.

2. SUBMITTALS

.1 Product Data:
  .1 Submit manufacturer's technical data, installation instructions, maintenance instructions and general recommendations for concrete floor sealer.

.2 Samples:
  .1 Provide samples as specified in section 01 33 00 Samples, supplemented as follows:
    .1 Submit 300 mm x 300 mm square sample of concrete floor sealer applied to a smooth trowel finish concrete paver.
    .2 Submit each type of sample in triplicate.
    .3 Modify and resubmit samples as many times as may be necessary to obtain Consultant’s approval.

.3 Closeout Documents:
  .1 Provide manuals that contain the floor sealer manufacturer's maintenance and repair manual. The maintenance and repair manuals shall give specific warning of maintenance practices, Products and materials which may cause damage and disfigurement.

3. QUALITY ASSURANCE

.1 Single Source Responsibility:
  .1 Obtain concrete floor sealer Products from the same manufacturer with not less than ten (10) years of successful experience in manufacturing and installing principal materials described in this section. Contractor must have completed at least five projects of similar size and complexity. Provide secondary materials only of type and from source recommended by manufacturer of primary materials.

.2 Pre-installation Meeting:
  .1 Hold a pre-installation meeting at the Place of the Work.

.3 Mock-up:
  .1 At site, under manufacturer's supervision, apply for approval 9 m2 of each type of complete floor finish in area designated, to match submitted samples. When approved, site applied sample to be standard for appearance, texture, workmanship, etc. All Work to conform to this sample.

4. DELIVERY, STORAGE AND HANDLING

.1 Deliver Products to the Place of the Work. Check material for completeness and shipping damage prior to job start.

.2 All materials must be factory pre-weighed and pre-packaged in single, easy to manage batches to eliminate on site mixing errors. No on site weighing or volumetric measurements allowed.

.3 Store Products in a dry, enclosed area protected from exposure to moisture. Temperature of storage area shall be maintained between 16° and 32°C.

5. PROJECT CONDITIONS

.1 Environmental Requirements:
- .1 Concrete substrate must be properly cured for a minimum of 30 days.

.2 Temperature:
- .1 Maintain ambient temperature of not less than 18 deg.C/65 deg.F and a floor temperature of not less than 16 deg.C/60 deg.F from 7 days before installation to at least 48 hours after completion of work and maintain relative humidity not higher than 40% during same period.

.3 Moisture:
- .1 Ensure substrate is within moisture limits prescribed by concrete floor sealer manufacturer.

.4 Protection:
- .1 Areas to accept concrete floor sealer shall be free of other trades during, and for a period of 24 hours, after floor installation.

.5 Manufacturer’s Representative:
- .1 Manufacturer's representative must be on job site at start of installation.

6. WASTE MANAGEMENT AND DISPOSAL

.1 Collect and separate packaging material for recycling in accordance with the Waste Management Plan.

.2 Remove from the Place of the Work and dispose of packaging materials at appropriate recycling facilities.

.3 Dispose of unused finish and adhesive materials at official hazardous material collections site.

7. WARRANTY

.1 Furnish a single, written warranty covering both material and workmanship for a period of three (3) full years from date of Substantial Performance of the Work. The Warranty shall cover defects such as cracking, delamination under impact and under heavy loaded carts and under thermal shock, and excessive wear.

2 Products

1. MATERIALS

.1 Manufacturers:
  .1 The specifications are based on Products manufactured by Sika Canada Inc. Products by Duochem Inc, division of Corrosion Services, CPD Construction Products, Niagara Protective Coatings, Selby/Ucrete,. Stonhard Ltd. Euclid or other approved manufacture may be approved on condition of being able to furnish evidence of equivalency or better to the specified Products.

.2 Concrete Floor Sealer System (EWPM)
  .1 General:
    .1 Two-component, clear, water based mat epoxy coating, Sika MRW roller applied two coat system on a sealed/primed substrate.
  .2 Characteristics
    .1 Seamless and very easy to clean.
    .2 Abrasion and chemical resistant.
    .3 No odour typical of solvent based coatings
  .3 Minimum Technical requirements
    .1 Solids content: 100% by weight, 100% by volume.
    .2 Pot life90 mins.
    .3 Application method: Brush, or roller.
    .4 Number of coats: Two.
    .5 Dry film thickness per coat: as per manufacturer's instructions
    .6 Cleaning solvent: Warm water.
    .7 Cure time: Touch dry: 4-5 hours.
      .1 Hard dry: 16-18 hours.
      .2 Complete cure: 7 days.
    .8 Recoat time: 16 hours.
  .4 Minimum Physical properties
    .1 Abrasion resistance: 175 mg loss per ASTM D 4060 CS-17 wheels 1000 revolutions 1000 gr/wheel.
    .2 Tensile strength 2.1 MPa per ASTM D 2370 (2.8 mils D.F.T.)
  .5 Primer: as recommended by manufacturer.

3 Execution

1. WORKMANSHIP

.1 General
  .1 Handle, mix and apply Products as per the Product manufacturer's printed surface preparation and application specifications, and as specified in this specification section 09 97 24.
  .2 Application tools and equipment shall be as per the Product manufacturer's printed requirements.

2. **PREPARATION**

.1 Prepare concrete by sanding smooth and for removal of bond inhibiting substances.
.2 Apply as per manufacturer's instructions.

3. **APPLICATION**

.1 Apply concrete sealer as indicated.
.2 Rolling direction of each coat shall be the same.

4. **FIELD QUALITY CONTROL**

.1 The Owner reserves the right to invoke the following material testing procedure at any time, and any number of times during period of flooring application.

.2 The Owner may engage service of an independent testing laboratory to sample materials being used on the jobsite. Samples of material will be taken, identified and sealed, and certified in presence of Contractor.

.3 Testing laboratory will perform tests for any of characteristics specified, using applicable testing procedures referenced herein, or if none referenced, in manufacturer's product data.

.4 If test results show materials being used do not comply with specified requirements, the Contractor may be directed by Owner to stop work; remove non-complying materials; pay for testing; reapply flooring materials to properly prepared surfaces which had previously been coated with unacceptable materials.

5. **CURING, PROTECTION AND CLEANING**

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

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

.3 Cleaning: Remove temporary covering and clean flooring just prior to final inspection. Use cleaning materials and procedures recommended by the concrete floor sealer manufacturer.

END OF SECTION

Part 1 General

1.1 RELATED SECTIONS

.1 Section 01 33 00 – Submittal Procedures.

1.2 SUBMITTALS

.1 Product Data:

.1 Submit manufacturer's printed product literature, specifications and data sheet in accordance with Section 01 33 00 - Submittal Procedures.

.2 Shop Drawings:

.1 Submit shop drawings in accordance with Section 01 33 00 - Submittal Procedures.

.3 Samples:

.1 Submit samples in accordance with Section 01 33 00 - Submittal Procedures.

.4 Manufacturer's Instructions:

.1 Submit manufacturer's installation instructions.

1.3 WASTE MANAGEMENT AND DISPOSAL

.1 Remove from site packaging materials at appropriate recycling facilities.

.2 Dispose of recyclable packaging material in appropriate on-site bin for recycling.

Part 2 Products

2.1 MATERIALS

.1 Tack Boards (TB) - As manufactured by Architectural School Products/ASI, Mississauga, or approved equivalent; natural coloured cork tackboard:

.1 12.7mm (1/2”) factory prelaminated consisting of 6mm (1/4”) thick a.s.p. natural cork laminated to 6mm (1/4”) particle board or masonite substrate under mechanical pressure in maximum panel sizes of 1219mm x 2438mm (4’0” x 8’0”). Bonding of materials by a waterproof adhesive that will not delaminate or rupture at the contact surfaces.

.2 All tackboards shall meet the minimum requirements of the applicable building code and/or Ontario Fire Marshall’s office.

.3 Acceptable alternates: Global School Products Inc. or other approved equivalents.

.4 Shop finish rear faces of tackboard units being installed in horizontal sliding trim to a matte black finish.

.5 Refer to Construction Drawings for locations & sizes required.

□

.2 Sliding Tack Boards (STB) - As manufactured by Architectural School Products/ASI, Mississauga or approved equivalent; natural coloured cork tackboard:

.1 Sliding model ASI 9800 SL, with one fixed and two sliding panels as required to stack between windows and slide across each windows individually.

.3 Linoleum Bulletin Boards (BB) – Coloured linoleum (linseed oil) bulletin boards as manufactured by FORBO and distributed by Architectural School Products, Mississauga; colour from standard selection:

.1 12.7mm (1/2") thick Forbo panels cut to sizes as indicated on drawings.

.2 All bulletin boards shall meet the minimum requirements of the applicable building code and/or Ontario Fire Marshall's office.

.3 Refer to Drawings for locations & sizes required.

.4 Include on inside of all display cases and in as tackboards in some locations noted on drawings.

.4 White Boards (WB) - "Vit-Rite: Rite on, Wipe off" model as manufactured by Architectural School Products, Mississauga or approved equivalent.

.1 Manufactured by architectural school products Ltd., Mississauga, Ontario, or approved equivalent, consisting of a sandwich type construction composed of face panel, core and balancing rear sheet, in maximum panel sizes of 1219mm x 2438mm (4'0" x8'0")

.2 Face Panel – 22 gauge high quality enamelling steel base with a porcelain enamel writing surface used to a ground coat of not less than 0.076mm (.003") nor more than 0.127mm (.005") after firing at temperatures between 700°C (1300°F) and 800°C (1500°F) in accordance with the Porcelain Enamel Institute Standards PEI S104 as regards to durability, smoothness of texture, colour continuity and a gloss factor of 6 – 8 as measured by 45° glossometer.

.3 Core – 11.1mm (7/16") impregnated sound absorbing fibreboard laminated under heat and pressure to face panel and back sheet utilizing adhesives that ensure rupturing of the component materials before failure of joint contact surfaces.

.4 Back up balancing sheet – 28 gauge zinc coated stretcher leveled steel in one unjointed section. Overall thickness of Whiteboard lamination shall be 12.7mm (1/2").

.5 Colour: White

.6 Acceptable alternates: Global School Products Inc. or other approved equivalents.

.7 Refer to Construction Drawings for locations & sizes required.

.8 Manufacturer's Warranty: warrant White Boards for a period of 10 years against defects due to normal usage and wear.

.5 WhiteBoards, Recessed (WB Recessed) - "Vitrite" model as Manufactured by Architectural School Products, Mississauga, or approved equivalent;

.2 Recessed wall mounted whiteboards; porcelain enameled 22 ga. steel on 11 mm fibreboard core on 28 ga. zinc coated steel back up sheet.

.3 Colour: White. Flush trim and flush marker tray No. 461.

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.4 Provide all hardware and fasteners suitable for secure recessed mounting.

.5 Size as per drawings.

.6 Acceptable alternates: Global School Products Inc. or other approved equivalents.

.7 Quantity: 2; Location: Gymnasium

.6 White Board, Tack Board and Bulletin Board Fixed Trim: ASP Series 200 to match details and profiles shown on architectural drawings. Aluminum to be 6063-T5 alloy with 0.051 mm thick clear anodized satin finish, free from extruding draw marks and surface scratches; components as follows:

.8 Perimeter Trim: extruded aluminum trim for all tackboards and also vertical jambs of chalkboards; e.g. ASP No. 205.

.9 Divider Bar: extruded aluminum trim to adjacent chalkboard/tackboard panels and adjacent tackboard panels of elevations greater then 2,440 mm; e.g. ASP No. 207.

.10 Map Rail: extruded aluminum trim complete with integral tan cork insert, end stops and two combination roller map hooks for ever 1.83 linear metres of map rail; e.g. ASP No. 206.

.11 Marker Tray: extruded aluminum triangular box section for chalkboard elevation only complete with contour fitting end castings; 102 mm projection from finished wall; e.g. ASP No. 212.

.12 Marker Tray Over Millwork: extruded aluminum trims section for elevations mounted directly on or above millwork; 70 mm projection from finished wall; e.g. ASP No. 264.

.13 Display rail above each chalkboard, tackboard and whiteboard: one of the following products:

.1 "Kwikgrip" Display Rail by Architectural School Products Ltd. (Model 200).

.2 "Grip-A-Strip" by Global.

.14 Chalk rail below each chalkboard and markerboard: A.S.P. #212 (no cabinets below) and #264 (cabinets below).

.15 Refer to Construction Drawings for locations & sizes required.

.7 Dry Erase Magnetic Wallcovering**:**

.16 WALLS IQ Dry Erase Magnetic Wallcovering WIQ006 by Prime Walls (primewalls.ca). 1.22m wide x length required based on drawings.

.17 High-gloss erase wall with magnetic backing.

.18 Install per manufacturer's instructions.

.19 Approved alternate meeting the product intent.

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.

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3.2 INSTALLATION

.1 Install where indicated on drawings and as per manufacturer's instructions.

3.3 DEMONSTRATION AND TRAINING

.1 Provide demonstration of operation to the Owner and his representatives.

.2 Provide training for operation, maintenance and repairs.

3.4 CLEANING

.1 Perform cleaning after installation to remove construction and accumulated environmental dirt.

.2 Clean surfaces after installation using manufacturer's recommended cleaning procedures.

.3 Clean aluminum with damp rag and approved non-abrasive cleaner.

.4 Upon completion of installation, remove surplus materials, rubbish, tools and equipment barriers.

END OF SECTION

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Part 1 General

1.1 RELATED SECTIONS

.1 Section 01 33 00 – Submittal Procedures.

1.2 SUBMITTALS

.1 Product Data:

.1 Submit manufacturer's printed product literature, specifications and data sheet in accordance with Section 01 33 00 - Submittal Procedures.

.2 Shop Drawings:

.1 Submit shop drawings in accordance with Section 01 33 00 - Submittal Procedures.

.3 Samples:

.1 Submit samples in accordance with Section 01 33 00 - Submittal Procedures.

.4 Manufacturer's Instructions:

.1 Submit manufacturer's installation instructions.

1.3 WASTE MANAGEMENT AND DISPOSAL

.1 Remove from site packaging materials at appropriate recycling facilities.

.2 Dispose of recyclable packaging material in appropriate on-site bin for recycling.

Part 2 Products

2.1 MATERIALS

.1 Safety Release Coat Hook (BH):

.1 Refer to Sections 06 40 00 where specified for Childcare and Kindergarten Cubbies.

.2 This section to supply safety hooks for all other locations, such as barrier free washroom locations.

.3 High strength polycarbonate coat hook with safety release weight under downward pressure to not exceed 12 kg (26 lbs.)

.4 Supply all suitable mounting hardware for a vandal proof, secure installation using stainless steel sleeve bolts on partition doors or panels. Do not supply standard Robertson or Phillips head screws.

.5 Colours:

.1 Allow for two (3) colours from Manufacturers standard line

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.6 Acceptable Materials: “HenkelHook” as manufactured/distributed by Henkel Diversified Inc, London ON, tel (519) 641-5872.

.7 Locations:

.1 Coat hooks to be mounted in ALL barrier free washrooms and shall be safety release style and mounted on the side wall

.2 Childcare and Kindergarten Cubbie Areas to be provided by Section 06 40 00.

.8 Samples: submit test data and samples for review as specified in Section 013330 – Submittal Procedures.

.2 Flagpole - Stepped aluminum flagpole: Model No. TS 30 as manufactured by Daf Indal Ltd.

.1 Cone tapered models meeting or exceeding these criteria will ne accepted as alternate products.

.2 minimum 9150 mm high (30'), complete with tilt anchor base, base cover, and concrete anchors.

.3 Shaft to be fitted with an internal #12 braided nylon halyard revolving truck system, stepped shaft aluminum alloy 6063-T6 (butt 127 o.d., butt wall 4.8 mm).

.4 Ball -152 mm in diameter, color ball: clear anodized.

.5 Finish of pole and accessories: Clear anodized.

.6 Base cover spun aluminum alloy 6061, 254 mm in diameter, wall thickness of 2.3 mm.

.7 Acceptable Alternates: John Ewing or All-Canadian Flagpole Co.

.8 Quantity: 1; Location: as shown on Drawing SP.1 and AD 212.

.3 Electric Projector Screen (Gym):

.1 Projection Screen: 110V power supply; dual motors, one motor operating the closure door and the second motor operating the projection screen; with remote control and switched operation; sizes and surfaces as indicated below; Cosmopolitan Electrol by Da-Lite Screens Inc.

.2 Projector Screen Components:

.1 Gym Screen: Wall Mounted; 2670mm x 3560mm size viewing surface, heavy duty matte white; 450mm block top skirt, black masking borders; 10mm OD tubular steel bottom slat, with baked enamel finish and plastic end caps.

.2 Enclosure: flat back design, rectangular steel case, baked enamel finish; for wall mount application; with fully automatic ceiling closure doors and in-the-roller motor mounting system; one required for each screen.

.3 Remote Control System: dual motor low voltage control system with three-button wireless radio frequency remote receiver and transmitter; separate UP, DOWN, and STOP commands, complete with control module, three-button keyed wall switch, box, cover plate and three button control radio frequency transmitter with receiver; one required for each screen.

.3 Location: 1 required in Gym, mounted on wall.

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.4 Shop Drawings: Submit shop drawings in accordance with Section 01300 Submittals.

.4 Modular Welded Wire Partition System:

.1 Welded wire mesh partition and swing doors as manufactured by Spinnaker Industries Inc.

.2 Provide a complete assembly, complete with hinges and locking hasps.

.3 Location: Sprinkler Room 119

.4 Size: Approx. 1800mm high x width required to enclose area per drawings.

.5 Change Table with integrated stair:

.1 Change table with sink, manufactured by Tot Mate.

.2 Model TM8534A, Maple finish, right handed (no sink).

.3 Include pull-out toddler walk-up.

.4 Location & Quantity: Refer to drawings (Childcare areas).

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 INSTALLATION

.1 Install where indicated on drawings and as per manufacturer’s instructions.

3.3 DEMONSTRATION AND TRAINING

.1 Provide demonstration of operation to the Owner and his representatives.

.2 Provide training for operation, maintenance and repairs.

3.4 CLEANING

.1 Perform cleaning after installation to remove construction and accumulated environmental dirt.

.2 Clean surfaces after installation using manufacturer's recommended cleaning procedures.

.3 Clean aluminum with damp rag and approved non-abrasive cleaner.

.4 Upon completion of installation, remove surplus materials, rubbish, tools and equipment barriers.

END OF SECTION

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Part 1 General

1.1 RELATED WORK

.1 Section 01 33 00 - Submittal Procedures.

1.2 WORK INCLUDED

.1 Supply and install exterior signage as specified and listed. All signage may not be shown on the drawings.

.2 Supervision, inspection and checking of signage as installed on site.

1.3 REFERENCES

.1 All fire route signage to be fabricated in strict accordance with the signage standard of the Municipality where the site is located. All other exterior signage such as stop signs, one-way signs, do not enter signs, etc., shall be to M.O.T. standard.

.2 Aluminum Association, Inc. (AA)

.1 Designation System for Aluminum Finishes -[1997].

.3 American Society for Testing and Materials (ASTM)

.1 ASTM A653/A653M-[01a], Standard Specification for Steel Sheet, Zinc-Coated, (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process.

.2 ASTM B32-[00], Standard Specification for Solder Metal.

.3 ASTM B456-[95], Standard Specification for Electrodeposited Coatings of Copper Plus Nickel Plus Chromium and Nickel Plus Chromium.

.4 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.

.4 CGSB 41-GP-6M-[1983], Sheets, Thermosetting Polyester Plastics, Glass Fibre Reinforced. Reaffirmation of September 1976.

.5 Canadian Standards Association (CSA)

.1 CAN/CSA-G164-[M92(R1998)], Hot Dip Galvanizing of Irregularly Shaped Articles.

.2 CSAW47.2-[M1987(R1998)], Certification of Companies for Fusion Welding of Aluminum.

.3 CSA W59-[M1989(R2001)], Welded Steel Construction (Metal Arc Welding) (Imperial Version).

.4 CSA W59.2-[M1991(R1998)], Welded Aluminum Construction.

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.6 Canadian Sheet Steel Building Institute (CSSBI)

.1 Sheet Steel Facts # 6, Metallic Coated Sheet Steel for Structural Building Products-[July 1995].

.7 The Master Painters Institute (MPI)

.1 Architectural Painting Specification Manual - [March 1998].

1.4 SHOP DRAWINGS

.1 Submit shop drawings in accordance with Section 01 33 00 - Submittal Procedures.

1.5 SAMPLES

.1 Submit samples in accordance with Section 01 33 00 - Submittal Procedures.

1.6 QUALITY ASSURANCE

.1 Welding Certification in accordance with CSA W47.2.

1.7 SIGNAGE LIST

.1 A full Signage list is listed below and shown on site plan drawing.

1.8 GUARANTEE

.1 Submit a written Guarantee to the Board, that all work of this Tender shall be free from defects in workmanship and materials for a minimum period of one (1) year from date of approved completion.

.2 All defects (excluding vandalism) in materials and workmanship that become apparent during the Guarantee period shall be made good or material replaced at no cost to the Board.

1.9 WASTE MANAGEMENT AND DISPOSAL

.1 Remove from site and dispose of all packaging materials at appropriate recycling facilities.

.2 Collect and separate for disposal packaging material for recycling.

.3 Place materials defined as hazardous or toxic in designated containers.

.4 Divert unused materials from landfill to metal recycling facility as approved by Consultant.

.5 Unused paint or coating material must be disposed of at an official hazardous material collections site as approved by Consultant.

.6 Fold up metal banding, flatten and place in designated area for recycling.

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.7 Do not dispose of unused paint material into sewer system, into streams, lakes, onto ground or in any other location where it will pose health or environmental hazard.

Part 2 Products

2.1 MATERIALS

.1 Aluminum extrusions: to designation AA 6063-T5 and AA 6006-T5.

.2 Sheet aluminum: anodizing quality.

.3 Prefinished sheet steel: conforming to CSSBI - Sheet Steel Facts #6: for normal environment: in colours selected from manufacturer's standard range.

.4 Galvanized steel sheet to ASTM A653/A653M: Commercial Quality.

.5 Welding materials: to CSA W59.

.6 Solder: to ASTM B32, Type [Sn50].

.7 Self-stick foam tape: 2.4 mm thick, [352.4] Kg/m^3 density polyurethane open-cell foam tape for sign purposes, with synthetic self-stick adhesive on both sides. Width: to suit sign sizes.

.8 Acrylic top-coat: clear, non-yellowing, exterior grade, satin finish, acrylic polyester resin protective coating, compatible with metal surface of type recommended by sheet manufacturer.

.9 Bituminous paint: to MPI [EXT 5.4D].

.10 Mounting Hardware:

.1 Furnish all signage with the necessary screws, bolts, and other fasteners of suitable size and type, to anchor signage into position for long life under hard use.

.2 Exterior Fire route and School signs shall be permanently mounted on a strong flanged hot dipped rolled high tensile galvanized steel U-Channel posts. Theses posts are to have 10mm (3/8”) dia. Holes spaced 25mm (1”) on centre for easy sign mounting. Signs to be mounted to flanged side of post. All exterior signs are to come completed with galvanized steel mounting hardware, necessary to properly mount sign for exterior use. Fire route sign FR-6 when required is to be installed at a 45 degree angle in relation to the edge of the traveled portion of the designated fire route facing approaching traffic. Fire route signs FR-7 and FR-8 when required are to be installed at a 90 degree angle in relation to the edge of the traveled portion of the designated fire route, in such manner as to allow both sign faces to be visible to traffic, or as listed otherwise. Fire route sign FR-9 when required is to be installed at a 90-degree angle to the edge of the traveled portion of the designated fire route. Not withstanding what is stated here in 2.1.2, all signage must comply with the latest by-laws in the Municipalities applicable to the work.

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.11 U-Posts:

.1 Hot dipped rolled light temple galvanized steel
.2 Type: Flanged, 10 mm 0 holes @ 25 mm.o.c.
.3 Height: 3658 mm overall

.12 Free Standing Posts:

.1 Material: 25 mm x 25 mm galvanized steel hollow sections, primed + 2 coats exterior grade enamel
.2 Base: 100lb weight concrete base.
.3 Modified height: bottom of base to top of port: 15 25 mm

.13 Exterior Traffic Signs:

.1 Material: Aluminum
.2 Letters: Refer to style detail
.3 Mounting height: 2.0 to bottom of sign

2.2 SIGNAGE LIST

.1 All styles, quantities and location to be confirmed prior to ordering.

.2 "Stop" Signs:

.1 600 m x 600 m, red background, white lettering, white border.
.2 Quantity: refer to drawings and PMP-101, PMP-102 & PMP-103 in Binder C.

.3 "Do Not Enter" Signs:

.1 600mm x 750mm, background, red circle, white bar, black border and lettering
.2 Quantity: refer to drawings and Binder C.

.4 "One Way" Signs (arrow left):

.1 300 mm x 900 mm, black background, white arrow and border, black listing
.2 Quantity: refer to drawings and PMP-101, PMP-102 & PMP-103 in Binder C.

.5 "Fire Department Connection" Signs:

.1 300mm x 450 mm, red background, white letters and borders
.2 1 required
.3 Mount on building at Fire Department Connection

.6 "Fire Route" Signs:

.1 As per Municipal standards
.2 Allow for supply and installation of 10 signs
.3 6 signs mounted on U-posts driven through sod and 4 mounted to building.

.7 "Disabled Parking Permit" Signs:

.1 300 mm x 600mm white background, black border and letters, blue handicapped symbols and border, red circle and diagonal bar

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.2 Quantity: refer to drawings and PMP-101, PMP-102 & PMP-103 in Binder C.

.8 "School Bus Loading Zone" Signs:
- .1 450mm x 300mm, white background black arrow & lettering.
- .2 Quantity: refer to drawings and PMP-101, PMP-102 & PMP-103 in Binder C.

.9 "Speed Limit Info" Signs:
- .1 Quantity: refer to drawings and PMP-101, PMP-102 & PMP-103 in Binder C.

.10 "School Zone Flasher":
- .1 Quantity: refer to drawings and PMP-101, PMP-102 & PMP-103 in Binder C.

.11 "Flasher 40kmh Zone Ends" Signs:
- .1 Quantity: refer to drawings and PMP-101, PMP-102 & PMP-103 in Binder C.

Part 3 Execution

3.1 INSTALLATION

.1 Erect and secure signs plumb and level at elevations as indicated.

.2 Comply with sign manufacturer's installation instructions and approved shop drawings.

.3 Mechanical attachment:

- .1 To concrete or solid masonry use lag screws and expansion bolts or screws and fibre plugs, as appropriate for stresses involved.
- .2 To hollow masonry use toggle bolts or equivalent.
- .3 To steel use bolts with nut and lock washers, self-tapping screws.
  - .1 Do [steel welding to CSA W59] [and] [aluminum welding to CSA W59.2]. Finish exposed welds flush and smooth.
- .4 To wood use screws.
- .5 Secure into framing members behind stud walls or above ceilings.
- .6 Mechanical fasteners on exterior to be non-staining, non-ferrous type.
- .7 Fabricate special fasteners as required for installation conditions.
- .8 Mechanical fasteners and methods of attachment subject to Engineer's approval. Obtain Engineer's approval before fixing to structural steel.

.4 Adhesive attachment:

- .1 Use self-stick adhesive foam tape to manufacturer's instructions to adequately fix sign and prevent "rocking". Keep tape maximum 1.6mm from edges.

3.2 CLEANING

.1 Leave signs clean. Remove debris from interior of sign boxes.

.2 Touch up any damaged finishes.

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END OF SECTION

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Part 1 General

1.1 RELATED SECTIONS

.1 Section 01 33 00 - Submittal Procedures.

.2 Section 05 50 00 - Metal Fabrications: Suspended channel support for ceiling hung partitions.

.3 Section 10 28 10 - Toilet And Bath Accessories.

.4 Section 03 41 00 – Plant- Precast Structural Concrete.

1.2 REFERENCES

.1 American Society for Testing and Materials (ASTM)

.1 ASTM A167-[99], Standard Specification for Stainless and Heat-Resisting Chromium-Nickel Steel Plate, Sheet, and Strip.

.2 Canadian General Standards Board (CGSB)

.1 CAN/CGSB-71.20-[M88], Adhesive, Contact, Brushable.

.3 Canadian Standards Association (CSA)

.1 CAN/CSA-B651-[95(R2001)], Barrier-Free Design.

1.3 SHOP DRAWINGS

.1 Submit shop drawings in accordance with Section 01 33 00 - Submittal Procedures.

.2 Indicate fabrication details, plans, elevations, hardware, and installation details.

1.4 SAMPLES

.1 Submit samples of finish hardware and phenolic plastic in selected colour and finish in accordance with Section 01 33 00 - Submittal Procedures, for approval of Consultant.

1.5 STORAGE AND PROTECTION

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

1.6 WASTE MANAGEMENT AND DISPOSAL

.1 Remove from site and dispose of all packaging materials at appropriate recycling facilities.

.2 Collect and separate for disposal [paper] [plastic] [polystyrene] [corrugated cardboard] packaging material [in appropriate on-site bins] for recycling.

.3 Place materials defined as hazardous or toxic in designated containers.

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.4 Divert unused metal materials from landfill to metal recycling facility as approved by Consultant.

.5 Unused sealant and adhesive material must be disposed of at an official hazardous material collections site as approved by Consultant.

.6 Fold up metal banding, flatten and place in designated area for recycling.

.7 Do not dispose of unused sealant and adhesive material into sewer system, into streams, lakes, onto ground or in any other location where it will pose health or environmental hazard.

Part 2 Products

2.1 MATERIALS

.1 Laminated plastic toilet partitions.

.2 Plastic Laminate Faced Partitions: high pressure laminate matte finish surface on high density particle board, anchored to floor and head braced. Three (3) colours will be chosen by the Consultant from laminate manufacturer's standard selection. Locations: Washrooms as shown on drawings.

.3 Laminated plastic adhesive: to CAN/CGSB-71.20.

.4 Sealer: water resistant sealer or glue as recommended by laminate manufacturer.

2.2 COMPONENTS

.1 Safety Release Coat hook:

.1 High strength polycarbonate coat hook with safety release weight under downward pressure to not exceed 12 kg (26 lbs.)

.2 Supply all suitable mounting hardware for a vandal proof, secure installation using stainless steel sleeve bolts on partition doors or panels. Do not supply standard Robertson or Phillips head screws.

.3 Colours: 2 premium colours from manufacturer’s complete range.

.4 Acceptable Materials: “HenkelHook” as manufactured/distributed by Henkel Diversified Inc, London ON, tel (519) 641-5872.

.5 Locations: in all barrier free washroom locations as noted in article 2.4 below.

.6 Samples: submit test data and samples for review as specified in Section 013330 – Submittal Procedures.

.2 Door pull: Barrier-free type suited for outswinging doors stainless steel.

2.3 MATERIAL DESCRIPTION

.1 Laminate Faced Partitions: floor mounted and head rail braced. Fabricated with:

.1 1.6 mm high pressure laminate facings and edging on 45 lb. density resin impregnated high density fibreboard, and complete with stainless steel hardware and fittings.

.2 Doors, pilasters and partitions to be min, 25 mm thick.

.3 headrails to be 24 x 41 anodized aluminum anti-grip type with sloped top configured and installed to prevent swinging or concealment of small items.

.4 pilasters to have 3.2 mm core and integral leveling device concealed by 100 mm high stainless steel shoe.

.5 All hardware to be heavy-gage type 304 stainless steel with self-closing continuous hinge full height of door and reinforced sliding latch keeper.

.6 Pulls on outside of handicapped doors.

.7 All doors to have rubber tipped bumper and slide bar latch, combination door stop and keeper, all attached with stainless steel sleeve bolts with theft proof heads.

.8 Provide stops on top and bottom of all doors.

.9 No coat hooks to be provided.

.10 All partitions to be anchored to wall by means of stainless steel channel bracket for full height of partition.

.11 Acceptable Materials: as manufactured by Bobrick Washroom Equipment of Canada Ltd., Model 1042 series.

.12 Acceptable alternates: Series 130GP by Watrous/ASI Group Canada; Series 3 style 2 by Twin-Cee, or meeting these exact specifications as manufactured by Ampco Products Ltd. or Shanahan's Ltd. and distributed by W.G. Wood Sales Ltd., "Mills" by Bradley and Supplied by Wentworth Associates Ltd. 905 627-7070, Metpar Corp., Hiny Hinders by Scranton Products, Hadrian Manufacturing Inc., Global Storage Systems, or others meeting or exceeding these exact specifications if reviewed and approved by the Consultant during the tender period.

2.4 FABRICATION

.1 Fabricate pilasters and stiles minimum 25 mm thick, and panels and doors minimum 25 mm thick, of materials as specified.

.2 Supply steel floor inserts and locations to Contractor for placing prior pouring of floor slab.

.3 Provide pilasters with 2.9 mm, stainless steel leveling bar, rod and anchor concealed by one-piece 102 mm high stainless steel.

.4 Include panel brackets, hinges, door stops, latches, fastening devices, bumpers, and pull on the outside of doors to handicapped accessible compartments.

.5 Coat hooks to be mounted in ALL barrier free washrooms and shall be safety release style and mounted on inside of partition door and/or on side wall of washroom or as shown on drawings.

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Part 3 Execution

3.1 INSTALLATION

.1 Install compartments in accordance with reviewed shop drawings and in a neat, rigid manner free of defects.

.2 Provide anchors, inserts and fixings necessary for attachment of supports. Supply steel floor inserts and locations to Contractor for placing prior pouring of floor slab. Elsewhere, drill supports as required to receive attachment of compartments.

.3 Install units secure, accurately positioned, plumb, level, square and free from sag and distortion. Provide 3 brackets per partition.

.4 Perform drilling of steel, masonry and concrete necessary to install this work.

.5 Ensure spaces between panels and pilasters, between panels and walls and between pilasters and walls are of uniform consistent width and sized to ensure it is not possible to see persons using the compartments.

.6 Coordinate installation with the work of trades providing ceilings, wall and floor finishes, shower accessories and other adjacent components and construction.

.7 Use stainless steel anchors and fasteners; ferrous metals are not acceptable.

.8 Provide for adjustment of ceiling variations with screw jack through steel saddles made integral with pilaster. Conceal fixings with stainless steel shoes.

.9 Do work in accordance with CAN/CSA-B651.

3.2 ADJUSTMENT

.1 Upon completion of the work or when directed, remove all traces of protective coating or paper.

.2 Clean exposed surfaces and fittings.

.3 Test safety release Coat Hooks, hinges, locks and hatches and where necessary, adjust and lubricate. Set hinges so that doors stand open maximum 30 degrees when compartment is not in use. Ensure that partitions are in working order.

END OF SECTION

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Part 1 General

1.1 RELATED SECTIONS

.1 Section 01 33 00 - Submittal Procedures.

.2 Section 05 50 00 – Metal Fabrications.

1.2 REFERENCES

.1 American Society for Testing and Materials (ASTM)

.1 ASTM E90-[99], Standard Test Method for Laboratory Measurement of Airborne-Sound Transmission Loss of Building Partitions and Elements.

.2 ASTM E336-[97], Standard Test Method for Measurement of Airborne Sound Insulation in Buildings.

.2 Canadian General Standards Board (CGSB)

.1 CAN/CGSB-11.3-[M87], Hardboard.

.3 Canadian Standards Association (CSA)

.1 CSA O115-[M1982(R2001)], Hardwood and Decorative Plywood.

.2 CSA O151-[M1978(R1998)], Canadian Softwood Plywood.

.4 Underwriters Laboratories' of Canada (ULC)

.1 CAN/ULC-S102-[1998R2000], Surface Burning Characteristics of Building Materials and Assemblies.

1.3 DESIGN REQUIREMENTS

.1 Use carpet finish for covering with maximum

.1 flame spread -[25];

.2 fuel contributed -[35];

.3 smoke developed -[50]; when tested to CAN/ULC-S102.

1.4 WELDING

.1 Welding of structural components shall be done only by fabricators certified by CSA Welding Qualification Codes, CSA W47 or W55.3 as applicable, for welding of steel, and who shall perform welding to meet specified requirements of CSA W55.2 or W59.1, as may apply.

.2 Weld all connections where possible, and bolt where not possible. Provide method to prevent loosening of nuts. Ream holes drilled for fastenings. Make welded joints tight, flush, and in true planes with base metals. Make welds continuous at joints. Grind welds in exposed locations smooth in a manner that will not leave blemishes on exposed surfaces. Join members generally by inert metal arc welding where practicable, using

materials recommended by manufacturers of metals being welded. Remove flux completely following welding, and grind and polish joints smooth and clean.

1.5 SHOP DRAWINGS

.1 Submit shop drawings in accordance with Section 01 33 00 - Submittal Procedures.

1.6 SAMPLES

.1 Submit samples in accordance with Section 01 33 00 - Submittal Procedures.

1.7 MAINTENANCE DATA AND OPERATING INSTRUCTIONS

.1 Provide maintenance and operating instructions for incorporation into maintenance manual in accordance with Section 01 33 30- Submittal Procedures.

1.8 TEST DATA

.1 Submit test reports to the Consultant from ULC confirming that carpet and vinyl fabric conforms to these Specifications.

.2 Submit tests to confirm STC ratings based on ASTM E90-04.

.3 Submit test reports from an independent laboratory confirming that the partition meets the flame spread and STC ratings specified.

.4 Submit test data indicating compliance with design criteria regarding sound transmission and fire hazard classification.

1.9 WASTE MANAGEMENT AND DISPOSAL

.1 Remove from site and dispose of all packaging materials at appropriate recycling facilities.

.2 Collect and separate for disposal [paper] [plastic] [polystyrene] [corrugated cardboard] packaging material [in appropriate on-site bins] for recycling.

.3 Divert unused [wood] [and] materials from landfill to recycling facility as approved by Consultant.

.4 Fold up metal banding, flatten and place in designated area for recycling.

Part 2 Products

2.1 DESIGN CRITERIA

.1 Use finish for partition covering with maximum flame spread 25; fuel contributed 35; smoke developed 50; when tested to ASTM E84-81a.

.2 Specifications in this Section are based upon products and systems as manufactured by Modernfold. It is understood that certain aspects of partition systems by other

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manufacturers are slightly different than those specified. The Consultant will make some allowances for differing designs when reviewing shop drawings but will insist that the overall system present features and performance which are at least equal to those specified.

2.2 DESCRIPTION OF PARTITIONS

.1 Stage/Gymnasium Partition:

.1 Location: Stage at Gym

.2 Type: Modernfold 931 - STC 50 or approved equivalent by Corflex Partitions, Moderco, Hufcor or C.S.I. Sales and Manufacturing, Aluflex and Moduflex by Panelfold.

.3 Features: Manually operated, single panels, acoustically rated system. Panel facing shall be roll formed steel welded to panel frame. Integral whiteboards and recessed marker tray on stage side of partition on all panels, head and floor retractable seals; end panel modified; end panel modified to suit end wall condition. Carpet finish both sides, colour selection by Consultant from full range.

.4 Opening Size: Refer to floor plan and confirm on site.

2.3 MATERIALS

.1 General: Metals shall be free from defects which impair strength or durability, or which are visible. Metals shall be new, of best quality, and free from rust, or waves, or buckles, clean, straight, and with sharply defined profiles.

.2 Metals:

.1 Steel: Structural: hot rolled to meet requirements of CAN3-G40.21, Grade 50W for tubes and Grade 44W for flat shapes. Sheet: cold-rolled furniture steel, double annealed, mill stretched and levelled, and fully pickled. Otherwise, steel shall be hot-rolled or cold-rolled of alloy to suit needs of fabrication, use, and appearance.

.3 Carpet: Acoustical, non-woven needle punch carpet, with fused fibers to prevent unravelling or fray of material.

.4 Provide min. 100mm high stainless steel kickplates on stage side of all panels.

2.4 COMPONENTS

.1 Overhead suspension system.

.1 Track: manufacturer's standard cold rolled steel channel housing designed to support partitions.

.1 Equip track with brackets for hanger attachment.

.2 Provide threaded steel rods and nuts type hangers and stabilizers.

.2 Trolley: nylon wheels with ball bearings, equipped with thrust bearing and steel pendant bolt at each wheel assembly for height adjustment.

.2 Hardware.

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.1 Equip partition with manufacturer's standard hardware. Hardware finish selected from manufacturer's [standard] [special] finishes.

.3 Sound seals.

.1 Provide sound seals to manufacturer's standard.

.2 Use head and floor retractable compression type floor and head seals.

.3 Design retractable seals to secure panel in position.

.4 Use manufacturer's standard astragal inserts for jamb and panel joint seal. Finish in Satin Black.

2.5 ACCESSORIES

.1 Provide manufacturer's standard closure panel, with lever operator.

Part 3 Execution

3.1 INSTALLATION

.1 Secure and level track.

.2 Install folding partitions in accordance with manufacturer's printed instructions.

.3 Touch up damaged finishes, repair damage to partitions to match original finish.

.4 Clean folding partition system and protect from damage.

.5 Adjust and leave partitions in smooth operating condition.

3.2 SITE TESTS

.1 Provide demonstration of operation to the Owner and his representatives.

.2 Provide training for operation, maintenance and repairs.

END OF SECTION

□

Part 1 General

1.1 RELATED SECTIONS

.1 Section 01 33 00 – Submittal Procedures.

.2 Section 10 21 14 – Metal Toilet Compartments.

.3 Section 10 28 10 – Plastic Toilet Compartments.

.4 Section 08 80 50 – Glazing: Mirrors.

1.2 REFERENCES

.1 American Society for Testing and Materials (ASTM)

- .1 ASTM A167-[99], Standard Specification for Stainless and Heat-Resisting Chromium-Nickel Steel Plate, Sheet, and Strip.
- .2 ASTM B456-[95], Standard Specification for Electrodeposited Coatings of Copper Plus Nickel Plus Chromium and Nickel Plus Chromium.
- .3 ASTM A653/A653M-[99], Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process.
- .4 ASTM A924/A924M-[99], Standard Specification for General Requirements for Steel Sheet, Metallic-Coated by the Hot-Dip Process.

.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 CAN/CGSB-12.5-[M86], Mirrors, Silvered.
- .4 CGSB 31-GP-107Ma-[90], Non-inhibited Phosphoric Acid Base Metal Conditioner and Rust Remover.

.3 Canadian Standards Association (CSA)

- .1 CAN/CSA-B651-[95], Barrier-Free Design.
- .2 CAN/CSA-G164-[M92], Hot Dip Galvanizing of Irregularly Shaped Articles.

1.3 SHOP DRAWINGS

.1 Submit shop drawings in accordance with Section 01 33 00 - Submittal Procedures

.2 Shop drawings of units for use by the handicapped shall be distinctly marked and cross-referenced to the corresponding article in the specifications.

1.4 WASTE MANAGEMENT AND DISPOSAL

.1 Collect and separate plastic, paper packaging and corrugated cardboard in accordance with Waste Management Plan.

□

Part 2 Products

2.1 MATERIALS

.1 Ferrous Steel: Sheet, cold-rolled furniture steel, double annealed, mill stretched and leveled, and fully pickled. Otherwise, steel shall be hot-rolled or cold-rolled of alloy to suit needs of fabrication, use, and appearance.

.2 Galvanized Steel: For sheet, Z275 zinc coating designation in accordance with ASTM Specification A525. For irregular sections, hot dip galvanized to comply with CSA G164.

.3 Stainless steel sheet metal: to ASTM A167, Type 304, with No. 4 finish.

.4 Anchors and Fastenings: Where exposed, use stainless steel and otherwise to match metal anchored. Where non-exposed, use the same as that specified for exposed, or use galvanized steel. Anchors and fastenings shall be of the type appropriate for the substrate to which accessory unit is secured.

2.2 COMPONENTS

.1 Hand Dryers – Semi-recessed (HD): refer to Electrical specifications.

.2 Fixed Grab Bars (GB): 32 mm outside diameter; 1.2 mm thick stainless steel; pended non-slip finish; round or oval concealed flange attachments, as described below:

.1 Straight Profile: e.g. Frost Model 1001-DP-24.
.2 L-Shaped Profile: e.g. Frost Model 1003-DP-30x30.
.3 All bars to have concealed mounting hardware
.4 Quantity: refer to drawings
.5 All bars to withstand horizontal and vertical pull of 2.2 Kn
.6 Location: Washrooms, refer to contract drawings.

.3 Convenience Shelves (CS): Model B295x16 by Bobrick
.1 Quantity: refer to drawings
.2 Location: ashrooms, refer to drawings where noted.

.4 Toilet Paper Dispenser (TD): Model 150 by Frost
.1 Quantity: refer to drawings
.2 Location: Washrooms , refer to drawings.

.5 Paper Towel Dispenser (PTD): Model F101-1 by Frost
.1 Quantity: refer to drawings
.2 Location: refer to drawings.

.6 Soap Dispenser (SD): Model 710A, by Frost
.1 Quantity: refer to drawings
.2 Location: refer to drawings.

.7 Sanitary Napkin Disposal (SN): Model 620, by Frost

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.1 Quantity: refer to drawings
.2 Location: Washrooms, refer to drawings

.8 Sanitary Napkin Dispenser (SND) : Model 615-5, by Frost
.1 Quantity: refer to drawings
.2 Location: Washrooms, refer to drawings

.9 Safety Release Coat Hook (SCH):
.1 Refer to drawings for locations.
.2 High strength polycarbonate coat hook with safety release weight under downward pressure to not exceed 12 kg (26 lbs.)
.3 Supply all suitable mounting hardware for a vandal proof, secure installation using stainless steel sleeve bolts on partition doors or panels. Do not supply standard Robertson or Phillips head screws.
.4 Colours:
.1 Allow for two (3) colours from Manufacturers standard line
.5 Acceptable Materials: “Henkel Hook” as manufactured/distributed by Henkel Diversified Inc, London ON, tel (519) 641-5872.
.6 Locations:
.1 Refer to drawings for locations
.7 Samples: submit test data and samples for review as specified in Section 013330 – Submittal Procedures”

.10 Mirrors

.1 Fixed Mirrors (designation Type **M**):
.1 Best quality, 6 mm thick float glass, with concealed tamperproof clip fasteners.
.2 24 ga., Type 302 or 304 No 4 finish stainless steel frames on all edges and galvanized iron backing with concealed mounts.
.3 Sizes: each unit 610 mm x 914 mm.
.4 Locations: as shown on Drawings.
.5 Acceptable Materials: Frost ‘Stock series’ model 941TG Tempered Glass; 24” x 36” each.
.6 Acceptable alternate: Bobrick B-290, Model 5440 by Twin Cee; or "Tamperproof" model by Pilkington Ford
.2 Fixed Mirrors (designation Type **ML**):
.1 Best quality, 6 mm thick float glass complete with concealed, tamperproof clip fasteners
.2 24 ga., Type 302 or 304 No 4 finish stainless steel frames on all edges and galvanized iron backing with concealed mounts.
.3 Sizes: each unit 610 mm x 1520 mm.
.4 Locations: as shown on Drawings.
.5 Acceptable Materials: Bobrick Model B-290 2460; 24” x 60” each.
.6 Acceptable alternate: equivalent size and details by Frost or Twin Cee
.2 Fixed Mirrors (designation Type **MLH**):

.1 Best quality, 6 mm thick float glass complete with concealed, tamperproof clip fasteners
.2 24 ga., Type 302 or 304 No 4 finish stainless steel frames on all edges and galvanized iron backing with concealed mounts.
.3 Sizes: each unit 610 mm x 1220 mm.
.4 Locations: as shown on Drawings.
.5 Acceptable Materials: Bobrick Model B-290 2448; 24" x 48" each.
.6 Acceptable alternate: equivalent size and details by Bobrick or Twin Cee

2 Fixed Mirrors (designation Type **MC**):
.1 Best quality, 6 mm thick float glass complete with concealed, tamperproof clip fasteners
.2 24 ga., Type 302 or 304 No 4 finish stainless steel frames on all edges and galvanized iron backing with concealed mounts.
.3 Sizes: each unit 610 mm x 610 mm.
.4 Locations: as shown on Drawings.
.5 Acceptable Materials: Bobrick Model B-290 2448; 24" x 24" each.
.6 Acceptable alternate: equivalent size and details by Frost or Twin Cee

.15 Acceptable Alternates to those items listed above as manufactured by Bradley Corp. & Supplied by Wentworth Assoc. Ltd., Frost Products Ltd., Watrous (ASI) or Bobrick Washroom Equipment Co. and Saferail meeting or exceeding these specifications.

2.3 FABRICATION

.1 Construction**:** Fabricate with materials, component sizes, metal gauges, reinforcing, anchors and fasteners of adequate strength to withstand intended use.

.2 Where specified as frameless, provide stainless steel accessories with one-piece fronts having 90 degree formed returns at their edges and openings.

.3 Where accessory fronts are framed, frame edges, both inside and outside, with 90 degree formed returns continuously welded and ground smooth at the corners. Doors shall also have 90 degree formed returns as specified.

.4 Unless otherwise specified, hinges shall be semi-concealed stainless steel piano hinges extending full-length of hinged element. Provide hinged elements with concealed, mechanically-retained rubber bumpers for silent closing, and shall close flush with faces of fronts or frames.

.5 Ensure that work will remain free of warping, buckling, opening of joints and seams, distortion and permanent deformation.

.6 No exposed fixings permitted. Cut edges and openings square and smooth. Chamfer corners of edges and cut-outs 1.6 mm.

.7 Assembly: Accurately cut, machine and fit joints, corners, copes and mitres so that junctions between components fit together tightly and in true planes.

.8 Fasten work with concealed methods, unless otherwise indicated on Drawings.

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.9 Weld all connections where possible, bolt where not possible and cut off bolts flush with nuts. Countersunk bolt heads, and provide method to prevent loosening of nuts. Ream holes drilled for fastening.

.10 Welded joints shall be tight, flush, and in true planes with base metals. Make welds continuous at joints where entry of water into voids of members or assemblies is possible.

.11 Provide for differential movements within assemblies and at junctions of assemblies with surrounding work.

.12 Welds in exposed locations shall be ground and polished smooth.

.13 Finish Work**:** Provide holes and connections for related work installed under other Sections of this specification, if applicable.

.14 Cleanly and smoothly finish exposed edges of materials, including holes.

Part 3 Execution

3.1 INSPECTION OF SECTION

.1 Take site measurements to ensure that work is fabricated to fit surrounding construction around obstructions and projects in place, or as shown on drawings, and to suit service locations.

3.2 INSTALLATION

.1 Install all accessories in accordance with manufacturers' instructions at their recommended mounting heights unless noted otherwise on drawings.

.2 Securely fasten accessories plumb, true, square, straight, level, and accurately and tightly fitted together and to surrounding work. Install in locations shown and specified herein. Mounting heights as shown or in accordance with the OBC in the case of barrier-free accessories.

.3 Work shall include anchor bolts, bolts, washers and nuts, lag screws, expansion shields, toggles, straps, sleeve brackets, clips, and other items necessary for secure installation, as required by loading and by Jurisdictional Authorities.

.4 Attach work at wood by screws through countersunk holes in metal.

.5 Attach work to masonry with lead plugs and non-corrosive fastenings, to support load with a safety factor of 3. Perform all drilling necessary to install the work.

.6 Insulate between dissimilar metals or between metals and masonry or concrete with bituminous paint, to prevent electrolysis.

.7 Coordinate installation with the work of other trades adjacent to accessories to achieve the reveals or other edge conditions shown, where their front faces are flush with the finished wall surfaces.

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.8 Owner to supply and install remainder of washroom accessories not specified here (toilet paper dispensers, etc.). Cooperate with Owner as required.

3.3 CLEANING UP AND ADJUSTMENT

.1 Upon completion of the work, or when directed, remove all traces of protective coatings or paper.

.2 Test mechanisms, hinges, locks and latches, and where necessary, adjust and lubricate and ensure that accessories are in perfect working order.

END OF SECTION

□

Part 1 General

1.1 RELATED WORK

.1 Section 01 33 00 - Submittal Procedures.

1.2 WORK INCLUDED

.1 Supply and install prefabricated unit as specified in location shown on drawings.

.2 Supervision, inspection and checking of unit as installed on site.

1.3 REFERENCES

.1 Drawing designation: “Precast Concrete Storage Shed”. Refer to Site Plan drawing.

1.4 SHOP DRAWINGS

.1 Submit shop drawings in accordance with Section 01 33 00 - Submittal Procedures.

1.5 SAMPLES

.1 Submit samples in accordance with Section 01 33 00 - Submittal Procedures.

1.6 GUARANTEE

.1 Submit a written Guarantee to the Board, that all work of this Tender shall be free from defects in workmanship and materials for a minimum period of one (1) year from date of approved completion.

.2 All defects (excluding vandalism) in materials and workmanship that become apparent during the Guarantee period shall be made good or material replaced at no cost to the Board.

1.7 WASTE MANAGEMENT AND DISPOSAL

.1 Remove from site and dispose of all packaging materials at appropriate recycling facilities.

.2 Collect and separate for disposal paper, plastic, polystyrene, corrugated cardboard, packaging material in appropriate on-site bins for recycling.

.3 Place materials defined as hazardous or toxic in designated containers.

.4 Divert unused metal materials from landfill to metal recycling facility as approved by Consultant.

.5 Unused paint or coating material must be disposed of at an official hazardous material collections site as approved by Consultant.

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.6 Fold up metal banding, flatten and place in designated area for recycling.

.7 Do not dispose of unused paint material into sewer system, into streams, lakes, onto ground or in any other location where it will pose health or environmental hazard.

1.8 LOCATION

.1 Provide four (4) units. Refer to site drawing for location.

Part 2 Products

2.1 MATERIALS

.1 Pre-cast concrete building/storage unit, model Redicast 10, 3000mm x 3000mm, 10 Service Building (MS1024) (10' x 10' x 8'4" high) as manufactured by Anchor Concrete Products Ltd. 1645 Sydenham Road, Kingston, ON K7L 4V4 Tel: (613) 546-6683,1-800-223-0012.

.2 Size: 9'5" x 9'5" x 7'2" high (2.87 x 2.87 x 2.18m) inside.

.3 Weight: 24,000 lbs (10,886 kg) gross.

.4 Construction:

.1 steel reinforced walls, roof & base.

.2 16 ga. painted steel doorframe cast into wall for security.

.3 live roof load 40 p.s.f.

.4 max.wind load 31 p.s.f. (equivalent hourly wind pressure 14.4 p.s.f.)

.5 concrete 4000 p.s.i. minimum.

.6 exposed aggregate walls (natural stone finish)

.7 base, clean smooth (white) concrete.

.8 graffiti resistant exterior coating.

.9 no joints between walls or between walls & roof for superior weather protection and to eliminate maintenance.

.10 delivered and place as (1) piece (no on-site assembly)

.11 seal between walls & base is maintenance free mastic.

.12 (2) heavy duty aluminum vents with birdscreen to provide free area of 120 square inches.

.5 Door & hardware:

.1 (2) 36" x 80" x 1 %"thick hollow metal doors.

.2 16 ga. steel, wipe coated zinc base coat, with one coat galvaprime and two coats gloss exterior alkyd paint.

.3 spot welded edges.

.4 (3) vandal resistant hinges/door (Hagar BB2222x4, 5x4x619xNRP)

.5 steel top cap each door.

.6 aluminum & fibre door sweep bottom

.7 Schlage B160N deadbolt lock, standard (can be fitted with spec lock to match existing sets)

.8 Keying to be confirmed with Consultant.

.9 Both doors w/ spring softened chain checks (Mallory 1225).

.10 fixed doors w/top & bottom surface bolts (onward564)

Part 3 Execution

3.1 INSTALLATION

.1 For concrete or asphalt surface: Bearing pads to be provided if levelling is required

.2 For grass site: 11'0" x 11'0" x 6" thick compacted stone chip base with 2" loose stone chips on top.

.3 Comply manufacturer's installation instructions and approved shop drawings.

END OF SECTION

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Part 1 General

1.1 RELATED SECTIONS

.1 Section 01 33 00 – Submittal Procedures.

1.2 SUBMITTALS

.1 Product Data:

.1 Submit manufacturer's printed product literature, specifications and data sheet in accordance with Section 01 33 00 - Submittal Procedures.

.2 Shop Drawings:

.1 Submit shop drawings in accordance with Section 01 33 00 - Submittal Procedures.

.3 Samples:

.1 Submit samples in accordance with Section 01 33 00 - Submittal Procedures.

.4 Manufacturer's Instructions:

.1 Submit manufacturer's installation instructions.

1.3 WASTE MANAGEMENT AND DISPOSAL

.1 Remove from site packaging materials at appropriate recycling facilities.

.2 Dispose of recyclable packaging material in appropriate on-site bin for recycling.

Part 2 Products

2.1 MATERIALS

.1 Metal Lockers:

.1 Single Tier: 305 wide x 380 deep x 1828 high Fabricate from cold rolled steel, with plastic bottom shelf (floor), min. Unless noted; lockers will mount on 100 mm concrete base. Location: throughout school in corridors.

.2 Double Tier: 305 wide x 380 deep x 1828 high Fabricate from cold rolled steel, with plastic bottom shelf (floor), min. Metal base. Location: Childcare Staff Room 313.

.3 Lockers must be fabricated with the following attributes:
1. Minimum 16 Gauge Doors
2. 16 Gauge Interior Shelves
3. Minimum 18 Gauge Slope/Fillers/End Panels
4. Minimum 24 Gauge Sides/Backs
5. Solid Plastic Bottom Shelves
6. ASTM D3363 - Ultra Anti-Graffiti Coating Paint with 4H Rating

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.4 Locker Count: refer to drawings for quantity of lockers required for entire school

.5 Continuous piano hinge, recessed extruded aluminum lock pocket, metal hasp with no moving part for padlock, individual number plate,

.6 Inside Equipment: 2 metal shelves (one near top and one near mid height), 2 hooks (one on side wall near top and one on side wall at underside of mid height shelf.)

.7 Sloping Tops: pre-finished steel; c/w clips and other attachment devices.

.8 Shelves shall have rolled fronts and rear flanges. Provide 25 mm air space between shelf and back of locker for ventilation. Install shelves at height to be determined by Architect at shop drawing stage.

.9 Colours: Allow for 3 colours: single standard colour for the frame with contrasting doors in one standard colour and one custom colour to later selection by Architect.

.10 Lockers to be installed on a 100 mm concrete base, unless otherwise noted.

.11 Acceptable products: providing they meet or exceed all details of this specification as provided by:

.1 ASI Group Canada Inc.

.2 Canadian Washroom Products

.3 G.R.B. Storage Systems Inc.

.4 William Knell and Company Ltd.

.5 Hadrian Manufacturing Inc.

.6 Global Storage Systems

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 INSTALLATION

.1 Install where indicated on drawings and as per manufacturer’s instructions.

3.3 DEMONSTRATION AND TRAINING

.1 Provide demonstration of operation to the Owner and his representatives.

.2 Provide training for operation, maintenance and repairs.

3.4 CLEANING

.1 Perform cleaning after installation to remove construction and accumulated environmental dirt.

.2 Clean surfaces after installation using manufacturer's recommended cleaning procedures.

.3 Clean aluminum with damp rag and approved non-abrasive cleaner.

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.4 Upon completion of installation, remove surplus materials, rubbish, tools and equipment barriers.

END OF SECTION

□

Part 1 General

1.1 RELATED DOCUMENTS

.1 Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SCOPE OF WORK

.1 Supply all labour, materials, methods, equipment, and inspections to supply, fabricate, and place landscape structures shown on drawings, specified herein and as required for a complete and proper installation of;

.1 10x20’ Outdoor Classroom

.2 10x12’ Cedar Shade Pergola (3)

1.3 ACTION AND INFORMATIONAL SUBMITTALS

.1 Provide in accordance with Section 01 33 00- Submittal Procedures.

.2 Product Data:

.1 Provide manufacturer's instructions, printed product literature and data sheets for structures and include product characteristics, performance criteria, physical size, finish and limitations.

.3 Shop Drawings:

.1 Furnish shop drawings bearing the seal of an Professional Structural Engineer registered in the Province of Ontario to indicate proper construction in compliance with all local codes including, but not limited to, wind ratings, snow load bearing, frost protected footings, spacing of posts and drainage of precipitation. in accordance with Ontario Building Code.

.2 Shop Drawings to include: layout dimensions, sizes, assembly, materials, finishes, hardware, framing, cross sections, trim, anchorage, footings, and installation details for each structure specified.

.4 Samples:

.1 Samples for verification: Provide representative samples of materials used, when requested by Consultant. Samples to indicate thickness, color and finishes expected upon project completion.

1.4 DELIVERY, STORAGE AND HANDLING

.1 Deliver, store and handle materials in accordance with Section with manufacturer's written instructions.

.2 Delivery and Acceptance Requirements: deliver materials to site in original factory packaging, labelled with manufacturer's name and address.

.3 Storage and Handling Requirements:

.1 Store materials in accordance with manufacturer's recommendations.

.2 Store and protect structure materials from damage.

.3 Replace defective or damaged materials with new.

1.5 FIELD CONDITIONS

.1 Field Measurements: Verify layout information for landscape structures shown on drawings in relation to property survey and existing structures. Verify dimensions by field measurements.

.2 Weather Limitations: Proceed with installation only when existing and forecast weather conditions permit work to be performed and at least one coat of specified finish can be applied without exposure to rain, snow, or dampness.

.3 Do not install finish carpentry materials that are wet, moisture damaged, or mold damaged.

.1 Indications that materials are wet or moisture damaged include, but are not limited to, discoloration, sagging, or irregular shape.

.2 Indications that materials are mold damaged include, but are not limited to, fuzzy or splotchy surface contamination and discoloration.

1.6 QUALITY ASSURANCE

.1 The manufacturer shall provide evidence of experience designing and producing at least five prior projects of similar scope in the past three years.

.2 The erector shall provide evidence of experience completing at least five prior projects of similar scope in the past three years.

1.7 WARRANTY

.1 Warranty Period: 1 year from date of Substantial Completion.

Part 2 Products

2.1 MATERIALS

.1 Wood:

.1 Lumber to be factory marked with grade stamp of inspection agency indicating grade, species, moisture content at time of surfacing, and mill.

.2 All wood for structures to be No.1 STK Western Red Cedar, rot resistant, colour consistent, kiln dried lumber, unless specified otherwise.

2.2 MISCELLANEOUS MATERIALS

.1 Structural Wood Connections and Fasteners: Stainless steel or galvanized and powder coated as per reviewed structurally engineered shop drawings.

.2 Fasteners for Finish Carpentry: Provide stainless steel screws, in sufficient length to penetrate not less than 38 mm into wood substrate.

.3 8x8 Post base: Simpson Strong Tie Outdoor Accents APVB Adjustable Post Base or equivalent.

.4 Wood protector waterproofing sealant: Finish: Sikkens Proluxe Cetol Log and Siding Wood Stain, Clear

.5 Concrete Footings:

.1 Refer to 03 30 01 Landscape Cast In Place Concrete.

.2 Concrete footings above grade to have rounded edges.

.3 Form materials shall not be visible above grade.

Part 3 EXECUTION

3.1 EXAMINATION

.1 Examine substrates, with installer present, for compliance with requirements for installation tolerances and other conditions affecting performance.

.2 Examine finish carpentry materials before installation. Reject materials that are wet, moisture damaged, and mold damaged.

.3 Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 INSTALLATION, GENERAL

.1 Do not use materials that are unsound, warped, improperly treated or finished, inadequately seasoned, or too small to fabricate with proper jointing arrangements.

.2 Install structures level, plumb, true, free from distortion or defects, to the highest standards of the trade and in strict accordance with the engineering drawings and manufacturers instructions.

.3 Securely fasten all hardware and tighten nuts and bolts in accordance with engineering drawings.

.4 Conceal bolts and screws whenever possible. Where not concealed, use flush countersunk fasteners.

.5 All exposed fasteners, bolts and screws are to be cut back to 6mm maximum or preened and be smooth to the touch as to be safe for a children’s play environment.

.6 Touch-up any irregular finishes according to manufacturers instructions.

.7 All wood materials to be free of splinters and sanded smooth to the touch.

3.3 ADJUSTING

.1 After completing installation, inspect exposed finishes and repair damaged finishes according to manufacturer's instructions.

3.4 CLEANING

.1 Clean landscape structures as recommended by manufacturer. Touch up factory-applied finishes to restore damaged or soiled areas.

3.5 PROTECTION

.1 Protect installed products from damage from weather and other causes during construction.

END OF SECTION

Part 1 General

1.1 DESCRIPTION OF WORK

.1 General conditions and Division 1 shall govern work of this section.

1.2 RELATED WORK

.1 Section 03 10 01 Landscape Concrete Formwork and Accessories

.2 Section 03 30 01 Landscape Cast-in-Place Concrete

1.3 REFERENCE STANDARDS

.1 Comply with all pertinent building codes and regulations.

.2 Ontario Provincial Standard Drawings

.1 OPSD-2200.011 Raised Concrete Footing for Base Mounted Lighting Poles

.2 OPSD-2215.02 Anchorage Assembly For Lighting And Signal Poles

.3 OPSD-2215.03 Pole Mounting Details for Base Mounted Metal Pole

1.4 ACTION AND INFORMATIONAL SUBMITTALS

.1 Submit in accordance with Section 01 33 00- Submittal Procedures.

.2 Shop Drawings:

.1 Submit foundation and reinforcement drawings stamped and signed by professional engineer registered or licensed in Ontario, Canada.

.2 Indicate materials, core thicknesses, finishes, connections, joints, method of anchorage, number of anchors, supports, reinforcement, details, and accessories.

1.5 DELIVERY, STORAGE AND HANDLING

.1 Deliver, store and handle materials in accordance with Section with manufacturer's written instructions.

.2 Delivery and Acceptance Requirements: deliver materials to site in original factory packaging, labelled with manufacturer's name and address.

.3 Storage and Handling Requirements:

.1 Store materials in dry location off ground and in accordance with manufacturer's recommendations in clean, dry, well-ventilated area.

.2 Replace defective or damaged materials with new.

Part 2 Products

2.1 MATERIALS

.1 Flagpole

.1 Product:

.1 Tapered aluminum flagpole: Model “HCAN” as manufactured by Ewing.

.2 Cone tapered models meeting or exceeding these criteria will be accepted as alternate products.

.3 Acceptable Alternates: John Ewing or All-Canadian Flagpole Co.

.2 Dimensions and Components:

.1 Minimum 9150 mm high (30'), complete with tilt anchor base, base cover, and concrete anchors.

.2 Shaft to be fitted with an internal #12 braided nylon halyard revolving truck system, stepped shaft aluminum alloy 6063-T6 (butt 127 o.d., butt wall 4.8 mm).

.3 Ball -152 mm in diameter, color ball: clear anodized.

.4 Base cover spun aluminum alloy 6061, 254 mm in diameter, wall thickness of 2.3mm.

.3 Finish:

.1 Finish of pole and accessories: Clear anodized.

.4 Quantity: 1

.2 Concrete

.1 Refer to Section 03 30 01 Landscape Cast in Place Concrete.

.3 Other Materials

.1 All other materials, not specifically described but required for a complete and proper installation, shall be new, first quality of their respective kinds and subject to the review of the Consultant.

Part 3 Execution

3.1 INSTALLATION

.1 Install flagpoles, base assemblies and fittings to approved shop drawings and manufacturer's instructions.

.2 Provide concrete base using ArtForm formwork per Section 03 10 01 Landscape Concrete Formwork and Accessories, and extend base a minimum of 2600mm deep. Cast and cure bases in accordance with requirements of Section 03 30 01, Landscape Cast-In-Place Concrete.

.3 Reinforce concrete base with vertical steel reinforcing rods and horizontal steel reinforcing ties as per approved and stamped structural shop drawings.

.4 Provide positive lightning grounding for each installation. Provide a 19mm diameter, 3000mm long copper coated steel ground rod adjacent to pole and connect to metal pole with bare copper conductor.

3.2 CLEANING

.1 Progress Cleaning: Leave Work area clean at end of each day.

.2 Final Cleaning: upon completion remove surplus materials, rubbish, tools and equipment.

3.3 PROTECTION

.1 Protect installed products and components from damage during construction.

.2 Repair damage to adjacent materials caused by metal fabrications installation.

END OF SECTION

Part 1 General

1.1 RELATED SECTIONS

.1 Section 01 33 00 - Submittal Procedures.

.2 Section 03 30 00- Cast-in-Place Concrete.

.3 Section 04 21 13 – Masonry.

.4 Section 05 21 10 – Steel Joists Framing.

.5 Section 05 50 00 – Metal Fabrications.

.6 Electrical Connections : Division 26 (16)

1.2 REFERENCE STANDARDS

.1 All gymnasium equipment shall meet all regulatory requirements of the International Amateur Athletics Federation (I.A.A.F.) for official tournament play as well as all safety standards as set forth by CSA and/or CGSB for the applicable equipment item and/or category, as well as all local codes and regulations.

1.3 SHOP DRAWINGS

.1 Submit shop drawings in accordance with Section 01 33 00 - Submittal Procedures.

.2 As part of Shop Drawings, details of attachment to the building structure (walls and roof structure) must bear stamp of a professional engineer licensed to design structures in the Province of Ontario certifying their strength and safety.

.3 Clearly indicate fabrication details, plans, deviations, hardware and installation details.

.4 Take measurements on site of spaces and conditions to which work must conform.

.5 At completion of installation provide written certification from professional engineer that the installation is structurally safe and in accordance with approved shop drawings.

1.4 PROTECTION

.1 Protect work from damage during storage, handling, installation and until building is turned over to the Owner.

1.5 WASTE MANAGEMENT AND DISPOSAL

.1 Remove from site and dispose of all packaging materials at appropriate recycling facilities.

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.2 Collect and separate for disposal paper, plastic, polystyrene, corrugated cardboard packaging material [in appropriate on-site bins] for recycling Divert unused metal materials from landfill to metal recycling facility as approved by Consultant.

.3 Unused paint or coating material must be disposed of at an official hazardous material collections site as approved by Consultant.

.4 Fold up metal banding, flatten and place in designated area for recycling.

1.6 PROTECTION

.1 Protect work from damage during storage, handling, installation and until building is turned over to the Owner.

Part 2 Products

2.1 MATERIALS

.1 Motorized Basketball Backstops to Main Court:

.1 Location: Ceiling mounted at Main Court. Total of two complete assemblies required.

.2 Steel frame: 3mm thick steel tubing, 50x50mm size, eg. BB-15RG by Gymnasium & Health Equipment Ltd.

.3 Safety Belt: BB-48 Auto-Loc by Gymnasium & Health Equipment Ltd. One required for each ceiling suspended backstop assembly.

.4 Backboard: 1067 x 1829mm size, 13mm thick tempered glass set in extruded aluminum frame, official border and target area fired into glass, BB-29-RGII by Gymnasium & Health Equipment Ltd.

.5 Cushion Edge Padding: pre-moulded urethane foam, purpose made to fit along lower edge of glass backboard, c/w fixing hardware, colour shall be selected by Consultant, BB-44 by Gymnasium & Health Equipment Ltd.

.6 Goal: 457mm OD, front mounted shock absorber goal, with completely enclosed positive locking mechanism, BB-33B by Gymnasium & Health Equipment Ltd.

.7 Net: 120 count nylon, hourglass design, official anti-whip net, BB-41 by Gymnasium & Health Equipment Ltd.

.8 Electric winch: model TW1000 for electrically-operated ceiling-suspended backstops, complete with flush wall-mounted key switch mounted 1350mm above finished floor.

.2 Basketball Backstops at Cross Courts:

.1 Location: At cross courts. A total of four (4) complete assemblies are required.

.2 Backstops: BB-12 with BB-3 height adjustor by Gymnasium and Health Equipment, Markham.

.3 Backboard, Goal and Nets: Model BB-22 backboard with target orange border area, Model BB-30 and net BB-40 and hardware all by Gymnasium and Health Equipment, Markham.

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.4 Operator: Not required.

.5 Safety Straps: not required.

.6 Supply all framing, wall anchor bolts, stringers, mounting hardware for a complete operating installation. Framing finish: enamel paint, custom colour.

.3 Co-ordination for Items 2.1 and 2. 2:

.1 Provide Section 04 22 00- Masonry with all mounting locations, types and hardware for wall-mounted backstops.

.2 Co-ordinate design of swing up type to permit maximum clear height in up position.

.4 Floor Sockets:

.1 Supply and install Model MA Series, 47.6 mm (1-7/8") I.D. By Murray Anderson Ltd. complete with retainer ring, removable cap and threaded assembly. Refer to Drawings for detail.

.2 Locations: As located on Drawings (designation FS).

.3 Provide six (6) additional floor sockets in Gym Storage 154. Location to be confirmed by Owner prior to installation.

.5 Gymnasium Divider Curtain:

.1 Type: Electrically operated, vertically folding divider curtain. Curtain is to fold accordion style.

.2 Curtains: Abrasion resistant polyester reinforced vinyl for the lower 3m, the remaining upper section being 1¼" net.

.1 curtain weight 25 oz/sq yd minimum.

.2 Tensile strength: 300 lb minimum.

.3 Tear strength: 100 lb minimum

.4 Vinyl curtain and net to meet ULC S109, S102.2 and NFPA 701, flame spread not to exceed 75. Fire label to be fixed permanently to the curtain.

.5 Curtain to have vertical welded seams at 1.5 m interval and side shall be hemmed and quadruple sewn to provide clean and durable edge. Seam strength to equal fabric strength.

.6 Colour: To later selection by Consultant from manufacturer's full range.

.3 Valence: same material as curtain fabric on each side of retracted curtain and motor mechanism so as to fully conceal curtain and motor.

.4 Raising mechanism:

.1 motor drive unit, 3 phases, 208V, equipped with magnetic contractor to reverse movement of the curtain at any point, an emergency break and travel limit switches for up and down position.

.2 Lifting pullies at 3 m o.c. attached to the structure, lifting cables to be 5 mm aircraft type.

.3 All roller chains tension shall be monitored by safety switches.

.4 Hydraulic emergency stopping device shall be installed to prevent the free fall of the curtain or to limit the descending speed.

.5 The operating control shall be spring leader type key switch.

□

.5 Mounting Hardware:

.1 include all mounting hardware for a complete installation

.2 Refer to structural drawings and include all subframing required to fasten to structure. The curtain mount is to be designed to allow the curtain to be raised within the centre joist space.

.6 Warranty: Total warranty for a period of 5 years

.7 Acceptable products: noting or exceeding these specifications 1100 Series by Corflex Partitions Inc. or Moderco Inc., Arpro Folding partitions, Porter, Hufcor, or Quad.

.6 Acceptable Alternates to Specified Products:

.1 Products and complete systems meeting or exceeding the quality and features specified as manufactured by Porter and supplied by Hussey Seating Co.; or Laurentian Gymnastics Industries Ltd.; or Sheridan Gym Equipment or Centaur Products Inc; or Ash-Stevenson or Forum Athletic Products Inc.

Part 3 Execution

3.1 FABRICATION

.1 Fix and assemble work in shop where possible.

.2 File and grind exposed welds, smooth and flush. Make exposed welds continuous.

.3 Workmanship shall be best grade of modern shop and field practice known to recognized manufacturers specializing in this work. Accurately fit joints and intersecting members and made in true planes with adequate fastening.

3.2 INSTALLATION

.1 Install work square, plumb, straight, true and accurately fitted.

.2 Included anchors, dowels and fastenings necessary to anchor work together or to work of other trades.

.3 Where installing in masonry, centre equipment between masonry block joints unless indicated otherwise on details. Verify location mounting heights, and dimensions of all units before installation. Anchor in accordance with manufacturer’s printed instructions.

.4 Insulate where necessary to prevent electrolysis between dissimilar materials.

.5 Co-ordinate installation of floor sockets with Section 09 65 19.

.6 Install, connect, make operational and adjust all electrically operated components for proper function.

.7 Deliver to Owner all special tools, accessories, controls, spare parts, etc. which are related to the work of this Section.

3.3 DEMONSTRATION AND CLEANING

.1 Provide demonstration of operation to the Owner and his representatives.

□

.2 Provide training or maintenance and repairs to the Stage Rigging and Drapery.

END OF SECTION

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Part 1 General

1.1 STANDARDS

.1 All play equipment to be installed to current CSA playground safety standards.

.2 All play equipment to be installed according to manufacturer's specifications.

.3 Where manufacturer's methods or site conditions contravene current Canadian playground standards the contractor must inform the Landscape Architectural Consultant immediately.

1.2 ACTION AND INFORMATIONAL SUBMITTALS

.1 Provide in accordance with Section 01 33 00 - Submittal Procedures.

.2 Product Data:

.1 Provide manufacturer's instructions, printed product literature and data sheets for structures and include product characteristics, performance criteria, physical size, finish and limitations.

.2 Provide manufacturer’s colour chart for play element components for consultant selection.

.3 Shop Drawings:

.1 Shop Drawings to include: indicate layout dimensions, sizes, assembly, materials, finishes, hardware, cross sections, anchorage, footings, and installation details for each play piece specified.

.4 Manuals:

.1 Provide Owner with manufacturer’s maintenance manual.

1.3 PRODUCT DELIVERY, STORAGE AND HANDLING

.1 Protect all materials from damage during transportation to the site.

.2 On delivery, store all materials off the ground and protect from adverse conditions to prevent deterioration, damage, or impairment of structural or other essential properties.

.3 All damaged or deteriorated materials will be rejected and must be removed from the site immediately.

1.4 PLAY AREA EDGING

.1 Contractor is responsible to ensure that concrete play area edge has been installed to allow installation of specified play equipment to meet CSA standards. Coordination of all work is the responsibility of the contractor and all costs associated with non-compliant installation are the responsibility of the contractor.

Part 2 Products

2.1 MATERIALS

.1 Basis of Design where indicated;

- .1 Play Equipment as supplied by Natures Instruments
- .2 Approved equivalent.

.2 Play Posts

- .1 Product: NI-PG-601-01 – Wacky Posts, or approved equivalent.
- .2 Posts: red or white oak hardwood logs, peeled and sanded, treated with exterior grade spar urethane.
- .3 Dimensions: 203-330mm diameter, to be embedded min. 760mm below finished grade, 1525-1830mm height.
- .4 Concrete Footing: Refer to Section 03 30 01 Landscape Cast in Place Concrete.
- .5 Quantity: 18

.3 Horizontal Log Border

- .1 Product: NI-PG-605 – Horizontal Log Border and Barrier-Free Log Border, or approved equivalent.
- .2 Logs: cedar logs, peeled and sanded, free of splinters. Portions of log in contact with the ground to be treated with two coats of clear wood preservative.
- .3 Dimensions: 300mm diameter, vary in height between 200mm above grade, minimum 1/3 embedded
- .4 Fasteners: 250mm length SWDS Screws
- .5 Granular: Granular ‘A’ to OPSS 1010
- .6 Quantity: as required by design layout

.4 Vertical Log Border

- .1 Product: NI-PG-606-17.02 Vertical Log Border – 12 in. HW, or approved equivalent.
- .2 Logs: cedar logs, peeled and sanded, free of splinters. Portions of log in contact with the ground to be treated with two coats of clear wood preservative.
- .3 Dimensions: 305mm diameter, vary in height between 150&450mm above grade, 1200mm minimum depth below grade.
- .4 Granular: 19mm clear stone to OPSS 1004
- .5 Quantity: as required by design layout

.5 Cluster Stepping Logs

.1 Product: NI-PG-606-15 Log Cluster – 5 Piece, or approved equivalent.

.2 Logs: cedar logs, peeled and sanded, free of splinters. Portions of log in contact with the ground to be treated with two coats of clear wood preservative.

.3 Dimensions: 305mm diameter, vary in height between 150&450mm above grade, 250mm minimum depth below grade.

.4 Granular: 19mm clear stone to OPSS 1004

.5 Filter Fabric: 270R Terrafix or equivalent

.6 Quantity: 2 sets

.6 Stepping Logs

.1 Product: NI-PG-602 Stepping Rounds, 18" – 5 Piece, or approved equivalent.

.2 Logs: cedar logs, peeled and sanded, free of splinters. Portions of log in contact with the ground to be treated with two coats of clear wood preservative.

.3 Dimensions: 305mm diameter, vary in height between 150&450mm above grade, 250mm minimum depth below grade.

.4 Concrete Footing: Refer to Section 03 30 01 Landscape Cast in Place Concrete.

.5 Granular: 19mm clear stone to OPSS 1004

.6 Quantity: 5

.7 Wood Activity Table

.1 Product: NI-PG-701-05 – Stump Tables, or approved equivalent

.2 Table: red or white oak hardwood stump, peeled and sanded, treated with exterior grade spar urethane.

.3 Dimensions: 601-762mm diameter stump, minimum 100mm below grade,

.1 Toddler height above grade: 405mm

.2 Preschool height above grade: 457mm

.3 Kindergarten height above grade: 508mm

.4 Concrete Base: Refer to Section 03 30 01 Landscape Cast in Place Concrete.

.5 Fasteners: Galvanized Steel cleats

.6 Quantity: 6

.8 Wood Activity Seat

.1 Product: NI-PG-702-03 & NI-PG-702-04 – Stump Seats, or approved equivalent

.2 Table: red or white oak hardwood stump, peeled and sanded, treated with exterior grade spar urethane.

.3 Dimensions: 300mm & 600mm diameter stumps

.1 Toddler height above grade: 203mm

.2 Preschool height above grade: 254mm

.3 Kindergarten height above grade: 305mm

.4 Concrete Footing: Refer to Section 03 30 01 Landscape Cast in Place Concrete.

.5 Fasteners: Galvanized Steel cleats

.6 Quantity:

.1 300mm dia.: 21 total

.2 600mm dia.: 15 total

.9 Activity Table in Sand

.1 Product: NI-PG-701-01 – Activity Table 36", or approved equivalent

.2 Posts: cedar logs, peeled and sanded, free of splinters. Portions of log in contact with the ground to be treated with two coats of clear wood preservative.

.3 Table: 38x89mm Cedar boards, sanded, secured and fastened together with stainless steel hardware. Assembled table top to be 914mm diameter

.4 Dimensions:

.1 Preschool height above grade: 460mm

.2 Kindergarten height above grade: 510mm

.5 Concrete Footing: Refer to Section 03 30 01 Landscape Cast in Place Concrete.

.6 Quantity: 2

.10 Accessible Sensory Table

.1 Product: NI-PG-507-01 – Mud Kitchen, or approved equivalent

.2 Posts: 200mm dia. cedar logs, peeled and sanded, free of splinters. Portions of log in contact with the ground to be treated with two coats of clear wood preservative.

.3 Table Support: 225mm dia. cedar logs, planed both sides, peeled, and sanded, free of splinters.

.4 Table: 50x89mm Cedar boards, sanded, secured and fastened together with stainless steel hardware. Assembled table top to be 1800(L) x 610 (W).

.5 Basin: Stainless steel, removable.

.6 Dimensions: 457mm diameter stump

.1 Preschool height above grade: 510mm

.2 Kindergarten height above grade: 610mm

.7 Concrete Footing: Refer to Section 03 30 01 Landscape Cast in Place Concrete.

.8 Quantity: 2

.11 Log Seating

.1 Logs: cedar logs, peeled and sanded, free of splinters. Portions of log in contact with the ground to be treated with two coats of clear wood preservative.

.2 Dimensions: 300mm diameter, vary in height between 170-210mm above grade

.3 Reinforcement: 15M epoxy coated rebars

.4 Granular: 19mm clear stone to OPSS 1004

.5 Quantity: 11 – Straight, 4 – Zig-Zag

.12 Cedar Deck:

.1 Frame: 140x140mm Western Red Cedar timbers, of sufficient length to complete courses with full timbers.

.2 Joists: 38x140mm No. 1 grade cedar lumber.

.3 Deck Boards: 38x140mm Western Red Cedar lumber, of sufficient length to complete length of decking with full members.

.4 Fasteners: SDWS Screws

.5 Posts: Refer to Play Posts

.6 Quantity: 2 Decks

.13 Play Panel

.1 Product: NI-PG-30X-01 – Creative Panels, or approved equivalent

.2 Posts: 89x89 cedar posts, sanded, free of splinters. Portions of post in contact with the ground to be treated with two coats of clear wood preservative.

.3 Panel: Chalkboard, Acrylic Mirror Panel or Acrylic Transparent Panel

.4 'L" base & Cap: 38x140 cedar lumber, sanded, free of splinters. Portions of post in contact with the ground to be treated with two coats of clear wood preservative.

.5 Pull Up Bar: 40mm dia. red or white oak handrail, sanded, treated with exterior grade spar urethane.

.6 Dimensions: 2667mm (L) x 1435mm(H)

.7 Concrete Footing: Refer to Section 03 30 01 Landscape Cast in Place Concrete.

.8 Quantity: 8 Panels

.1 4 chalk board inserts

.2 3 transparent acrylic panel inserts

.3 3 mirror inserts

.14 Storage Cabinet

.1 Product: NI-PG-707-01 – Curriculum Cabinet, or approved equivalent

.2 Quantity: 4

Part 3 Execution

3.1 INSTALLATION

.1 Use installers that have completed CSA certified installations within the last year.

.2 Lay out play structure as indicated on drawings and in accordance with setbacks indicated in the CSA Guidelines.

.3 Check and verify all site dimensions. Report any discrepancies immediately to the Landscape Architect.

.4 Excavate post holes for play equipment to 1200mm minimum depth into compacted or undisturbed subgrade. Where concrete footings are required by manufacturer's instructions, top of concrete footings to be below the bottom level of play surface, 1200mm minimum depth. Utilize a construction level to set base elevations.

.5 Ensure that all decks are set to correct height and that all posts are plumb. Allow 24 hours for concrete footings to set before commencing installation of play structures.

.6 Following installation of play equipment install rubber play surface to meet current CSA fall height protection standards.

3.2 FINISHING

.1 Touch up paint work, sealant and jointing as required and to the satisfaction of the Landscape Architect.

.2 All sharp edged to be sanded smooth to the touch as to be safe in a children's play environment.

3.3 CERTIFICATION

.1 Installer of play equipment to provide Owner with written certification that play equipment installation meets the current CSA guidelines.

.2 Certification of play equipment to be completed by person who is a certified CSA playground inspector.

END OF SECTION

Part 1 General

1.2 RELATED WORK

.1 Section 08 44 13 – Glazed Aluminum Curtain Walls
.2 Section 08 50 00 – Aluminum Windows

1.3 SUBMITTALS

.1 Product data:
  .1 Submit duplicate copies of manufacturer's Product data in accordance with Section 01 33 00 indicating:
    .1 Performance criteria, compliance with appropriate reference standard(s), characteristics, limitations, and finishes.
    .2 Product transportation, storage, handling and installation requirements.

.2 Shop drawings:
  .1 Submit shop drawings in accordance with Section 01 33 00.
  .2 Provide layout, details of track and operating hardware, installation details.

.3 Samples: Submit 600 mm x 600 mm duplicate samples of Dual Sun Shade material and colour.

.4 Closeout submittals:
  .1 Submit following for each Product for incorporation into Operations and Maintenance Manuals in accordance with Section 01 78 00:
    .1 Functional description detailing operation and control of components.
    .2 Performance criteria and maintenance data.
    .3 Operating instructions and precautions.
    .4 Safety precautions.
  .2 Submit maintenance data, wrenches or specialty tools, cleaning and maintenance instructions

1.5 QUALITY ASSURANCE

.1 Shades and track shall be installed by a qualified specialist with 5 years proven experience in this type of work.

Part 2 Products

2.1 MATERIALS

.1 **Motorized Shading System (MRS):**
  .1 Extruded aluminum hanger and closure using a linear motor, fabloc tube and necessary electrical accessories for a single switch or Motor group control operated as indicated on the Shading Schedule. Internal limit switches are adjusted by two hex keys to allow for exact stop positions. Solenoid activated disc brake stops and holds in any position. Asynchronous motor with built in reversible capacitor start

and run, 95-125V-AC at 60Hz CSA and UL approved.

.2 Specifications are based on 300 Series Solarblock 3%, colour to be selected later by Consultant.

.3 Locations: Gym

.4 'Motorized Shade with wall mount fascia' by Solarfective or approved alternative.

.5 Manufactured by Solarfective Products Ltd., Rep: Patri Products, Kevin Booth (416)421-3800 Fax: (416)421-8424, or Silent Gliss Model 4110 by Architectural Products, Rep. Tim MacCallum Tel: (905)507-1275 Fax: (905)507-1282 or Mecho/5 Model by CartsPlus Healthcare Products Ltd., Rep. Eva Speziale Tel: (905) 602-6794.

.6 All shades systems specified in this section shall be provided by one manufacturer who shall take full responsibility for the total individual school project.

.2 **Manual Shading System (RS):**

.1 Manual operated window shades.

2.2 Shading fabric:

.1 Shade cloths shall be woven of .018 opaque, vinyl coated polyester yarn consisting of approx. 79% vinyl and 21% 500 dernier polyester core yarn. The fabric shall be tensioned in the finishing range prior to heat setting to keep the warp ends straight and minimize or eliminate weave distortion to keep the fabric flat. The fabric shall be dimensional stable. Colour will be selected from standard range. It shall be tear resistant meeting NFPA 701.

.2 Meet or exceed the following statistics:

Openness Factor			3%+0.0%-0.5%
Weight per sq.yd.			21 oz.
Warp ends per inch			42
Fill ends per inch			31
Stretch % (271lb.wt.):	warp		2%
	fill		3%
Set %	warp		1.5%
	fill		1.5%
Abrasion Resistance		YARN	none
(500 Tarber Cycles)		RAPTURE	none
		WEAR	TRACE
U.V. Deterioration		Fade	none
(200 Sun Fade Hours)			
Tensile Retention			96%

2.2 FABRICATION

.1 Fabricate shades in accordance with reviewed shop drawings and manufacturer's written instructions.

Part 3 Execution

3.1 INSTALLATION

.1 Securely install shades and track adding brackets as required but in no case less than four brackets.

.2 After installation fabric shall hang flat, without buckling or distortion. The edge when trimmed, shall hang straight without ravelling. An unguided roller shade cloth shall roll true and straight, without shifting sideways more than 3mm in either direction due to warp distortion, or weave design.

3.3 ASSEMBLY – MOTORIZED SHADE

.1 Extruded Aluminum Shade Tube: 1.52 mm thick, 75 mm diameter with three internal, continuous fins 4.82 mm high for strength and drive capabilities when attached to the nylon sprocket. The fins shall be spaced 120 degrees apart.

.2 Fascia: 1.7 mm thick, extruded aluminum cover, clear anodized finish. To cover front of shade and return at underside to conceal roller and hardware.

.3 Internal Limit switches: adjustable with two hex keys to allow exact setting of stop position. Micro switches to provide circuit breaking at end of run. Switch setting not to be disturbed by roller tube action.

.4 Brake: solenoid activated disc brake mechanism stops and holds any position, brake to disengage when motor is running.

.5 Motor: Built-in reversible capacitor start and run. Single phase 95-125V-AC, 60 Hz motor with thermally protected class A temperature rating.

.6 Gear box: Satellite gears with 3 levels for load distribution with planetary type gears machined to close tolerance of tempered steel.

.7 Controls: Motors will be operated by white three position rocker switch, located remotely.

.8 Exterior Hembar: Extruded aluminum in clear anodized finish with plastic end finials.

.9 Dynamic Hembar: At sill locations, in lieu of bottom channel, provide aluminum Dynamic Hembar with same finish as side channels. Upon contact with sill, it shall provide a light seal even if the sill is slightly out of level.

.10 Colour: Exposed surfaces (excluding fabric) shall be colour selected by Consultant, and not necessarily from manufacturer's full colour range. Metal components shall be pretreated and finished with an acceptable baked enamel finish.

.11 Fasteners: Non-corrosive metal screws for attachment to windows or curtain wall framing, concealed in completed installation.

.12 Shade and mounting system to be designed to allow air between shade and glass.

.13 Fabric shall hang flat, without buckling or distortion. Trimmed edges shall hang straight without curling or raveling.

.14 Unguided vertical shades shall not drift sideways more than 3 mm in total run.

.15 Provide stops at highest and lowest shade positions to prevent over winding and unrolling.

.26 Design and fabricate shades so that there is a maximum 12 mm gap both sides of fabric.

3.4 CLEAN UP

.1 At conclusion of work remove all debris, dirt; clean surfaces like glass, floor, stools, heating units if soiled. Test each re-installed drape, each sunshade numerous times and make adjustments to assure trouble-free installation and operation.

.2 Brief maintenance staff regarding proper care, cleaning, lubricating, adjusting, etc.

END OF SECTION

Part 1 General

1.1 DRAWINGS

.1 AD 534 & 539 Drapery Details

1.2 SUBMITTALS

.1 Shop Drawings: Submit shop drawings for Consultant's review, in accordance with Section 01 33 00.

.2 Samples: Submit samples of fabric for Consultant's approval, in accordance with Section 01 33 00.

.3 Maintenance Data and Operating Instructions: Provide maintenance and operating instructions for incorporation into maintenance manual in accordance with Section 01 78 10.

.4 Test Reports

.1 Submit test reports to the Consultant confirming that fabric conforms to flame resistance as listed in these Specifications.

.2 Submit test reports from an independent laboratory confirming that the stage curtain meets the flame spread ratings specified.

.5 Engineer's Certificate:

.1 Submit certificate from Professional Engineer registered in the Province of Ontario stating the strength of the suspension system of the curtain track at stage, gym and forum as mounted to the structural steel provided.

.6 Suppliers / Installers:

JOEL Theatrical Rigging Contractors Ltd.
365 Watline Avenue
Mississauga, ON
L4Z 1P3
Contact: Van Marineau
(905) 890-8802

Ontario Staging Limited
78 Mack Street
Toronto, ON
M1L 1M9
Contact: Tony Physenzou
(416) 694-8980

Scenework
67 Watson Rd. S. Unit 7
Guelph, ON
N1L 1E3
Contact: Ron Foley
(519) 837-0583

Jack A. Frost Limited
3245 Wharton Way
Mississauga, ON
L4X 2R9
Contact: Craig Blackley
(905) 624-5344

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Part 2 Products

2.1 MAIN DRAPE TRACK

.1 The main drape Track shall be:

.1 Two (2) lengths of H&H Specialties Inc. #110A, 6063-T5 extruded aluminum, or similar

.2 Lengths allow for 600mm track overlap at proscenium centre.

.3 Hand line position shall be determined

.4 One (1) H & H Specialties Inc. #103 Double End Pulley.

.5 One (1) H & H Specialties Inc. # 104 Single End Pulley.

.6 Two (2) H & H Specialties Inc. # 105 Overlap Clamp

.7 Two (2) H & H Specialties Inc. #109 End Stop and Cord Support.

.8 H & H Specialties Inc., #106 Clamp Hanger, as required: please refer to beam clamp description below.

.9 H & H Specialties Inc., #126 Centre Support Hanger: please refer to beam clamp descriptions below.

.10 One (1) H & H Specialties Inc., #108 Floor Block with #108DK Detachable Floor Block Kit, complete with attachment hardware:

.11 Hand line position shall be determined on site.

.12 H & H Specialties Inc., #114 Operating Line, as required.

.13 Two (2) H & H Specialties Inc., #102 Master Carriers.

.14 H & H Specialties Inc., #101 Single Carrier, one (1) per grommet.

.15 Install the main drape panels on track carriers using Turner & Seymour #105 Special s-hooks to attach each grommet.

2.2 TRAVELLER TRACK

.1 The main drape rigging shall consist of:

.1 Brackets: There shall be:

.1 Seven (7) rigging points securing the track to the bottom cords of the open web steel joists.

.2 Required quantities of rigging points securing the track to the rigging support members.

.2 Track: there shall be:

.1 Two (2) lengths of H & H Specialties Inc. #310A, 6063-T5 extruded aluminum, or similar.

.2 Lengths allow for 600mm track overlap at proscenium centre.

.3 Hand line position shall be determined on site.

.4 Two (2) H & H specialties Inc., #309 End Stop.

.5 H & H Specialties Inc., #301 single Carrier, one (1) per 300 mm of track plus one (1).

.6 Install the traveler drape panels on track carriers using Turner & Seymour #105 Special s-hooks to attach each grommet.

□

.7 Provide two (2) H & H Specialties Inc. #342 Walk Along Master Carriers.

2.3 PANELS

.1 All fabric, including jute webbing, shall meet the requirements for a high degree of flame resistance, as described in NOTE 4 of CAN 2-4M77: "TEXTILE TEST METHODS". Method 27.

.2 A certificate confirming compliance with the above standard shall be shipped with all drapery panels"
- One (1) additional copy of the certificate must be forwarded to the Consultant by mail or fax.
- The following information must be displayed on the certificate:
(a) Project Name.
(b) Date of Certificate Issue.
(c) Material Used.
(d) Material Colour
(e) Fabrication Date.

2.4 VALANCE AND MAIN DRAPE AS MANUFACTURED BY:

.1 JB Martin Ltd. (21 oz.Concertino)

.2 JL DeBall (21 oz. Sydney)

2.5 UPSCALE MASKING AS MANUFACTURED BY:

.1 Melfabco

.2 Fred Krieger & Co. Inc.

2.6 PANELS

.1 Approximate dimensional information is noted throughout this specification and on associated drawings, but, it is the responsibility of the Contractor to confirm exact measurements in accordance with the intent of this specification.

.2 Panels showing blemishes, puckers or any irregularity will not be accepted.

.3 Each panel shall have six (6) 40mm wide x 130mm long flame test swatches sewn to an offstage, bottom corner.
- The swatches shall be made from the same fabric used to construct the drape
These fabric swatches shall be used for flame testing purposes.

.4 Provide on each panel a sewn-on label which clearly states:
- Manufacturer's Name
- Material Used.
- Material Colour.
- Fabrication Date.

□

- Flame Resistance Compliance.
- Finished Panel Size.
- This information label shall be sewn next to the flame test swatches.

2.7 MAIN DRAPE PANELS

.1 Each panel shall be fabricated as follows:

.1 21 oz. velour
.2 single backed
.3 100% cotton
.4 Concertino 2603
.5 or similar.

.2 Colour to be determined; please provide fabric samples for selection.

.3 Sewn with 50% fullness.

.4 Minimum 100 mm flame-resistant jute webbing sewn across the top.

.5 #6 brass grommets installed 25 mm in from each end with additional grommets equally spaced on maximum 305 mm centres.

.6 Minimum 150 mm offstage hems with 50 mm turnbacks.

.7 Minimum 300 mm onstage hems with 76 mm turnbacks.

.8 Minimum 300 mm bottom hem with 76 mm turnunder.

.9 Special Turner & Seymour #105 s-hooks to attach each grommet to a carrier.

2.8 MISCELLANEOUS HARDWARE

.1 Eye Bolts

.1 Shoulder type, ½", forged eyebolts, Crosby S-279 or equal.

.2 Turnbuckles

.1 Jaw & eye turnbuckles, 5/16", forged, Crosby HG-227 or equal.

.3 Compressions Sleeves

.1 Crosby "Cold TuffTM" Sleeve, or Nicopress copper, use recommended turn back and manufacturer's grip verification methods.

.4 Shackles

.1 Anchor shackles, bolt type, 5/16", Crosby G-2130 or equal.
.2 Any equals must be pre-approved by the Owner or Consultant before use.

.5 Channel

.1 Channel, 1 5/8" x 1 5/8", structural channel, Unistrut P1000 or equal.

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.2 Flat plate fitting, 1 5/8" x 1 5/8", Unistrut P1045 or equal.

.3 Spring nuts, Unistrut P1010 or equal.

.4 Remove all burrs and break sharp edges.

.6 Cable Cradle

.1 Manufacturer, Altman Lighting

.2 Part Number, Altman 512, ¾" to 1 ¼" or

.7 Drapery Trim Chain

.1 Description. No. 8 Jack Chain

.2 Length, 12".

.3 Quantity, one (1) per grommet on main drape.

.8 Main Drape Operating Line

.1 (a) Manual

.1 Description, 3/8" black cord

.2 Length, as required

.2 (b) Winch

.1 Description, 1/8" galvanized aircraft cable

.2 Length, as required.

.9 Steel Pipe

.1 Schedule 40 steel pipe, diameters as noted.

.2 Remove all burrs and break sharp edges

.10 Unistrut Spring Nuts.

.1 Hex nuts and bolts, SAE Grade 3 typical

.2 13 UNC threaded rod (remove burrs and sharp edges).

.11 Washers and Flat Plates

.1 ANSI standard plain and helical spring lock washers.

.2 Unistrut Flat Plate fittings.

.12 Beam Clamps

.1 Unistrut clamp assemblies as noted.

.13 Batten Clamps

.1 H&H Specialties Inc., styles as noted.

.2 Alvin or Kee clamps, styles as noted.

.14 Wire Rope

.1 Galvanized 7 x 19, diameter as noted, use recommended turn back.

.15 Thimble

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.1 Wire rope thimbles, ¼", hot dip galvanized steel, Crosby G-411 or or equal.

.16 Other

.1 Additional hardware, components and responsibilities may be described in this Section, on drawings and in SECTION 3: INSTALLATION.

Part 3 Execution

3.1 GENERAL CONDITIONS

.1 Approximate dimensional information is as noted throughout this Specification and on associated drawings, but is the responsibility of the Contractor to exact dimensions, quantities of hardware and final placement of equipment in accordance with the intent of this Specification.

.2 Tighten all hardware to manufacturer's specifications.

.3 Use hardware only for its designed purpose.

.4 Install all equipment generally as described by this documentation, as required by codes, and as intended by the manufacturers.

.5 Install all pipes, track and channel parallel to the stage floor.

.6 Report unforeseen or unsafe conditions to the Owner or the Consultant immediately.

.7 The position of installed electrical and mechanical equipment shall take precedence during installation.

.8 Inform the Consultant prior to adjusting any rigging positions.

.9 All positions shall be finally determined on site.

3.2 INSTALLATION OF DRAPERY

.1 The Contractor will install the drapery panels.

.2 The drapery will be installed as soon as possible after the completion of the rigging installation.

.3 Report unforeseen or unsafe conditions immediately.

.4 Use trim chain with s-hooks on carriers as required.

.5 Drapery panels, when installed, shall hang between 5mm and 25mm from the stage floor when in playing position.

.6 This project involves installation as part of new construction.

.7 All dimensions shall be finally determined by site conditions.

3.3 DIMENSIONS

.1 Based on drawings. Exact dimensions to be confirmed on site.

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3.4 DEMONSTRATION AND TRAINING

.1 Provide demonstration of operation to the Owner and his representatives.

.2 Provide training or maintenance and repairs to the Stage Rigging and Drapery.

3.5 ENGINEERING CERTIFICATION

.1 Submit as part of Shop Drawings:

.1 Written certification bearing the seal of a Professional Engineer registered in the Province of Ontario, confirming that the connection strengths of the rigging system to the building structure. State that such design has been reviewed to withstand load conditions as may be imposed by the dead and live loads of both the equipment and persons using this equipment.

END OF SECTION

□

Part 1 General

1.1 DESCRIPTION

.1 Provide seismic restraint in accordance with the requirements of this section in order to maintain the integrity of nonstructural components of the building so that they remain safe and functional in case of seismic event.

.2 Scope: Refer to structural drawing S-1 for a table of non-structural mechanical and electrical building components subject to seismic design.

.3 Individual specification sections are responsible, including Division 15 & 16, for compliance with seismic requirements. Refer to mechanical and electrical sections.

1.2 RELATED WORK

.1	Submittal Procedures	Section 01 33 00
.2	Cast In Place Concrete	Section 03 30 53
.3	Precast Concrete Hollow Core Planks	Section 03 41 13
.4	Structural Load Bearing CMU Construction	Section 04 22 01
.5	Structural Steel and Open Web Steel Joist Framing	Section 05 21 19
.6	Steel Roof Decking	Section 05 31 23
.7	Metal Fabrications	Section 05 50 00
.8	Mechanical	Divisions 21 - 25
.9	Electrical	Divisions 26 - 28

1.3 QUALITY CONTROL

.1 Shop Drawing Preparation:

.1 Have seismic-force-restraint shop drawings and calculations prepared and sealed by a professional structural engineer licensed in the Province of Ontario, experienced in the area of seismic force restraints.

.2 Submit seismic data to meet the force requirements specified for all materials and products used in the vertical or lateral restraint connections related to each building component.

.2 Coordination:

.1 Do not install seismic restraints until seismic restraint submittals are approved by the Consultant.

.2 As part of interference drawings and scheduling, coordinate all seismic hangers and braces with the installation sequence, required clearances and dimensions for each component to not interfere with other building components or systems, etc.

1.4 SUBMITTALS

.1 Submit a coordinated set of equipment anchorage drawings prior to installation including:

.1 Description, layout, and location of items to be anchored or braced with anchorage or brace points noted and dimensioned.

.2 Details of anchorage or bracing at large scale with all members, parts brackets shown, together with all connections, bolts, welds etc. clearly identified and specified.

.3 Numerical value of design seismic brace loads.

.4 For expansion bolts, include design load and capacity if different from those specified.

.2 Submit prior to installation, a coordinated set of bracing drawings for seismic protection of piping, with data identifying the various support-to-structure connections and seismic bracing structural connections, include:

.1 Single-line piping diagrams on a floor-by-floor basis. Show all suspended piping for a given floor on the same plain.

.2 Type of pipe (Copper, steel, cast iron, insulated, non-insulated, etc.).

.3 Pipe contents.

.4 Structural framing.

.5 Location of all gravity load pipe supports and spacing requirements.

.6 Numerical value of gravity load reactions.

.7 Location of all seismic bracing.

.8 Numerical value of applied seismic brace loads.

.9 Type of connection (Vertical support, vertical support with seismic brace etc.).

.10 Seismic brace reaction type (tension or compression). Details illustrating all support and bracing components, methods of connections, and specific anchors to be used.

.3 Submit prior to installation, bracing drawings for seismic protection of suspended ductwork and suspended electrical and communication cables, include:

.1 Details illustrating all support and bracing components, methods of connection, and specific anchors to be used.

.2 Numerical value of applied gravity and seismic loads and seismic loads acting on support and bracing components.

.3 Maximum spacing of hangers and bracing.

.4 Seal of registered structural engineer responsible for design.

.4 Submit design calculations prepared and sealed by the registered structural engineer specified above in paragraph 1.3.1.

Part 2 Products

2.1 Refer to list of components on Seismic design Table on Drawing S-1

Part 3 Execution

3.1 EQUIPMENT RESTRAINT AND BRACING:

.1 Provide equipment supports and anchoring devices to withstand the seismic design forces, so that when seismic design forces are applied, the equipment cannot displace, overturn, or become inoperable.

.2 Provide anchorages in conformance with recommendations of the equipment manufacturer and as shown on approved shop drawings and calculations.

.3 Construct seismic restraints and anchorage to allow for thermal expansion.

END OF SECTION

Part 1 General

1.1 RELATED SECTIONS

.1 Section 01 11 00 – Summary of Work: Protection of openings; temporary power and lighting.

.2 Section 01 52 00 – Construction Facilities: Protection of openings; temporary power and lighting.

.3 Section 03 30 00 - Cast-in-Place Concrete: Elevator pit, elevator motor and pump foundation, and grouting thresholds

.4 Section 05 50 00 - Metal Fabrications: Divider beams, support for entrances and rails, hoisting beam at top of hoistway.

.5 Section 04 21 13 – Masonry: Masonry hoistway enclosure, building-in and grouting hoistway door frames, grouting thresholds.

.6 Section 05 50 00 – Metal Fabrications: Divider beams, support for entrances and rails, hoisting beam at top of hoistway.

.7 Division 26: Electrical service to main disconnect in elevator machine room; machine room; machine room and pit receptacles with ground-fault current protection; lighting in machine room and pit; wiring for telephone service to machine room, cab telephone wiring.

1.2 REFERENCES

.1 ADAAG, Americans with Disabilities Act Accessibility Guidelines.

.2 ANSI/NFPA 70, National Electrical Code.

.3 ANSI/NFPA 80, Fire Doors and Windows.

.4 ANSI/UL 10B, Fire Tests of Door Assemblies.

.5 CAN/CSA C22.1, Canadian Electrical Code.

.6 CAN/CSA-B44, Safety Code for Elevators and Escalators.

.7 Model Building Codes.

.8 Ontario Building Code and all other local applicable codes.

.9 American National Standards Institute (ANSI)

.1 ANSI/NEMA MG1-[1993], Motors and Generators.

.10 Canadian Standards Association (CSA)

.1 CAN/CSA-B44-[M94], Safety Code for Elevators.

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.2 CAN/CSA-B651-[95], Barrier-Free Design - Public Safety.

.11 National Building Code (NBC)

1.3 SYSTEM DESCRIPTION

.1 ELEVATOR

1. Roped Hydraulic
2. Rated Load: 635 Kg.
3. Rated Speed: 0.15 m/s
4. Car Inside Dimensions:
   1. 1067 mm wide x 1524 mm deep
5. Hoistway Size: Refer to Architectural Drawings
   Operation: Automatic
6. Car Controls Illuminated Type with faceplate in Stainless Steel #4 finish.
7. Hall Call Stations: Illuminated type. Stainless steel #4 finish.
8. Hoistway Entrances Size: 914 mm wide by 2032 mm high
9. Hoistway Entrance Type: Two Speed Sliding (Left or Right)
10. Door Operations: Automatic door operator for hoistway and car
11. Travel: Refer to Architectural Drawings (Maximum 9 metres)
12. Stops: Refer to Architectural Drawings (3 levels – two floors + stage)
13. Openings: Refer to Architectural Drawings
14. Power Supply: Select one (220/1/60 or 208/3/60, 30Amp)
15. Lighting Supply: 120 Volts, 60 Hertz., 15 Amp (separate circuit)
16. Elevator must comply with CAN CSA-B44, “Safety Code for Elevators”, Section 5.2, (Latest Version Including Supplements) in force at the time of inspection.

1.4 SUBMITTALS

.1 Product Data: Submit manufacturer's printed product literature, specifications and data sheet in accordance with Section 01 33 00 - Submittal Procedures.

.1 Signal and operating fixtures, operating panels and indicators.

.2 Cab design, dimensions and layout.

.3 Hoistway-door and frame details.

.4 Electrical characteristics and connection requirements.

.5 Expected heat dissipation of elevator equipment in machine room (BTU).

.2 Shop Drawings: Submit in accordance with Section 01 33 00 - Submittal Procedures.

.1 Submit shop drawings to indicate project layout, including details and the following information:

.1 Car, guide rails, buffers and other components in hoistway.

.2 Maximum rail bracket spacing.

.3 Maximum loads imposed on guide rails requiring load transfer to building structure.

.4 Loads on hoisting beams.

□

.5 Clearances and travel of car.

.6 Clear inside hoistway and pit dimensions.

.7 Location and sizes of access doors, hoistway entrances and frames.

.2 Operation and Maintenance Data

.1 Provide 4 copies manufacturer's standard operations and maintenance manual.

1.5 QUALITY ASSURANCE

.1 Manufacturer: Provide elevators manufactured by a firm with a minimum of 10 years experience in fabrication of elevators equivalent to those specified.

.2 Installer: By manufacturer or authorized distributor or installer approved by manufacturer, provided a letter of authorization by lift manufacturer is submitted to the consultant prior to shop drawings.

.3 Regulatory Requirements: Elevator system design and installation shall comply with the latest versions of CAN/CSA-B44 -00.

.1 Elevator shall be designed to meet to Americans with Disabilities Act Accessibility Guidelines (ADAAG)

.4 Permits and Inspections: Provide licenses and permits and perform required inspections and tests.

1.6 DELIVERY, STORAGE AND HANDLING

.1 Manufacturer shall issue delivery schedule within 7 days of issuance of purchase order. Manufacturer shall maintain regular contact with the contractor and Consultant regarding expediting shop drawings and delivery.

.2 At least 3 weeks in advance of delivery, manufacturer’s representative shall visit the site to discuss site preparedness. Manufacturer’s rep. shall make a second visit one week in advance of the delivery and again liaise with General Contractor and Consultant to ensure site preparation.

1.7 WASTE MANAGEMENT AND DISPOSAL

.1 Deposit packaging materials in appropriate container on site for recycling or reuse.

.2 Avoid using landfill waste disposal procedures when recycling facilities are available.

.3 Collect and separate plastic, paper packaging and corrugated cardboard.

.4 Dispose of corrugated cardboard, polystyrene and plastic packaging material in appropriate on-site bin.

1.8 WARRANTY

.1 The elevator warranty shall cover defective functionality, programming, materials and workmanship for a period of Three Years from the date of Substantial Completion of the

contract. The guarantee includes ordinary wear but excludes improper use, vandalism, abuse, and misuse by the Board.

.2 Project Warranty: Refer to CCDC 2 for project warranty provisions.

1.9 MAINTENANCE SERVICE

.1 Included in the Tender price is the maintenance service consisting of regular examinations, adjustments and lubrication of the elevator equipment shall be provided by the elevator contractor for a period of one (1) year after the elevator has been turned over for the customer's use. This service shall not be subcontracted but shall be performed by the elevator contractor. All work shall be performed by competent employees during regular working hours of regular working days and shall include emergency 24-hour callback service. This service shall not cover adjustments, repairs or replacement of parts due to negligence, misuse, abuse or accidents caused by persons other than the elevator contractor. Only genuine parts and supplies as used in the manufacture and installation of the original equipment shall be provided.

Part 2 Products

2.1 MATERIALS

.1 Materials: As required to achieve specified performance criteria; functionally compatible with adjacent materials and components.

2.2 ACCEPTABLE MANUFACTURERS

.1 This specification is based on a LULA, Model LU4260R manufactured by Delta Elevator Company Ltd.

.2 Provide double sided elevator (doors on both sides) for access to Stage.

.3 Acceptable Alternates: Elevators meeting or exceeding these base specifications by:

- .1 Federal Elevator Systems Inc.
- .2 Garaventa
- .3 Savaria
- .4 Southwestern Elevators
- .5 Delta Elevator

2.3 CAR CAB SPECIFICATIONS

.1 Shell Enclosure:

1. Car Top 14 ga. (l.9mm) steel
2. Shell Walls 16 ga. (l.52mm) steel
3. Strike Column 16 ga. (l.52mm) Stainless Steel # 4
4. Fascia 16 ga. (l.52mm) Stainless Steel # 4, full width, straight type.

.2 Architectural Features:

1. Side Walls: Plastic Laminate - raised panels
2. Front Return: Stainless Steel # 4 finish

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3. Car Door: Stainless Steel # 4
4. Base: Stainless Steel # 4
5. Reveals: Stainless Steel # 4
6. Floor: to be porcelain tile, installed by flooring contractor.
7. Ceiling: White enamel steel ceiling
8. Hoistway Doors and Frames: Stainless Steel # 4

.3 Supplementary Features:

1. Lighting: Fluorescent Down lights
2. Car sill(s): Extruded Aluminium.
3. Overall Height 2134mm (2134mm clear inside)
4. Car Operating Panel: Panel arrangement to conform to latest version of B44 Appendix E
5. Handrail; 6mm x 63mm flat handrail Stainless Steel #4 finish Located on control wall (handrails on other non-entrance walls optional)
6. Pad Hooks
7. Battery Emergency Power for lowering of elevator and door opening.
8. Emergency Car Lighting: An emergency power unit employing a sealed rechargeable battery and totally static circuits shall be provided that shall illuminate the elevator car.
9. Emergency Communication: Hands-free automatic dialing telephone shall be furnished and installed as part of the car station. A separate phone line to the elevator controller shall be provided and located in the elevator machine room under another section of the specifications.
10. Labels: Entrances shall be manufactured in accordance with procedures established by Under-Writers laboratories and shall be so labelled.
11. Sight Guards Sight guards shall be furnished on the leading edge of the doors to conceal the hoistway beyond the doors. Finish to match door panels.
12. Car Floor Indicator: One (1) digital dot matrix alphanumeric display to be installed in each car as part of the car station.
13. Car Arrival Chime
14. Braille plates on car station.
15. Certificate Frame
16. Car directional lantern: Located in the strike post of each car door.
17. Independent service operation.

2.4 ROPED HYDRAULIC SYSTEM

1. Safety: An instantaneous safety shall be provided which will be actuated by a friction governor or slack ropes. The instantaneous safety shall be automatic and reset by running the car in the up direction.

2. Governor: The governor shall be located in the hoist way overhead. The governor shall include an electrically activated means of manually tripping the governor from the machine room for annual no-load and five-year full-load safety tests. The design shall not require a governor access door.

3. Plunger and Cylinder: The cylinder shall be constructed of steel pipe of sufficient thickness

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and suitable for the operating pressure. The top of the cylinder shall be equipped with a cylinder head with a drip ring to collect any oil seepage as well as an internal guide ring and self-adjusting packing. The plunger shall be constructed of selected steel tubing or pipe of proper diameter machined true and smooth with a fine polished finish. The plunger shall be provided with a stop ring electrically welded to prevent the plunger from leaving the cylinder. The plunger and cylinder shall be installed plumb and shall operate freely with minimum friction.

4. Ropes: minimum (2) 9.5mm aircraft cable

5. Sheave Carriage: Sheave carriage to be guided along elevator rails. Sheave to be of metal construction and of diameter to suit wire ropes.

.6 **Pumping Unit**

The pumping unit shall be of integral design and shall include a submersible electric motor connected to a pump, a hydraulic control system, a storage tank, necessary piping connections, and a controller, all compactly designed as a single self-contained unit. The motor and pump assembly shall be mounted on a rubber isolated inner base.

.7 **Pump**

The pump shall be a positive displacement screw type to give smooth operation and shall be especially designed and manufactured for elevator service.

.8 **Motor**

The motor shall be of alternating current, submersible design for quiet operation.

.9 **Control Valve**

1. The hydraulic control system shall be of compact design suitable for operation under the required pressures.

2. The manual lowering feature shall permit lowering the elevator at slow speed in the event of power failure.

2.5 STORAGE TANK

.1 The storage tank shall be constructed of steel, and shall be provided with a cover, a filter screen mounted over the suction inlet. Tank design shall incorporate a reserve capacity. An initial supply of oil sufficient for proper operation shall be provided.

2.6 PIPING

.1 Pipe and/or hose as permitted by code of adequate size and thickness shall be installed between the pumping unit and the cylinder head. A shut off valve shall be provided for maintenance and adjusting purposes.

2.7 CONTROLLER

.1 A microprocessor controller shall be provided. Include necessary starting switches of adequate size together with all relays, switches and hardware required to accomplish the operation specified. Overload protection shall be provided to protect the motor against overloading.

2.8 CAR STALL PROTECTIVE CIRCUIT

.1 A protective circuit shall be provided which will stop the motor and the pump and return the car to its lowest landing in the event the car does not reach its designed landing with a

predetermined time interval. This circuit will permit a normal exit from the car but prevent further operation of the elevator until the trouble has been corrected.

2.9 WIRING

.1 All wiring and electrical interconnections shall comply with the governing codes.

2.10 LEVELLING DEVICE

.1 The elevator shall be provided with an automatic levelling device, which will bring the car to a stop within 6mm (1/4") of the landing level regardless of load or direction of travel. Landing level will be maintained within the levelling zone irrespective of the hoistway doors being open or closed.

2.11 HOISTWAY OPERATING DEVICES

.1 All required Hoistway operating switches to be provided.

2.12 PIT SWITCH

.1 An emergency stop switch shall be located in the pit.

.2 **Pit Maintenance Stand**

.1 Provide a non-removable means to mechanically hold the car above the pit floor to provide an area in the pit for maintenance and inspection as per requirements of B44

2.13 PLATFORM

.1 The car platform shall have a fabricated frame of formed or structural steel shapes. Sub-flooring shall be wood. The underside of the platform will be fireproofed. The platform shall be manufactured by a CWB certified shop and be equipped with an aluminum sill.

2.14 CAR FRAME

.1 A suitable car frame fabricated from formed or structural steel members shall be provided with adequate bracing to support the platform and car enclosure. Guides to be mounted on top and bottom of the car frame to engage the guide rails.

2.15 RAILS

.1 Steel elevator guide rails shall be furnished to guide the car, erected plumb and securely fastened to the building structure.

2.16 DOOR OPERATION

.1 Doors on the car and at the hoistway entrances shall be power operated by means of an operator mounted on top of the car. The motor shall have positive control over the door movement for smooth operation.

.2 The car door shall have an infra-red detector to cause the doors to re-open should an obstruction be detected during the closing cycle.

.3 Door operation shall be automatic at each landing with door opening being initiated as the car arrives at the landing and closing taking place after expiration of a time interval. A car door electric contact shall prevent starting the elevator away from the landing unless the car door is in its closed position.

.4 An approved positive interlock shall be provided for each hoistway entrance, which shall prevent operation of the hydraulic unit unless all doors for that elevator are

closed and shall maintain the doors in their closed position while the elevator is away from the landing. Provide emergency access to the hoistway as required by governing codes.

2.17 HOISTWAY DOORS

.1 The elevator contractor shall install at each landing served, a hoistway entrance of the type and size as previously described. Each entrance shall consist of flush hollow metal doors with integral hanger assembly, frames assembled for one piece unit installation, extruded aluminum sill, fascia, toe guard, hanger cover, header, hanger track assembly, and formed structural strut supports.

.2 Provide equipment according to Seismic zone: zone 0

.3 Design and construct elevator in accordance with CAN/CSA-B44, local codes and regulations.

Part 3 Execution

3.1 MANUFACTURERS INSTRUCTIONS

.1 Compliance: Comply with manufacturers written data, including product technical bulletins, product catalog installation instructions, product carton installation instructions, and data sheet.

3.2 PREPARARTION

.1 Take field dimensions and examine conditions of substrates, supports, and other conditions under which this work is to be performed. Do not proceed with work until unsatisfactory conditions are corrected.

3.3 INSTALLATION

.1 Installation of all elevator components except as specifically provided for elsewhere by others.

3.4 SITE TESTS

.1 Perform and meet tests required by CAN/CSA-B44.

.2 Supply instruments and execute specific tests.

.3 Furnish test and approval certificates issued by jurisdictional authorities.

3.5 CLEANING

.1 Remove protective coverings from finished surfaces and components.

.2 Clean surfaces and components ready for inspection.

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3.6 ADJUSTMENTS

.1 The elevator contractor shall make a final check of each elevator operation with the Board or Board's representative present prior to turning each elevator over for use. The elevator contractor shall determine that control systems and operating devices are functioning properly.

.2 Adjust door opening and closing times to suit handicapped users in accordance with Engineer's instructions.

.3 Adjust control system to cause elevators to answer hall calls during working day within performance criteria specified.

.4 Adjust for smooth acceleration and deceleration of car as so not to cause passenger discomfort.

.5 Adjust automatic floor levelling feature at each floor.

END OF SECTION

□

Part 1 General

1.1 GEOTECHNICAL INVESTIGATION

.1 A copy of the following reports from investigations of the Site are enclosed in Binder C.

PROJECT NAME: **Geotechnical Investigation**
Proposed North Oakville #3 Catholic School
Oakville, Ontario
Prepared by: Forward Engineering & Associates Ltd.
Project No. : G7565
Date: January 27, 2026

Soil Chemical Testing Report
North Oakville #3 Catholic Elementary School
Post Road and Settlers Road East
Oakville, Ontario
Prepared by: Forward Engineering & Associates Ltd.
Project No. : 7565
Date: December 8, 2025

DISCLAIMER

.1 The Geotechnical Report is not part of the Contract Documents prepared by the Architect or his sub consultants. It is bound into the Specifications set for convenient reference only. The Geotechnical report was not prepared by or under the supervision of the Architect. While every effort has been made to attempt to provide comprehensive geotechnical information for the purposes of design and tendering, the Architect claims no responsibility for the accuracy of the information contained in the report.

.2 Refer to Section 00 21 13 – 'Instruction to Bidders', article 1.24-Examination of the Site.

1.2 CAUTIONARY NOTE REGARDING SITE FILL

.1 The investigation referenced above took place after the site was filled by the subivision developer.

Part 2 Products

2.1 NOT USED

.1 Not used.

Part 3 Execution

3.1 NOT USED

.1 Not used.

END OF SECTION

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Part 1 General

1.1 RELATED WORK

.1 Site Grading — Section 31 23 13

.2 Excavating, Trenching and Backfilling — Section 31 23 10

1.2 SCOPE and PREVIOUS FILL BY DEVELOPER

.1 Refer to drawings and other sections regarding extent of previous grading completed by the subdivision developer.

1.3 EXAMINATION

.1 Examine the Drawings, Specifications, and Bore Hole data which show soil conditions at boreholes after site was filled and pre-graded by the sub-division Developer. Visit the site and determine the work extent and nature of the existing conditions. In no circumstances will any claims against the Owner be allowed resulting from failure to ascertain the work herein described or implied.

.2 Report to the Consultant in writing any conditions which will prejudice the proper completion of the work of this Section. Commencement of work constitutes acceptance of existing conditions.

1.4 BURIED SERVICES

.1 Before commencing work confirm no buried services remain on the site and locate all services adjacent to the site. Engage private locate firm for underground scan for all areas of work outside the property lines.

.2 Arrange with appropriate authority for relocation of buried services that interfere with execution of work. Pay costs of relocating services.

1.5 PROTECTION

.1 Establish locations of all electrical, telephone, or other service installations existing in the areas of site preparation by contacting the service owners and obtaining their approval to work in such areas. Contact the Municipality, the Region of Halton and local utilities to review proposed scheduling, work activities and regulations pertaining to all work beyond the limits of the property including but not limited to parking areas, storm water outlet and headwall and asphalt driveway entrances. Provide adequate markers or take protective measures to ensure that no damage will be caused under this Section. Repair or replace damaged work as required without cost to the Owner.

.2 Electronically locate, map and record location of services prior to doing any excavation.

1.6 DUST CONTROL

.1 Provide and maintain to the Consultant's satisfaction, adequate system to avoid any nuisance caused by dust and dirt rising throughout the area of operations.

1.7 SILT CONTROL

.1 Provide and maintain to the Consultant's and to the Authorities' satisfaction, control systems to prevent silt from entering any storm drainage system.

Part 2 Products

2.1 NOT APPLICABLE

Part 3 Execution

3.1 DISPOSAL OF WASTE AND SURPLUS MATERIALS

.1 Except where specified or indicated on Drawings to be retained on site, or to be reused, remove from the site, all waste and surplus materials resulting from site preparation work on a daily basis. Dispose of as required in accordance with local or provincial regulations. Under no circumstances shall the burning of rubbish be permitted on the site. Where items are to be reused, store on site where designated and provide temporary protection to same to prevent damage by construction operations.

END OF SECTION

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Part 1 General

1.1 GENERAL REQUIREMENTS

.1 Read and be governed by conditions of the Contract and sections of Division 1.

1.2 SITE CONDITIONS

.1 Known underground and surface utility lines and buried objects are indicated on site plan. Underground utility lines or other buried objects not shown on site plan are the responsibility of the Contractor and must be established in location and depth before commencing work.

1.3 PROTECTION

.1 Prevent damage to trees, landscaping, natural features, benchmarks, surface or underground utility lines, which are to remain. Make good any damage.

Part 2 Products

2.1 MATERIALS

.1 Obtain approval of excavated or graded material used in fill for grading work. Protect approved material from contamination.

Part 3 Execution

3.1 GRADING

.1 Rough grade to levels, profiles, and contours allowing for surface treatment as indicated.

.2 Rough grade to depths below finish grades as required to install pavements and landscape treatments. Refer to details for required depths.

.3 Slope rough grade away from building 1:50 minimum.

.4 Prior to placing fill over existing ground, scarify surface to depth of 150mm. Fill all depressions, etc., with approved fill. Maintain fill and existing surface at approximately same moisture content to facilitate bonding.

.5 Compact filled and disturbed areas to corrected minimum dry density/maximum dry density to ASTM D698-00, Standard Proctor, method C/D, as follows:

.1 90% under soft landscaped areas

.2 98% under paved and walkway areas

.6 Do not disturb soil within branch spread of trees or shrubs to remain.

3.2 TESTING

.1 Inspection and testing of soil compaction will be carried out by designated testing laboratory.

3.3 SURPLUS MATERIAL

.1 Remove surplus material from site as directed by Consultant and in accordance with all municipal with provincial regulations.

.2 Remove material unsuitable for fill, grading or landscaping from site.

END OF SECTION

Part 1 General

1.1 RELATED SECTIONS

.1 Section 01 33 00 - Submittal Procedures.

.2 Section 01 56 00 - Temporary Barriers and Enclosures.

.3 Section 01 35 43 - Environmental Procedures.

.4 Section 31 22 00 - Landscape Grading

.5 Section 31 23 13 - Rough Grading

.6 Section 31 25 00 - Erosion and Sedimentation Control

.7 Section 32 91 21 – Top soil and Finish Grading.

.8 Section 31 05 17 - Aggregate Materials.

.9 Section 32 12 16 – Asphalt Paving.

.10 Section 32 91 19 - Topsoil and Finish Grading

.11 Section 33 46 20 – Foundation and Underslab Drainage.

1.2 REQUIREMENTS OF REGULATORY AGENCIES

.1 Work of this Section shall include protection measures, consisting of materials, constructions, and methods required by the Occupational Health and Safety Act, 1987, of the Province of Ontario, and as otherwise imposed by Jurisdictional Authorities to save persons and property from harm.

.2 Submit shop drawings required by authorities.

1.3 REFERENCES

.1 American Society for Testing and Materials (ASTM)

.1 ASTM C117-95, Standard Test Method for Material Finer Than 0.075 mm (No.200) Sieve in Mineral Aggregates by Washing.

.2 ASTM C136-96a, Standard Test Method for Sieve Analysis of Fine and Coarse Aggregates.

.3 ASTM D422-98, Standard Test Method for Particle-Size Analysis of Soils.

.4 ASTM D698-00a, Standard Test Methods for Laboratory Compaction Characteristics of Soil Using Standard Effort (12,400 ft-lbf/ft ^{3}) (600 kN-m/m ^{3}).

.5 ASTM D1557-00, Test Method for Laboratory Compaction Characteristics of Soil Using Modified Effort (56,000 ft-lbf/ft ^{3}) (2,700 kN-m/m ^{3}).

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.6 ASTM D4318-00, Standard Test Methods for Liquid Limit, Plastic Limit, and Plasticity Index of Soils.

.2 Canadian General Standards Board (CGSB)

.1 CAN/CGSB-8.1-88, Sieves, Testing, Woven Wire, Inch Series.

.2 CAN/CGSB-8.2-M88, Sieves, Testing, Woven Wire, Metric.

.3 Canadian Standards Association (CSA)

.1 CAN/CSA-A3000-98-A5-98, Portland Cement.

.2 CAN/CSA-A23.1-00, Concrete Materials and Methods of Concrete Construction.

1.4 DEFINITIONS

.1 Excavation classes: two classes of excavation will be recognized; common excavation and rock excavation.

.1 Rock : any solid material in excess of 0.25 m^3 and which cannot be removed by means of heavy duty mechanical excavating equipment with 0.95 to 1.15 m^3 bucket. Frozen material not classified as rock.

.2 Common excavation: excavation of materials of whatever nature, which are not included under definitions of rock excavation.

.2 Unclassified excavation: excavation of deposits of whatever character encountered in Work.

.3 Topsoil: material capable of supporting good vegetative growth and suitable for use in top dressing, landscaping and seeding.

.4 Waste material: excavated material unsuitable for use in Work or surplus to requirements.

.5 Borrow material: material obtained from locations outside area to be graded, and required for construction of fill areas or for other portions of Work.

.6 Unsuitable materials:

.1 Weak and compressible materials under excavated areas.

.2 Frost susceptible materials under excavated areas.

.3 Frost susceptible materials:

.1 Fine grained soils with plasticity index less than 10 when tested to ASTM D4318, and gradation within limits specified when tested to ASTM D422 and ASTM C136 : Sieve sizes to CAN/CGSB-8.1 CAN/CGSB-8.2.

.2 Coarse grained soils containing more than 20 % by mass passing 0.075 mm sieve.

.7 Unshrinkable fill: very weak mixture of Portland cement, concrete aggregates and water that resists settlement when placed in utility trenches, and capable of being readily excavated.

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1.5 SUBMITTALS

.1 Samples:

.1 Submit samples in accordance with Section 01 33 00 - Submittal Procedures.

.2 Inform Consultant at least 2 weeks prior to commencing Work, of proposed source of fill materials and provide access for sampling.

.3 Submit 25 kg samples of type of fill specified including representative samples of excavated material.

.4 Ship samples prepaid to Inspection firm, in tightly closed containers to prevent contamination.

1.6 QUALITY ASSURANCE

.1 Qualification Statement: submit proof of insurance coverage for professional liability.

.2 Where Consultant/Engineer is employee of Contractor, submit proof that Work by Consultant/Engineer is included in Contractor's insurance coverage.

.3 Submit design and supporting data at least [2] weeks prior to commencing Work.

.4 Design and supporting data submitted to bear stamp and signature of qualified professional engineer registered or licensed in Province of Ontario, Canada.

.5 Keep design and supporting data on site.

.6 Engage services of qualified professional Engineer who is registered or licensed in Province of Ontario, Canada in which Work is to be carried out to design and inspect cofferdams, shoring, bracing and underpinning required for Work.

1.7 WASTE MANAGEMENT AND DISPOSAL

.1 Collect and separate plastic, paper packaging and corrugated cardboard and place in designated containers.

.2 Place materials defined as hazardous or toxic in designated containers.

.3 Ensure emptied containers are sealed and stored safely.

1.8 PROTECTION OF EXISTING FEATURES

.1 Refer to *Section 01 11 00 – 'Summary of Work – article 1.5 Existing Conditions'* and *Section 31 21 13 – 'Rough Grading'* for requirements to provide underground scan in addition to service locates for all areas of work beyond the property lines.

.2 Protect existing features in accordance with Section 01 56 00 - Temporary Barriers and Enclosures and applicable local regulations.

.3 Existing buried utilities and structures:

.1 Size, depth and location of existing utilities and structures as indicated are for guidance only. Completeness and accuracy are not guaranteed.

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.2 Prior to commencing excavation Work, notify applicable Owner or authorities having jurisdiction, establish location and state of use of buried utilities and structures. Owners or authorities having jurisdiction to clearly mark such locations to prevent disturbance during Work.

.3 Confirm locations of buried utilities by careful test excavations.

.4 Maintain and protect from damage, water, sewer, gas, electric, telephone and other utilities and structures encountered as indicated.

.5 Ensure that adjacent property is not damaged in any way by excavating and grading work; by the removing, stockpiling and transporting of materials; by blown sand and dust or by spillage during the removing, stockpiling and transporting of materials; by the collapse or movement of excavated banks and stockpiles; or by storm water from altered drainage course.

.6 Ensure that no damage is caused by earthwork to existing structures, trees, buried and above-ground services, bench marks, and survey monuments on the site, or adjacent property. Arrange or ensure that all damage which occurs is repaired completely and immediately.

.7 Protect newly-graded areas from the action of the elements. Repair settlement and washouts that occurs before acceptance of the work, and re-establish grades to the required elevations and slopes. Fill to required subgrade levels any area where settlement occurs.

.8 Bail or pump all water out of excavation, from whatever cause, as it accumulates. Take all necessary measures to prevent flow of water and earth fines into the excavation.

.9 Support existing buildings, walks, roads, and services, and prevent cave-ins of excavated banks. A Professional Engineer specializing in this work shall design all protection. Provide shop drawings for authorities as required.

.10 Temporarily cover all existing catchbasins and manholes to prevent entry of earth or debris.

.11 Electronically locate underground services such as electrical and telephone lines, gas and water and sewer lines. Mark line of services with yellow ribbons or stakes with tip fluorescent painted, and indicating both plan location and depth.

.12 Protect the bottom and sides of the excavated pits and trenches from exposure to sun and rain to prevent cave-ins and softening of the bed upon which concrete and drains rest.

1.9 DUST CONTROL

.1 Provide and maintain adequate system to avoid any nuisance caused by dust and dirt rising throughout the area of operations. The use of calcium chloride is prohibited.

1.10 UNIT PRICES REQUESTED IN TENDER FORM

.1 For excavation, prices shall include excavation and disposal and units shall represent material measured in its original position by cross-sectioning of the area excavated. Volumes will be computed from the cross-section measurements by average end area method.

.2 For fill, prices shall include material, compacted to specified degree and measured in place.

Part 2 Products

2.1 MATERIALS

.1 Fill "A": Granular material meeting OPSS Material Specification for Aggregates, Form 1010, Granular "A". Minimum compaction density 98% Standard Proctor. For use primarily as bedding material.

.2 Fill "B": Granular material meeting OPSS Material Specification for Aggregates, Form 1010, Granular "B"-Type 2. Minimum compaction density 100% Standard Proctor. For use primarily as **fill under building slab on grade, and under paved areas (asphalt and concrete) up to underside of sub-base elevation.**

.3 Fill "C": Site (native) material, containing no organic or foreign matter. Minimum compaction density: 95% Standard Proctor under landscaped areas. For use primarily as **fill under playfields.**

.4 Fill "D": Refer to Section 32 12 17 –'Asphalt Paving' for 50 mm Crushed limestone sub-base and 19 mm crushed limestone base course used under paved areas.

.5 Crushed Stone Fill Under Slabs on Grade: Clean, Graded 20mm angular, natural clear crushed stone from approved source, free from shale, clay and friable materials and organic matter and containing no more than 10% passing the No.4 sieve

.6 Impervious Fill: Fine grain material such as clay, which is relatively impervious to the flow of water.

.7 Granular Bedding: OPSS Granular "A", concrete sand (CAN/CSA A23.1-M90) or crusher-run limestone. Minimum compaction 100% Standard Proctor density.

Part 3 Execution

3.1 SITE PREPARATION

.1 Remove obstructions, ice and snow, from surfaces to be excavated within limits indicated.

.2 Cut pavement or sidewalk neatly along limits of proposed excavation in order that surface may break evenly and cleanly.

3.2 EXAMINATION

.1 Ensure in examination of the site that all possible factors concerning earthwork are investigated, and that the following are known in particular:

.1 Methods and means available for material handling, disposal, storage, and transportation.
.2 Physical conditions of site, including ground water table and drainage courses.
.3 Conformation and condition of ground surfaces.
.4 Character, quality, and quantity of surface and subsurface materials.

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3.3 SOIL INVESTIGATION

.1 Soil investigation of the site was carried out by other consultants engaged by the Owner for the purpose of guidance in design and construction. A report and bore hole log on this investigation were prepared and are provided for information purposes. No responsibility is assumed by the Owner or Architects for the scope, accuracy, or interpretation of the soil investigation report. Be responsible for adjusting estimates to incorporate conditions identified or reasonably inferred in the report, as documented in the Geotechnical Data.

3.4 STOCKPILING

.1 Stockpile fill materials in areas designated by Engineer Stockpile granular materials in manner to prevent segregation.

.2 Protect fill materials from contamination.

3.5 COFFERDAMS, SHORING, BRACING AND UNDERPINNING

.1 Obtain permit from authority having jurisdiction for temporary diversion of water course.

.2 Construct temporary Works to depths, heights and locations as directed by Engineer.

.3 During backfill operation:

.1 Unless otherwise as indicated or as directed by Engineer, remove sheeting and shoring from excavations.

.2 Do not remove bracing until backfilling has reached respective levels of such bracing.

.3 Pull sheeting in increments that will ensure compacted backfill is maintained at an elevation at least 500 mm above toe of sheeting.

.4 When sheeting is required to remain in place, cut off tops at elevations as indicated.

.5 Upon completion of substructure construction:

.1 Remove cofferdams, shoring and bracing.

.2 Remove excess materials from site and restore water courses as indicated and as directed by Engineer.

3.6 DEWATERING AND HEAVE PREVENTION

.1 Keep excavations free of water while Work is in progress.

.2 Dewater the site as necessary for the installation of the work, by providing a series of temporary trenches/pits and pumping as necessary. Backfill temporary trenches/pits and restore area when dewatering is no longer required.

.3 At no additional cost to the Owner, dewater the site as necessary to maintain the schedule and protect the work. Ensure the water pumped from site does not contaminate sewers municipal or on site sewer system. If required, arrange and pay for the cost of flushing sewers used for dewatering drainage routes.

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.4 Submit for Engineer's approval details of proposed dewatering or heave prevention methods, such as dikes, well points, and sheet pile cut-offs.

.5 Avoid excavation below groundwater table if quick condition or heave is likely to occur. Prevent piping or bottom heave of excavations by groundwater lowering, sheet pile cut-offs, or other means.

.6 Protect open excavations against flooding and damage due to surface run-off.

.7 Dispose of water in accordance with Section 01 35 43 - Environmental Procedures and in manner not detrimental to public and private property, or any portion of Work completed or under construction.

.8 Provide flocculation tanks, settling basins, or other treatment facilities to remove suspended solids or other materials before discharging to storm sewers, water courses or drainage areas.

3.7 EXCAVATION

.1 Advise Engineer at least 7 days in advance of excavation operations for initial cross sections to be taken.

.2 Refer to Geotechnical Investigation Report included in Binder C for instructions on soil removal, reuse, imported material and compaction.

.3 Remove top layer of soil and fill containing organics.

.4 Excavated material will be very sensitive to moisture content and handling. Granular B to be used to backfill areas and raise grades as required.

.5 Refer to Supplementary Information Form, Geotechnical Report and structural drawings for Alternate Trench and Pour foundation information.

.6 Perform bulk excavation and detailed excavation for construction of building (and for installation of mechanical and electrical services). Excavate beyond wall faces sufficiently to allow removal of forms, if applicable, but generally no more than 900 mm beyond centre of wall. Do not re-fill over excavated areas with materials removed, nor any other material without the approval of the Consultant. Excavation and disposal of boulders is part of this section.

.7 Note results of the Soil Chemical Testing Report provided in Binder C and account for disposal requirements in the bid price.

.8 Remove disturbed earth displaced by adjacent construction.

.9 Notify the Consultant of completion of excavation work and before any concrete or fill is placed on the bearing strata, in order that he may inspect the exposed bearing surfaces.

.10 Remove excess and unsuitable excavated materials from the site. Comply with the MOE regulations and those of other regulating bodies, regarding disposal of contaminated soil.

.11 Blasting is prohibited, except upon written permission of Consultant. Rock removal, if required, shall be by means of Ram Splitting equipment only.

.12 Keep all surfaces against which concrete, unit masonry or fill is to be placed free from frost. Thaw out frozen surfaces against which concrete or fill is to be placed to unfrozen depth.

.13 Excavation must not interfere with bearing capacity of adjacent foundations.

.14 Do not disturb soil within branch spread of trees or shrubs that are to remain. If excavating through roots, excavate by hand and cut roots with sharp axe or saw.

.15 Keep excavated and stockpilled materials a safe distance away from edge of trench as directed by Engineer.

.16 Restrict vehicle operations directly adjacent to open trenches.

.17 Do not obstruct flow of surface drainage or natural watercourses.

.18 Earth bottoms of excavations to be undisturbed soil, level, free from loose, soft or organic matter.

.19 Notify Engineer when bottom of excavation is reached.

.20 Obtain Engineer approval of completed excavation.

.21 Hand trim, make firm and remove loose material and debris from excavations. Where material at bottom of excavation is disturbed, compact foundation soil to density at least equal to undisturbed soil. Clean out rock seams and fill with concrete mortar or grout to approval of Engineer.

3.8 COMPACTION

.1 Provide, operate and maintain compacting equipment necessary to achieve the compaction densities specified.

.2 Compact fill until the required density is achieved. Do not compact material containing frost.

.3 Fill hollows and depressions which develop under compaction with matching backfill material. If the base becomes rutted or displaced due to any cause, regrade the surface.

.4 Compact backfill by means of vibratory type equipment capable of achieving the desired degree of compaction. Use manually operated vibratory tampers in the proximity of foundations and in areas not readily accessible to roller equipment. Make good damage to the structure due to compaction and settlement of fill. Report damage to foundations promptly to the Consultant. Obtain approval of remedial procedures.

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3.9 BACKFILLING

.1 Plug unused services such as drains, sewers, field tile, and service pipes uncovered by excavation.

.2 Backfill at foundation walls only after they have been approved by Consultant.

.3 Backfill with 200 mm deep layers of fill or as specified, each consolidated before the next is placed.

.4 Backfill to mechanical and electrical service trenches as specified in the electrical and mechanical specifications.

.5 When backfilling both sides of walls, place fill simultaneously on both inner and outer faces to balance pressure on wall.

.6 Where walls are to be backfilled on one side only, commence backfilling only when the ground floor structural members are in place, if applicable, or adequate bracing is provided for top and bottom of foundation walls.

.7 Compact fill to densities specified for material requirements.

.8 Do not proceed with backfilling operations until [Engineer] [Consultant] has inspected and approved installations.

.9 Areas to be backfilled to be free from debris, snow, ice, water and frozen ground.

.10 Do not use backfill material which is frozen or contains ice, snow or debris.

.11 Place backfill material in uniform layers not exceeding 150 mm compacted thickness up to grades indicated. Compact each layer before placing succeeding layer.

.12 Backfilling around installations.

- .1 Place bedding and surround material as specified elsewhere.
- .2 Do not backfill around or over cast-in-place concrete within 24 hours after placing of concrete.
- .3 Place layers simultaneously on both sides of installed Work to equalize loading.
- .4 Where temporary unbalanced earth pressures are liable to develop on walls or other structures:
  - .1 Permit concrete to cure for minimum 14 days or until it has sufficient strength to withstand earth and compaction pressure and approval obtained from Engineer.
  - .2 If approved by Engineer erect bracing or shoring to counteract unbalance, and leave in place until removal is approved by Engineer.

.13 Install drainage system in backfill as directed by Consultant.

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3.10 FILL UNDER FLOOR SLABS

.1 Prior to filling, proof-roll existing earth subgrade in order to identify inconsistencies or soft areas. Proceed with filling operations only after inconsistencies or soft areas have been reworked and compacted or excavated, backfilled and compacted as required to eliminate such conditions.

.2 Avoid proof-rolling close to caissons, columns, walls and other structures within the confines of the proof rolling operations.

.3 Prior to placing fill, ensure existing ground is compacted to 98% Standard Proctor density.

.4 Place approved granular B fill (Fill 'B') under floor slabs as soon as foundation walls are completed to floor level and mechanical and electrical services are installed in trenches.

.5 Place fill in layers of 150mm maximum and consolidate each before placing next layer.

.6 Compact fill to density specified for material requirements with a heavy vibrating roller. Compact fill adjacent to walls, piers, or wherever else heavy roller equipment cannot approach, with mechanical tampers to equivalent density. Dig out soft spots and re-fill and compact to specified density.

.7 Where undisturbed soil surface is low below areas of slab-on-grade, bring level up to within 200 mm of underside of slab fill and paved areas with Fill "B". Do not use fill "C" within building area or paved areas.

.8 Backfill trenches to within 200 mm of underside of slab fill with Fill "B".

.9 The final 200 mm layer under slabs shall be clear crushed stone, as specified. Place crushed stone in maximum 100 mm layers and compact to 100% Standard Proctor Density.

3.11 FILL UNDER PAVED AREAS

.1 Prior to filling, proof-roll existing earth subgrade in order to identify inconsistencies or soft areas. Proceed with filling operations only after inconsistencies or soft areas have been reworked and compacted or excavated, backfilled and compacted as required to eliminate such conditions.

.2 Avoid proof-rolling close to caissons, columns, walls and other structures within the confines of the proof rolling operations.

.3 Prior to placing fill, ensure existing ground is compacted to 98% Standard Proctor density.

.4 Place specified granular fill in layers of 150mm maximum, and consolidate each before placing next layer, up to underside of pavement sub-base elevation.

.5 Compact fill to density specified for material requirements with a heavy vibrating roller. Compact fill adjacent to walls, piers, or wherever else heavy roller equipment cannot

approach, with mechanical tampers to equivalent density. Dig out soft spots and re-fill and compact to specified density.

3.12 FILL UNDER PLAYFIELDS AND LANDSCAPED AREAS

.1 Construction access, contractor parking areas and Portables Area are intended to be reinstated in time for sod to have a minimum of 6 weeks to "take" prior to Fit for Occupancy. Identify this target date on the project schedule. Conduct site work and schedule accordingly to complete work related to sodding these areas as early as possible prior to contract completion.

.2 Use Fill "C" native site material for fill under the landscaped areas as indicated on drawings.

.3 Prior to placing fill, ensure existing ground is compacted to 95% Standard Proctor Density.

.4 Place fill in layers of 300 mm maximum and consolidate each before placing next layer.

.5 Compact Fill "C" to minimum 95% Standard Proctor Density under playfields.

3.13 RESTORATION

.1 Upon completion of Work, remove waste materials and, trim slopes, and correct defects as directed by Consultant.

.2 Place topsoil as directed by Consultant.

.3 Reinstate lawns to elevation which existed before excavation.

.4 Reinstate pavements and sidewalks disturbed by excavation to thickness, structure and elevation which existed before excavation.

.5 Clean and reinstate areas affected by Work as directed by Consultant.

.6 Use temporary plating to support traffic loads over unshrinkable fill for initial 24 hours.

.7 The Owner will engage the services of an Inspection and Testing Company to verify that work conforms to the requirements of the specifications.

.8 The Contractor shall cooperate fully with the testing and inspection company.

.9 The Contractor shall maintain its own quality control program to ensure that its work conforms to the drawings and specifications.

.10 Submit 4 kg. samples of the fill materials to the inspection and testing company at least 10 days prior to commencement of backfill operations. Materials tested and approved shall constitute a standard for the acceptance of material delivered to the site.

.11 The inspection and testing company shall be responsible for the following work:

.12 Determine the depth of unsatisfactory material, if any, to be removed.

.13 Inspect and approve the sub-grade prior to commencement of backfill operations.

.14 Test and approve the proposed backfill materials.

.15 Be present full time during operations in order to inspect and approve the methods of placing and compacting and to carry out the necessary tests to determine the Proctor Density of the backfill and the actual field densities being obtained. Take sufficient tests to ensure that adequate information is obtained to judge the uniformity of compaction. Inspect all piping and conduit in place in trenches prior to backfilling to ensure correct slope and placement as designed.

.16 Check the quality of backfill being delivered to the site.

.17 Check the depth of granular fill.

.18 Confirm bearing elevations. Confirm and record spot elevations of all piping at critical locations to confirm design depths and slopes.

.19 Check installation of weeping tile.

.20 Issue reports to the Consultant tabulating test results and giving final approval and suggestions as to the backfilling and compaction operation.

.21 The cost of such inspection and testing shall be paid for under the Fill and Compaction Testing Allowance specified in Section 01 11 00- Summary of Work. The cost of retesting unacceptable compaction shall be borne by this Section.

3.14 INSPECTION AND TESTING

.1 Refer to Section 01 11 00- Summary of Work, Section 1.29.

END OF SECTION

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Part 1 General

1.1 RELATED SECTIONS

.1 Section 013543 – Environmental Protection.

.2 Section 329121 – Topsoil and Finish Grading.

.3 Section 329310 – Planting of Trees, Shrubs and Ground Covers.

.4 Section 31 23 10 - Excavation, Trenching and Backfilling.

.5 Section 33 46 20 – Foundation and Underslab Drainage .

.6 Section 033000 – Cast-in-Place Concrete.

.7 Section 32 12 17 – Asphalt Paving.

1.2 REFERENCES

.1 American Society for Testing and Materials (ASTM)

.1 ASTM D698-[91(1998)], Test Method for Laboratory Compaction Characteristics of Soil Using Standard Effort (600 kN-m/m ^{3}).

1.3 EXISTING CONDITIONS

.1 Refer to Drawings and other sections regarding extent of fill and rough grading completed previously be the subdivision developer.

.2 Contractor shall coordinate and obtain required separate Permits for all work to public boulevard areas outside the property line. Refer to *Section 00 11 00 – 'Summary of Work, article 1.5 Existing Conditions*' and *Section 00 21 13 – 'Instructions to Bidders, article 1.26'* for additional permit requirements prior to construction.

.3 Refer to Geotechnical Report. Note that boreholes refer to data recorded prior to previous bulk rough grading contract being executed. Note that depth of previous excavation prior to backfill is provided for areas within the building envelope. Contractor is responsible to coordinate with Structural Drawings and Specifications to determine depths of foundations.

.4 Contractor is responsible to quantify all on-site material to achieve design grades and is responsible for the importation or exportation of material from the site as required.

.5 Known underground and surface utility lines and buried objects are indicated on site plan. Confirm exact locations of utility lines and buried objects prior to machine excavation or grading. In addition to all utility locates, contractor shall conduct engage a private locate company to conduct an underground scan for all areas of grading and excavation outside the property lines.

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1.4 PROTECTION

.1 Protect and/or transplant existing trees, landscaping, natural features, bench marks, pavement, surface or underground utility lines which are to remain as directed by Consultant. If damaged, restore to original or better condition unless directed otherwise.

.2 Maintain access roads to prevent accumulation of construction related debris on roads.

Part 2 Products

2.1 MATERIALS

.1 Fill material to all parking and driveway areas, asphalt and concrete paving areas and building pad: Fill 'B'- OPSS Granular B-Type 2 in accordance with of Section 31 23 10 - Excavating, Trenching and Backfilling.

.2 Excavated or graded material existing on site (Fill 'C') may be suitable to use as fill to the playfield area if approved by Consultant and uncontaminated type of existing materials meets the requirements herein for stated locations.

Part 3 Execution

3.1 STRIPPING OF TOPSOIL

.1 There is no reusable topsoil on this site. Topsoil has already been generally stripped and removed from the site as part of previous fill and rough grading operations.

.2 Do not handle topsoil while in wet or frozen condition or in any manner in which soil structure is adversely affected as determined by Consultant

.3 Examine the site and determine the extent of areas previously stripped and approximate depth of remaining topsoil, if any.

.4 Strip the remaining topsoil from the site as part of the work in this Section.

.5 Remove any remaining top soil that may exist from areas to be excavated, paved and regraded.

.6 Strip top soil when dry enough to prevent contamination of subgrade.

.7 Contractor is responsible to quantify all on-site material to achieve design grades and is responsible for the importation or exportation of material from the site as required. Existing excess topsoil, if any, must be quantified before tender and may be re-used for general sodded areas as described in Section 32 91 21 Topsoil Placement and Grading.

.8 Remove from site existing grass and vegetation and surplus top soil, if any.

3.2 GRADING

.1 Grading Plan includes the existing, as-built conditions of the site within the property limits.

.2 The Contractor shall use the information shown on the site plan, the grading plan, the Geotechnical Report, as well as the information observed during visits to the site during the Tender Period, as the. basis for the "Existing Conditions" of the site.

.3 Rough grade to levels, profiles, and contours allowing for surface treatment as indicated. Ensure that rough grading operations to not promote water ponding in construction areas. Level depressions outside the building area with Type “D” for paved areas or Type “C” fill if suitable moisture content and compaction can be demonstrated.

.4 Perform construction grading to allow proper construction access to the work.

.5 Grade to prevent water ponding on site during construction period. Create additional ditches, swales, slopes, ponds, etc. as required by Contract Documents and Municipal Authorities for control of drainage, sedimentation and topsoil retention.

.6 Unless suitable uncontaminated fill or cut has been completed by previous contract, rough grade to following depths below finish grades:

- .1 150 mm for grassed areas.
- .2 400 mm for flowerbeds.
- .3 450 mm for shrub beds.
- .4 600 mm for heavy asphalt paving.
- .5 540 mm for medium duty asphalt paving.
- .6 275 mm for concrete walks.
- .7 Maximum tolerance for rough grade elevation : .+- 25 mm

.7 Slope rough grade away from building 1:50 2 % minimum.

.8 Grade swales and ditches to depths as indicated.

.9 Prior to placing fill over existing ground, scarify surface to depth of 150 mm. Maintain fill and existing surface at approximately same moisture content to facilitate bonding.

.10 Compact filled and disturbed areas to maximum dry density to ASTM D698, as follows:

- .1 95% under landscaped areas.
- .2 98 % under paved and walk areas.

.11 Do not disturb soil within branch spread of trees or shrubs to remain.

3.3 TESTING

.1 Inspection and testing of soil compaction will be carried out by testing agency hired by the owner.

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.2 Tests to be conducted on imported soils and provided by a ULC designated laboratory prior to bringing to and placing on the site.

.3 Costs of tests will be paid under a Cash Allowance. Refer to Section 01 11 00 – Summary of Work.

.4 Submit testing procedure, frequency of tests, [testing laboratory as designated by ULC or certified testing personnel to Consultant for approval and review.

3.4 SURPLUS MATERIAL

.1 Remove surplus material and material unsuitable for fill, grading or landscaping as directed by Consultant and Municipal Authorities.

.2 Include for removal and disposal of asphalt driveways, excess fill, rubble, etc. beyond property lines within work areas shown on SG.1 and SS.1

.3 Confirm locations on site prior to tender.

END OF SECTION

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1. GENERAL

1.1. General Requirements

1. Conform to the requirements stated in the General Conditions, Supplementary General Conditions of this Specification and all addenda for all work.

1.2. Related Work

1. Aggregates — Section 31 05 17

1.3. References

1. ASTM D4791-10, Test Method for Flat or Elongated Particles in Coarse Aggregate.
2. Ontario Provincial Standard Specification 1001.

2. PRODUCTS

2.1. Materials

1. Aggregate quality: sound, hard, durable material free from soft, thin, elongated or laminated particles, organic material, clay lumps or minerals, or other substances that would act in deleterious manner for use intended.
2. Geotextile for siltation control fence shall be Class I non-woven geotextile fabric in accordance with OPSS 1860.

2.2. Source Quality Control

1. Inform Consultant of proposed source of aggregates and provide access for sampling at least four weeks prior to commencing production.
2. If, in opinion of Consultant, materials from proposed source do not meet, or cannot reasonably be processed to meet, specified requirements, locate an alternative source or demonstrate that material from source in question can be processed to meet specified requirements.
3. Advise Consultant four weeks in advance of proposed change of material source.
4. Acceptance of material at source does not preclude future rejection if it fails to conform to requirements specified, lacks uniformity, or if its field performance is found to be unsatisfactory.

3. EXECUTION

3.1. Installation

1. Silt Control Fence
    1. Install silt control fence along construction site perimeter including tee bars, geotextile filter fabric, clear stone along the upstream side of the fence in the instance the ground is frozen.

3.2. Maintenance

1. Maintain silt control fencing for the duration of the construction and replace as required until the site is stabilized.

END OF SECTION

Part 1 GENERAL

1.1 GENERAL REQUIREMENTS

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

1.2 REFERENCES

.1 Tree Protection and Tree Canopy Preservation Policy, Town of Oakville.

.2 Town Tree Protection During Construction Procedure, Town of Oakville

1.3 SCHEDULING

.1 Obtain approval from Consultant of schedule indicating commencement of work.

1.4 ACTION AND INFORMATIONAL SUBMITTALS

.1 Provide monthly written reports on maintenance during warranty period, to Consultant identifying:

.1 Maintenance work carried out.

.2 Development and condition of plant material.

.3 Preventative or corrective measures required which are outside Contractor's responsibility.

1.5 MAINTENANCE DURING WARRANTY PERIOD

.1 From time of acceptance by Consultant and Town of Oakville to end of warranty period, perform following maintenance operations, if recommended by Consultant.

.1 Water to maintain soil moisture conditions for optimum growth and health of plant material without causing erosion.

.2 Remove dead, broken or hazardous branches from plant material to proper arboricultural and horticultural standard practices.

.3 Apply mulch over root zone.

Part 2 PRODUCTS

2.1 MATERIALS

.1 Burlap: Type 2, biodegradable

.2 Hoarding Stakes: 2x4” lumber.

.3 Hoarding: Heavy duty /wired 1.2m ht. orange snow fence or waferboard

Part 3 EXECUTION

3.1 TREE REMOVAL AND INJURY PERMITS

.1 Ensure necessary removal and injury permits are in place prior to the commencement of work.

.1 Tree removal shall not take place during the breeding bird windows of April 1st to September 31st of any given year.

.2 Prior to the commencement of tree removals, the contractor must confirm that no migratory birds are marking use of the trees slated for removal. Contractor must ensure works are in conformance with the Migratory Bird Convention Act.

3.2 IDENTIFICATION AND PROTECTION

.1 Tree protection to be installed prior to the start of any on site work.

.2 Identify plants, condition of plants, and limits of root systems to be preserved to satisfaction of Consultant. Report any discrepancy in plant condition and preservation status to prior to any removal.

.3 Protect plant and root systems from damage, compaction and contamination resulting from construction by erecting Tree Preservation Hoarding as shown on L1.1 Landscape Plan to the satisfaction of Consultant and Town of Oakville.

.4 Ensure no root pruning is done inside drip line. If pruning inside drip line is required consult an arborist or Canadian Certified Horticultural Technician (CCHT) as approved by Consultant.

3.3 TREE PROTECTION ZONE

.1 Except where authorized by Town of Oakville, any activity which could result in injury or destruction of a protected tree, is prohibited within a Tree Protection Zone (TPZ), including, but not limited to, any of the following examples:

.1 Demolition, construction, replacement or alteration of permanent or temporary buildings or structures, parking pads, driveways, sidewalks, walkways, paths, trails, dog runs, pools, retaining walls, patios, decks, terraces, sheds or raised gardens.

.2 Installation of large stones or boulders.

.3 Altering grade by adding or removing soil or fill, excavating, trenching, topsoil or fill scraping, compacting soil or fill, dumping or disturbance of any kind.

.4 Storage of construction materials, equipment, wood, branches, leaves, soil or fill, construction waste or debris of any sort.

.5 Application, discharge or disposal of any substance or chemical that may adversely affect the health of a tree e.g. concrete sluice, gas, oil, paint, pool water or backwash water from a swimming pool.

.6 Causing or allowing water or discharge, to flow over slopes or through natural

areas.

.7 Access, parking or movement of vehicles, equipment or pedestrians.

.8 Cutting, breaking, tearing, crushing, exposing or stripping tree's roots, trunk and branches.

.9 Nailing or stapling into a tree, including attachment of fences, electrical wires or signs

.10 Stringing of cables or installing lights on trees.

.11 Soil remediation, removal of contaminated fill.

.12 Excavating for directional or micro-tunnelling and boring entering shafts.

If possible, these prohibitions should also be implemented outside the TPZ in areas where tree roots are located. The roots of a tree can extend from the trunk to approximately 2-3 times the distance of the dripline.

3.4 ARBORICULTURAL WORK

.1 Any roots or branches which extend beyond the tree protection zone(s) indicated on the Landscape Plan which require pruning, and trees which require transplanting, must be performed by a Qualified Arborist or other tree professional as approved by Town of Oakville. All work performed on tree roots and branches must be in accordance with good arboricultural standards. The Arborist/tree professional must contact Consultant. Town of Oakville no less than 48 hours prior to conducting any specified work.

END OF SECTION

Part 1 General

1.1 RELATED SECTIONS

.1 Section 01 33 00 - Submittal Procedures

.2 Section 31 23 13 - Rough Grading

.3 Section 31 23 10 – Excavation, Trenching and Backfilling

.4 Section 32 13 15 - Concrete Curbs

.5 Section 32 13 16 - Concrete Sidewalk

.6 Section 32 17 23 – Pavement Markings

1.2 REFERENCES

.1 American Society for Testing and Materials International, (ASTM)

.1 ASTM D698-[00a], Standard Test Methods for Laboratory Compaction Characteristics of Soil Using Standard Effort (12,400 ft-lbf/ft^3 (600 kN-m/m^3)).

.2 Canadian General Standards Board (CGSB)

.1 CAN/CGSB-1.5- [M91 (March 1999)], Low Flash Petroleum Spirits Thinner (Reaffirmation of December 1991).

.2 CAN/CGSB-1.74- [2001], Alkyd Traffic Paint.

.3 Government of Québec, Minister of Transport

.1 Cahier des charges et devis généraux (CCDG)-[97].

.4 Ontario Provincial Standard Specifications (OPSS)

.1 OPSS 302-[April 1999], Construction Specification for Primary Granular Base.

.2 OPSS 310-[March 1993], Construction Specification for Hot Mixed, Hot Laid Asphaltic Concrete Paving and Hot Mix Patching.

.3 OPSS 314-[December 1993], Construction Specification for Untreated Granular, Subbase, Base, Surface Shoulder and Stockpiling.

.4 OPSS 1010-[March 1993], Material Specification for Aggregates, Granular A, B, M and Select Subgrade Material.

.5 OPSS 1103-[February 1996], Material Specification for Emulsified Asphalt.

.6 OPSS 1150-[May 1994], Material Specification for Hot Mixed, Hot Laid Asphalt Concrete.

1.3 SAMPLES

.1 Submit samples in accordance with Section 01 33 00 - Submittal Procedures.

.2 Submit to Consultant, samples of material for sieve analysis at least 2 weeks before beginning Work.

1.4 WASTE MANAGEMENT AND DISPOSAL

.1 Remove from site and dispose of all packaging materials at appropriate recycling facilities.

.2 Place materials defined as hazardous or toxic in designated containers.

.3 Divert unused aggregate materials from landfill to facility for reuse as approved by Consultant.

.4 Dispose of unused paint and paint thinner materials at official hazardous material collections site as approved by Consultant.

.5 Fold up metal banding, flatten and place in designated area for recycling.

.6 Do not dispose of unused paint and paint thinner material into sewer system, into streams, lakes, onto ground or in other location where it will pose health environmental hazard.

.7 Divert unused asphalt from landfill to facility capable of recycling materials.

1.5 EXTENDED WARRANTY

.1 Submit a warranty for asphalt paving installation, covering materials and labour and the repair or replacement of defective work in accordance with the Contract, but for two (2) years total.

Part 2 Products

2.1 MATERIALS

.1 Sub-Base**:** Suitably compacted native material only where approved density and drainage is achieved**.** Otherwise in upfill locations use Fill type"B" where required to reach design elevations.

.2 Base: 50 mm and 19 mm graded, crusher run limestone to depths indicated on AD details.

.3 Heavy Duty Pavement for Parking and Driveways**:** Hot mix, hot laid asphaltic concrete HL8 and HL3, mixture conforming to O.P.S.S. #1150.05.

.4 Medium Duty Pavement for Play Areas and Walkways**:** Hot mix, hot laid asphaltic concrete HL8 and HL3, mixtures conforming to O.P.S.S. #1150.05.

.5 Joint Painting Material**:** SS-1 emulsion in accordance with O.P.S.S. #1103.05.

Part 3 Execution

3.1 PREPARATION

.1 Regard locations and instructions on drawings. Report any discrepancies or questions to the Consultant prior to proceeding with the work. In particular pay attention to the exact delineation of all edges of pavement and types of pavement;

.2 Set out work in accordance with lines and levels shown on Drawings. Maintain such lines and levels through duration of work. Ensure positive drainage toward catch basins is maintained in all areas.

.3 Compact sub-grade to a minimum of 98% Standard Proctor density.

.4 Ensure the granular base extends beyond the proposed edge of asphalt where otherwise unsupported.

.5 Paint exposed edge of asphaltic joints, edge of manhole and catchbasin frames, curbs and similar items with SS-1 emulsion.

3.2 INSTALLATION

.1 Inspect site grades prior to installation. Review the precise grade requirements required on the grading plan. Review with the Consultant prior to installation if any conditions exist that may cause deviations from grades shown on Drawings. Coordinate catchbasin elevations with those shown on Mechanical site plan.

.2 Pavement Section:

.1 Heavy Duty: at all parking and driveway areas (refer also to site drawings)

- .1 minimum 300 mm compacted thickness of 50 mm crusher run limestone compacted to 100% Standard Proctor Maximum Dry Density (SPMDD), ASTM-D698.
- .2 150 mm compacted thickness Base course of 19 mm crusher run limestone compacted to 100% SPMDD.
- .3 60 mm compacted thickness of granular asphalt HL8.
- .4 40 mm compacted thickness of granular asphalt HL3.

.2 Medium Duty: at parking areas & at rear and side yard play and walkway areas noted on Site Plans.(refer also to site drawings)

- .1 thickness of 50 mm crusher run limestone compacted to 100% Standard Proctor Maximum Dry Density (SPMDD), ASTM-D698.
- .2 150 mm compacted thickness Base course of 19 mm crusher run limestone compacted to 100% SPMDD.
- .3 40 mm compacted thickness of granular asphalt HL8.
- .4 40 mm compacted thickness of granular asphalt HL3.

.3 Placing Granular Materials:

.1 Exercise due care at all times to prevent granular materials from being contaminated by clay or other types of deleterious materials.

.2 Place materials immediately after sub-grade is inspected by the Architect and as follows:

- .1 To required width and thickness indicated on Drawings in layers not exceeding 100 mm compacted thickness granular B or crusher run limestone pending timing of installation.
- .2 Grade each layer and compact to a minimum 100% standard Proctor density to a smoother surface conforming to required cross-section.

.4 Finished surface of granular material must not deviate more than 10 mm from designed grade.

.5 Placing Asphaltic Pavement:

.1 Obtain Consultant's inspection of compacted granular base before commencing asphalt paving.

.2 Air temperature during placing of mixture must be minimum 7 deg. C and rising. Temperature of mixture when spread must be not less than 120 deg. C nor more

than 150 deg. C. Do not increase temperature of mixture to offset long distance hauling.

.3 Compact asphaltic mixture as soon as it can bear roller without undue displacement and hairline cracking and continue until all roller marks are eliminated. Speed of roller must at all times be slow enough to avoid displacement of mixture. Keep roller wheels slightly moistened by water to prevent adhesion of mixture. Excess water will not be permitted. Compact mixture with hot tampers in locations that are not easily accessible to machine roller.

.4 Rolling Procedure:

.1 Initial and final rolling must be accomplished using self-propelled Class "B" roller.

.2 Intermediate rolling must be carried out using self-propelled Class "C" roller or "D" roller. Intermediate roller must follow breakdown roller as closely as possible.

.5 Upon completion of compaction each pavement course must be:

.1 Smooth and true to crown and grade with variation not more than 6 mm from thickness shown on Drawing. Do not place any asphaltic course less than 25 mm thick nor more than 75 mm thick.

.2 Free from depressions exceeding 3 mm as measured with 3 m straight edge paralleling centre line of driveways/aisles.

.3 Compacted to a density not less than 97% Marshall.

.6 Finishing:

.1 Backfill all curbs.

.7 Joints:

.1 Cut back bituminous course to its full depth in straight or curved lines as required to expose fresh, straight, vertical surface. Remove broken and loose material.

.2 Asphalt must be placed in such a manner that joint must not be allowed to cool before adjacent asphalt course is applied.

.3 Where paving is comprised of two or more courses, joints must overlap by not less than 600 mm.

.4 Carefully place and compact hot asphaltic material against joints. Correct any unsatisfactory joint before proceeding with work.

.5 Feathering of joints will not be permitted.

.8 Inspection and Testing:

.1 Refer to Section 01 11 00 – Summary of Work, section 1.29.

.2 Field inspections during installation and core samples of all asphalt areas will be taken as part of Inspection and Testing. **If tests show asphalt to be substandard to that specified, all asphalt shall be removed and replaced at the Contractor's expense. Cash credits will not be accepted for work which does not fully comply with drawings and specifications.**

3.3 CERTIFICATION OF GRADES

.1 The Contractor is required to provide as-constructed elevations of the parking area by an O.L.S. surveyor to verify that the parking lot has been constructed in accordance with the contract drawings.

END OF SECTION

Part 1 General

1.1 RELATED SECTIONS

.1 Section 11 68 00 Play Equipment

.2 Section 31 22 00 Landscape Grading

.3 Section 33 46 00 Landscape Subdrainage

1.2 PERFORMANCE REQUIREMENTS

.1 Engineered Wood Fiber Test results for Engineered Wood Fiber must show G-max values of less than 120G for a 12" system with a 12' drop height, and HIC values less than 1,000.

1.3 SUBMITTALS

.1 The following shall be submitted:

.1 Manufacturers description of product, installation methods, base preparation and maintenance instructions.

.2 MSDS sheets for materials used to construct the same.

.3 Manufacturer's warranty information.

Part 2 Products

2.1 ENGINEERED WOOD FIBER (EWF) SAFETY SURFACE

.1 Mulch safety surface to be FIBAR wood fibre play surfacing as manufactured by Fibar Systems, 1-800-342-2721 or approved equivalent.

.2 Filter Fabric: non-woven 270R as manufactured by Terrafix Geosynthetics Inc. or approved equal.

.3 Subsurface drainage: Refer to Section 33 46 00 Landscape Subdrainage

2.2 RUBBER SAFETY SURFACE

.1 Refer to Section 32 12 18 Rubber Play Surfacing.

2.3 SAND BOX

.1 Sand surface

.1 Sand to be granitic sand playground sand in accordance with ASTM C136 as supplied by Hutcheson Sand Mixes, 1-800-461-5521 or approved equal.

.2 Sand should be free of organic material, dirt, clay, silt, iron, asbestos and other contaminants.

.2 Filter fabric

.1 Non woven 270R as manufactured by Terrafix Geosynthetics Inc. or approved equal.

.3 Base

.1 19mm clear stone to OPSS 1004.

.4 Custom Sand Box Cover

.1 Texelene Sand Box Cover, custom fabricated and field verified to suit size of sandbox c/w nylon turnbuckles as fabricated and supplied by Maribay Designs or approved equal. Colour to be Green.

.5 Subsurface drainage: Refer to Section 33 46 00 Landscape Subdrainage

Part 3 Execution

3.1 ENGINEERED WOOD FIBER SAFETY SURFACE

.1 Excavation

.1 Excavate play areas to depth as necessary to accommodate engineered wood fiber safety surface at the required play surface.

.2 Subgrade

.1 Prior to placement of engineered wood fiber, the surface is to be proof-rolled and approved by the testing company.

.3 System Installation

.1 Install drainage tile in locations as shown on plan and as required to ensure appropriate drainage under all play areas. Outlet drains at low point or catch basin as shown on plan.

.2 Install engineered wood fibre to depth indicated on plans as per manufacturers instructions.

3.2 SAND BOX

.1 Install horizontal log sand box edge as per Section 11 68 00 Play Equipment.

.2 Install drainage tile in locations as shown on the landscape plan. Outlet to nearest CB as required to positively drain the sand play areas. Install drainage tile in accordance with Section 33 46 00 Landscape Subdrainage.

.3 Install granular base in 150mm lifts to specified depth and compact to 98% standard proctor density.

.4 Place sand to a minimum thickness of 450mm.

3.3 CLEAN UP

.1 Sweep any spills or clean any residue that may make contact with surrounding curbs or sidewalks.

END OF SECTION

Part 1 General

1.1 RELATED WORK

.1	Section 03 30 01	Landscape Cast in Place Concrete
.2	Section 32 13 13	Concrete Paving and Edges
.3	Section 32 46 00	Landscape Subdrainage.

1.2 SCOPE OF WORK

.1 This specification covers the performance requirements, submittals, materials, base preparation, layering, installation and guarantee of poured-in-place safety surfacing.

1.3 PERFORMANCE REQUIREMENTS

.1 Rubber Surfacing installed within equipment use zones shall exceed the performance requirements for impact attenuation and Head Injury Criteria as per CSA Z614 Standards confirming a maximum deceleration of no more than 200 gMax and a HIC value of no more than 1000 as per ASTM F-1292 and CSA Z614 method of testing.

.2 The impact attenuation performance shall be documented by a certificate of compliance and shall be performed using Triax 2000 non-destructive testing apparatus within 30 days of installation.

.3 Play Safety Surfaces installed within equipment use zones shall exceed the performance requirements for impact attenuation and Head Injury Criteria as per CAN/CSA Z614:20 and ASTM F1292.

1.4 SUBMITTALS

.1 The following shall be submitted:

- .1 Toxicology Testing Report performed by a Certified Canadian Laboratory.
- .2 Manufacturers description of product, installation methods and maintenance instructions.
- .3 Detailed shop drawings of safety surfacing edging details and material thickness.
- .4 Color chart of available colors.
- .5 MSDS sheets for materials used to construct the same.
- .6 Test results confirming product has been tested and in compliance with ASTM F-1292 and CAN/CSA Z614-14.
- .7 Statement from the Manufacturer that the system to be installed shall only be performed by authorized and trained personnel.
- .8 Statement from Manufacturer that the binders used in the system has been specifically designed for water play surfacing.
- .9 Sample of the surface system minimum size being 3" x 3".

.10 Manufacturer's warranty information.

Part 2 Materials

2.1 TPV

.1 Product: PlaySoft as supplied by Ure-Tech Surfaces Inc. (T:905-623-0600) or approved equivalent.

.1 Shall meet the following gradations granulated rubber: 1 - 3.5 mm.

.2 TPV rubber shall meet ASTM D 412 for tensile strength.

.3 Polyurethane binders shall be specially formulated for playground surfacing, shall contain no TDI, filler minerals such as plasticizers, catalysts, extenders or heavy metals. Weight of polyurethane shall be no less than 8.5 lbs./gal (1.02 Kg/l).

.4 Primer: Single component moisture cured UTS- 136.01 polyurethane primer.

.5 Binder: An elastic polyurethane pre-polymer with minimal odour, excellent weathering and binding characteristics. The use of UTS- 136.01 Urethane is specific to and required for this project. Supplier must receive written authorization prior to installing the product which verifies use supply of urethane specified for this project. No as equal urethane substitutions are permitted. UTS-136.01 is supplied by Ure-Tech Surfaces Inc. 1-866-211-0191.

.6 Aliphatic binder (UTS 151.01) for non-yellowing.

.7 Colour to be selected by Owner from Colour Chart.

.2 TPV Rubber Collar: PlaySoft Rubber Mulch as supplied by Ure-Tech Surfaces Inc. (T:905-623-0600) or approved equivalent.

.1 Primer: Single component moisture cured polyurethane primer.

.2 Binder: An elastic polyurethane pre-polymer with minimal odor, excellent weathering and binding characteristics. The use of UTS- 136.01 binder is a prerequisite.

.1 100 percent MDI based binder.

.3 Rubber: Mandatory use of an engineered 100% recycled rubber buffing raw material, organically color blended, and is delivered and manufactured strictly of rubber buffing material reclaimed from tire recapping facilities verses that of whole tire recycling operators who produce a ground up chip or granule. The loose-fill must not carry any unwanted characteristics of whole tire recycling, including steel or fabric. The loose-fill shall consist of rubber particles ranging in size from 3/8" to 2". Rubber buffing must be organically colored and laboratory tested successfully for a ten (10) year color retention period using test method 420AFU colourfastness to light Xenon (separate from warranty) A tri-color blend of color is to be proportionately mixed to blend in with the natural environment of public play parks.

.4 Thinner: A thinner, approved by the safety surface manufacturer shall be used for cleaning tools.

.5 Safety Surface System:

.1 Shall have been tested for shock attenuation under ASTM F1292.

.2 Shall have been tested for non-slip characteristics under ASTM E-303.

.3 Shall have been tested for ease of ignition under BS-5696 and ASTM D-2859.

.4 Shall have been tested for fire resistance under ASTM E648.

.5 Shall contain no latex.

.6 Colour: Cypress

2.2 FILTER FABRIC

.1 Terratex SD geofilter fabric

.2 Approved equivalent

2.3 GRANULAR BASE

.1 Rubber Berms: Compacted Granular 'A' to OPSS 1010.

.2 Rubber Surfaces: 19mm clear stone to OPSS 1004.

2.4 FLUSH CONCRETE EDGE

.1 Refer to Section 03 30 01 Landscape Cast-in-Place Concrete

2.5 SUBDRAINAGE

.1 Refer to Section 33 46 00 Landscape Subdrainage.

Part 3 Execution

3.1 GENERAL

.1 Install as per manufacturer's installation instructions.

.2 Rubber Surfacing is only installed by qualified and authorized installers with a minimum of three years installation experience.

.3 Play surfaces are to be installed with thickness appropriate to achieve performance criteria as outlined above. Play surface thickness is correlated with the height of the play equipment components.

3.2 WEATHER CONDITIONS

.1 Temperatures: minimum 10° during the day and evening hours throughout installation period for the rubber surfacing to be installed. Note: With cooler temperatures rubber finish will be noticeably more rough than a typical in-season installation.

.2 UTS Binder is moisture cured with the presence of water. Sub-base cannot have any puddling or standing water when applying rubber. Once base rubber is applied, the rubber must be free of wetness from dew and/or frost or rain prior to applying top wear course.

.3 When applying multi-colour rubber patterns, the bonding edges must be dry or foaming will occur. This includes bonding to all perimeter materials such as brick, concrete, wood. etc.

.4 Rubber should be protected at all times against frost during the curing of both base and top wear course to prevent freezing of the uncured binder which can cause premature wear and or failure of the performance of the rubber.

.5 October 30 will be the cut off date for starting new installations, unless temperatures are favourable. All installations after this date are subject to a sign off on our Weather & Temperature document.

.6 If temperatures are below 10° tenting and heating is permissible. Tent must be constructed in such a way to withstand weather conditions of fall and or winter weather.

3.3 BASE PREPARATION

.1 In order to ensure the consistent performance of the safety surfacing, bases must be constructed to ensure a firm, stable and draining foundation for the surface. Any and all contaminated materials or materials that are subject to decomposition or expansion shall be removed and disposed of.

.2 Install drainage system under the safety surfacing system.

.3 The granular base will be a minimum of 150mm (6”) deep and compacted to 95% Proctor density. Local site conditions will dictate if additional granular is required. Note: granular base should be installed in maximum 150mm (6”) lifts, watered and compacted.

.4 The granular base can be sloped up to 30 degrees or hills may be incorporated into the installation. Other than obvious undulations, the granular base must be smooth in the direction of the grade.

.5 In a playground where the rubber surface thickness varies as a result of the height of playground equipment the base can be graded smooth or dug down to accommodated the change in thickness within the base, leaving a smooth final surface.

3.4 SURFACE INSTALLATION

.1 After the stone base has been constructed to manufacturer specifications, graded and compacted to proper slope and elevations, install Terratex SD geotextile filter fabric over base, overlapping all joints by 6". Provide protection to curbs, sidewalks and play equipment to eliminate polyurethane residue on the same.

.2 Polyurethane and buffings SBR rubber for base mat must be minimum 50% new buffings from recycled tires mixed with binder produced in North America and clearly labeled with a minimum 8% urethane per by weight of rubber. Rubber shall be thoroughly mixed on site to ensure 100% coverage of all particles and poured in place to required thickness to meet critical height criteria of play equipment. Allow 24 hrs. to cure.

.3 Prior to installing wearing course, the edging shall be primed with diluted polyurethane binder.

.4 Surface layer of TPV rubber shall be thoroughly mixed on site to ensure 100% coverage of all particles and poured in place by means of rakes and screed bars and compacted to required density by use of hand trowels and rollers.

.5 TPV rubber shall be peroxide cured.

3.5 PLAY SURFACES

.1 Cushion layers are to be installed with thickness appropriate to achieve performance criteria as outlined above. Play surface thickness is correlated with the height of the play equipment components.

3.6 CLEANUP

.1 Remove any spills or residue that may make contact with structure or surrounding curbs or sidewalks. On completion of work and the 24 hr. cure time, remove all protection provided for the same.

END OF SECTION

Part 1 General

1.1 RELATED REQUIREMENTS

.1 Section 03 10 01 Landscape Concrete Forming and Accessories

.2 Section 03 30 01 Landscape Cast-in-Place Concrete

1.2 REFERENCE STANDARDS

.1 ASTM International

.1 ASTM C117-[13] , Standard Test Method for Materials Finer than 0.075 mm (No. 200) Sieve in Mineral Aggregates by Washing.

.2 ASTM C136/C136M-[14] , Standard Test Method for Sieve Analysis of Fine and Coarse Aggregates.

.3 ASTM C 309 [03] , Liquid Membrane Forming Compounds for Curing Concrete.

.4 ASTM D1751, Standard Specification For Preformed Expansion Joint Filler for Concrete Paving and Structural Construction (Nonextruding and Resilient Bituminous Types).

.5 ASTM D698-[12e2] , Standard Test Method for Laboratory Compaction Characteristics of Soil Using Standard Effort (12,400ft-lbf/ft3) (600 kN-m/m3).

.2 CSA Group

.1 CSA-A23.1-[14] /A23.2-[14] , Concrete Materials and Methods of Concrete Construction/Methods of Test and Standard Practices for Concrete, Including Update No. 1 [2015] .

.2 CSA B651-[2012] Accessible Design for the Built Environment.

1.3 ACTION AND INFORMATIONAL SUBMITTALS

.1 Product Data:

.1 Submit manufacturer's printed product literature, specifications and datasheet and include product characteristics, and limitations.

.2 Inform Consultant of proposed source of materials and provide access for sampling minimum 4 weeks prior to commencing work.

.3 If materials have been tested by independent testing laboratory within previous 2 months and have passed tests equal to requirements of this specification, submit test certificates from testing laboratory showing suitability of materials for this project.

Part 2 Products

2.1 MATERIALS

.1 Concrete mixes and materials: in accordance with Section 03 30 01 – Landscape Cast-in-Place Concrete.

.2 Reinforcing steel:

.1 For paved surfaces: WWM 152 x 152 MW11.1

.2 For Curbs and Edges: three #10M, or two #15M, epoxy coated continuous bars, placed as indicated on drawings.

.3 Joint filler: in accordance with Section 03 30 01 – Landscape Cast-in-Place Concrete.

.4 Granular base:

.1 Granular 'A' in accordance with OPSS 101.05.02.

.5 Non-staining mineral type form release agent: chemically active release agents containing compounds reacting with free lime to provide water-soluble soap.

.6 Curing Agent: to ASTM C309, Type 1.

.7 Expansion Joint Filler: Premoulded bituminuous fibre board, conforming to ASTM D1751.

.8 Tactile Walking Surface Indicators: In accordance with Section 32 33 00 Site Furnishings and AODA compliant.

2.2 FINISHES:

.1 Pedestrian Concrete Paving: As indicated on drawings.

.1 Uniform broom finish to produce regular corrugations not exceeding 2mm deep, perpendicular to route of travel.

.2 Do not tool or radius edges of joints.

.2 Raised Concrete Edges: As indicated on drawings.

.1 Formed with steel trowel top, 10mm chamfer public facing side of edge

.2 Keep form joints to a minimum.

.3 Flush Concrete Edges: As indicated on drawings.

.1 non-slip wood float finish

.2 Keep form joints to a minimum.

Part 3 Execution

3.1 GRADE PREPARATION

.1 Do grade preparation work in accordance with Section 31 23 33.01- Excavating, Trenching and Backfilling.

.2 Construct embankments using excavated material free from organic matter or other objectionable materials.

.1 Dispose of surplus and unsuitable excavated material off site.

.3 Place fill in maximum 150mm layers and compact to minimum 98% of maximum dry density to ASTM D698.

3.2 GRANULAR BASE

.1 Obtain Consultant's approval of subgrade before placing granular base.

.2 Place granular base material to lines, widths, and depths as indicated.

.3 Compact granular base in maximum 150 mm layers to minimum 98 % of maximum density to ASTM D698.

3.3 CONCRETE

.1 Obtain Consultant's approval of granular base and reinforcing steel prior to placing concrete.

.2 Do concrete work in accordance with Section 03 30 00- Cast-in-Place Concrete.

.3 Immediately after floating, give sidewalk surface uniform broom finish to produce regular corrugations not exceeding 2mm deep, by drawing broom side to side across sidewalk.

.4 Provide edging as indicated on drawings.

.5 Slip-form pavers equipped with string line system for line and grade control may be used if quality of work acceptable to Consultant can be demonstrated. Hand finish surfaces when directed by Consultant.

3.4 TOLERANCES

.1 Finish surfaces to within 3mm in 3m as measured with 3m straightedge placed on surface.

3.5 EXPANSION AND CONTRACTION JOINTS

.1 Install tooled transverse contraction joints after floating, when concrete stiff, but still plastic, at intervals of shown on drawings.

.2 Install expansion joints as indicated on drawings or at intervals of no more than 6m.

.3 When sidewalk adjacent to curb, make joints of curb, gutters and sidewalk coincide.

3.6 ISOLATION JOINTS

.1 Install isolation joints around manholes and catch basins and along length adjacent to concrete curbs, catch basins, buildings, or permanent structures.

.2 Install joint filler in isolation joints in accordance with Section 03 30 01 – Landscape Cast-in-Place Concrete.

.3 Seal isolation joints with sealant approved by Consultant.

3.7 TACTILE WALKING SURFACE INDICATORS

.1 Install tactile walking surface indicators at curb ramp edges , where indicated on drawings and in accordance with local municipal by-laws and AODA.

3.8 CURING

.1 Cure concrete by adding moisture continuously in accordance with CSA-A23.1/A23.2 to exposed finished surfaces for minimum 1 day after placing, or sealing moisture in by curing compound.

.2 Where burlap used for moist curing, place two prewetted layers on concrete surface and keep continuously wet during curing period.

.3 Apply curing compound evenly to form continuous film, in accordance with manufacturer's requirements.

3.9 BACKFILL

.1 Allow concrete to cure for 7 days prior to backfilling.

.2 Backfill to designated elevations with material as directed by Consultant.

.1 Compact and shape to required contours as indicated.

3.10 CLEANING

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

END OF SECTION

1. **GENERAL**

1.1 **Related Sections**

1.1.1 Site Plan drawings and Binder C detail drawings.

1.2 **Samples**

1.2.1 Submit a sample panel in accordance with Section 01 33 00 - Submittal Procedures.

1.3 **Warranty**

1.3.1 5 years after the date of installation that the panels purchased shall be free from defects in material and workmanship and shall not split or crack under normal use and conditions.

2. **PRODUCTS**

2.1 **Materials**

2.1.1 Detectable Warning Panels

.1 600mm x 600mm Detectable Warning Tactile Panels made with reinforced high strength concrete, polymer composite or ceramic.

.2 CASTinTACT® as manufactured by Masons Supply Company 2637 SE 12th Ave., Portland, Oregon 97202. Telephone (503) 234-4321.

.3 Approved Alternates: Armor-Tile dist. by Engineered Plastics Inc. or approved alternates.

.4 Install to be approx. 24" x 60" – 72" wide.

3. **EXECUTION**

3.1 **Installation**

3.1.1 Panels are to be cast in concrete at top of all pedestrian depressed curbs (whether shown on drawings or not) and additional locations where shown on drawings and where required by municipal by-law.

3.1.2 The work shall consist of all labor, material, tools, equipment and services necessary to satisfactorily complete the installation of detectable/tactile warning surfaces in non-vehicular areas, at curb ramps and other locations such as depressed corners, raised crosswalks, raised intersections, borders of medians and islands, the edge of transit platforms, and sidewalks where railroad tracks cross to warn pedestrians of an upcoming change from pedestrian to vehicular way.

3.1.3 Install per manufacturers recommendations.

3.1.4 Expansion joints and control joints shall be located in compliance with manufacturer's recommendations. Joint materials shall follow manufacturer's directions and instructions.

3.1.5 Protect installed products until completion of project. If necessary, protect panels with plywood and an underlayment layer of non-staining, non-woven curing blanket until acceptance of work. Secure plywood if needed.

END OF SECTION

□

Part 1 General

1.1 REFERENCE STANDARDS

.1 ASTM International

.1 ASTM C136-[13] , Standard Test Method for Sieve Analysis of Fine and Coarse Aggregates.

.2 ASTM C140, Standard Test Methods for Sampling and Testing Concrete Masonry Units and Related Units.

.3 ASTM C936, Standard Specification for Solid Concrete Interlocking Paving Units.

.4 ASTM C979/C979M-[10] , Standard Specification for Pigments for Integrally Colored Concrete.

.5 ASTM C1645 Standard Test Method for Freeze-thaw and De-icing Salt Durability of Solid Concrete Interlocking Paving Units

.2 CSA Group

.1 CSA A23.1/A23.2-[09] , Concrete Materials and Methods of Concrete Construction/Test Methods and Standard Practices for Concrete.

.2 CAN/CSA-A179-[04(R2009)] , Mortar and Grout for Unit Masonry.

.3 CSA A231.1/A231.2-[06(R2010)] , Precast Concrete Paving Slabs/Precast Concrete Pavers.

.4 CSA A283-[06(R2011)] , Qualification Code for Concrete Testing Laboratories.

1.2 ACTION AND INFORMATIONAL SUBMITTALS

.1 Submit in accordance with Section 01 33 00- Submittal Procedures.

.2 Product Data:

.1 Submit manufacturer's instructions, printed product literature and data sheets for precast concrete unit paving and include product characteristics, performance criteria, physical size, finish and limitations.

.3 Samples:

.1 Submit full size samples of each paver type, thickness, colour and finish that indicate the range of colour variation and texture expected upon project completion for consultant approval.

.2 Accepted samples become the standard of acceptance for the product produced.

.4 Test and Evaluation Reports:

.1 Submit following sampling and testing data:

.1 Sieve analysis for gradation of bedding and joint material.

.2 Unit paver sampling and testing.

.3 Evaluation of sealing and cleaning compound.

.4 Certificates: submit product certificates signed by manufacturer certifying materials comply with specified performance characteristics and criteria and physical requirements.

1.3 QUALITY ASSURANCE

.1 Qualifications:

.1 Installer: company or person specializing in precast concrete paver installations of similar complexity, size and material with 5 documented years of experience.

.2 Mock-ups:

.1 Construct mock-up in accordance with Section 01 45 00- Quality Control.

.2 Construct 3 x 3 m area mock-up.

.3 Mock-up will be used:

.1 To judge quality of work, substrate preparation, operation of equipment and material application.

.2 To determine surcharge of bedding layer, joint sizes, lines, laying patterns, colours, texture and levelness.

.3 Locate mock-up where directed by Consultant.

.4 Allow 48 hours for inspection of mock-up before proceeding with work.

.5 When accepted, mock-up will demonstrate minimum standard of quality required for this work. Approved mock-up may remain as part of finished work.

1.4 DELIVERY, STORAGE AND HANDLING

.1 Deliver, store and handle materials in accordance with manufacturer's written instructions.

.2 Delivery and Acceptance Requirements: deliver materials to site in original factory packaging, labelled with manufacturer's name and address.

.3 Storage and Handling Requirements:

.1 Store materials off ground in dry location and in accordance with manufacturer's recommendations in clean, dry, well-ventilated area.

.2 Store and protect materials free from mud, dirt, and other foreign materials.

.3 Store and protect precast concrete units from nicks, scratches, and blemishes.

.4 Replace defective or damaged materials with new.

.4 Coordinate delivery and paving schedule to minimize interference with normal use of streets and sidewalks adjacent to paver installation.

.5 Prevent joint and sand setting bed sand from exposure to rainfall, or removal by wind with secure, waterproof covering.

1.5 PROJECT / SITE CONDITIONS

.1 Environmental Requirements:

.1 Install pavers only on unfrozen setting bed aggregate materials

.2 Install pavers only on unfrozen base or sub-base aggregate materials

.3 Install base or subbase only over unfrozen subgrade

.4 Install setting bed sand or pavers only when there is no heavy rain or snowfall.

.5 Install polymeric joint sand only when ambient temperature is above 5◦C, under dry conditions with no rain forecast for 24 hours and when surface of pavement is completely dry.

1.6 CONCRETE PAVER OVERAGE AND ATTIC STOCK

.1 Provide a minimum of 5% additional material for overage to be used during construction.

.2 Contractor to provide a minimum of 10 sq. m of each product and size used to owner for maintenance and repair. Furnish pavers from the same production run as installed materials.

Part 2 Products

2.1 CONCRETE PAVERS

.1 Concrete pavers to be manufactured by Techo-Bloc or approved equivalent.

.2 Concrete Paver Type 1: Industria Granitex Commercial Pavers

.1 Size: 300x600x100mm

.2 Colour: Greyed Nickel

.3 Finish: HD2 Granitex

.3 Concrete Paver Type 2: Industria Granitex Commercial Pavers

.1 Size: 200x400x100mm

.2 Colour: Greyed Nickel

.3 Finish: HD2 Granitex

.4 Pavers shall meet the minimum material and physical properties set forth in ASTM C936.

.1 Average compressive strength 8000psi (55 MPa) with no individual unit under 7,200 psi (50 MPa)

.2 Average absorption of 5% with no greater than 7% when tested according to ASTM C140.

.3 Conforming to ASTM C 1645 when tested for freeze-thaw requirements.

.4 Height tolerances +/- 3.2mm.

.5 Pigment in concrete pavers: to ASTM C979/C979M.

.6 Maximum allowable breakage of product is 5%.

2.2 JOINT MATERIAL

.1 Unit Paving Joint Sand

.1 Washed, clean, non-plastic, free from deleterious or foreign matter, symmetrically shaped, natural or manufactured from crushed rock.

.2 Do not use limestone screenings, stone dust, or sand for the Joint Sand material that does not conform to conform to the grading requirements of ASTM C 33.

.3 Utilize sands that are as hard as practically available where concrete pavers are subject to vehicular traffic.

.4 Gradation as shown in Table below:

Table – Joint Sand
Gradation Requirements for Joint Sand

ASTM C144		
Sieve Size	**Natural Sand Percent Passing**	**Manufactured Sand Percent Passing**
No. 4 (4.75 mm)	100	100
No. 8 (2.36 mm)	95 to 100	95 to 100
No. 16 (1.18 mm)	70 to 100	70 to 100
No. 30 (0.600 mm)	40 to 75	40 to 75
No. 50 (0.300 mm)	10 to 30	20 to 40
No. 100 (0.150 mm)	2 to 15	10 to 25
No. 200 (0.075)	0 to 1	0 to 10

.5 Polymeric Joint Sand:

.1 Product as recommended by unit paver manufacturer.

.2 Colour to be selected from colour chart by the consultant.

.3 Provide Polymeric Joint Sand meeting the minimum material and physical properties as follows:

.1 Compression Strength: proven resistance to compression of 550 PSI after drying for 7 days under controlled conditions (73°F (23°C) at 50% humidity).

.2 Gradation as shown in Table 1 above.

2.3 SETTING BED

.1 Unit Paving Setting Bed Sand

.1 Washed, clean, non-plastic, free from deleterious or foreign matter, symmetrically shaped, natural or manufactured from crushed rock.

.2 Do not use limestone screenings, stone dust, or sand material that does not conform to conform to the grading requirements of ASTM C 33.

.3 Do not use mason sand or sand conforming to ASTM C 144.

.4 Utilize sands that are as hard as practically available where concrete pavers are subject to vehicular traffic.

.5 Conform to the grading requirements of ASTM C 33 with modifications as shown in Table below:

Table – Setting Bed Sand

Gradation Requirements for Setting Bed Sand	
ASTM C 33	
Sieve Size	**Percent Passing**
3/8 in (9.5 mm)	100
No. 4 (4.75 mm)	95 to 100
No. 8 (2.36 mm)	85 to 100
No. 16 (1.18 mm)	50 to 85
No. 30 (0.600 mm)	25 to 60
No. 50 (0.300 mm)	10 to 30
No. 100 (0.150 mm)	2 to 10
No. 200 (0.075)	0 to 1

2.4 PRECAST UNIT PAVING BASE

.1 Unit Paving Concrete Base

.1 Refer to Section 32 13 13 Concrete Paving and Edges.

2.5 CLEANING COMPOUND

.1 Clear, organic solvent, designed and recommended by manufacturer for cleaning concrete pavers of contamination encountered.

.2 Acid based chemical detergent, designed and recommended by manufacturer for removal of contamination encountered on pavers.

2.6 SEALING COMPOUND

.1 Sealing compound to be used only as recommended by manufacturer where applicable.

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 precast concrete unit paving installation in accordance with manufacturer's written instructions and requirements for installation tolerances and other conditions affecting performance prior to placing concrete pavers.

.1 Unit Paving on Aggregate Base:

.1 Verify that the Base aggregate materials, thickness, compacted density, surface tolerances and elevations conform to specified requirements.

.2 Provide written density test results for soil subgrade, base and subbase aggregate to Owner and Consultant.

.3 Verify location, type, and elevations of edge restraints, concrete curbs, concrete collars around utility structures and drainage inlets.

.2 Inform Consultant of unacceptable conditions immediately upon discovery.

.3 Proceed with installation only after unacceptable conditions have been remedied.

.1 Beginning Paver installation signifies acceptance of base and edge restraint conditions.

3.2 INSTALLATION OF EDGE RESTRAINTS

.1 Install restraints true to grade, in accordance with manufacturer's recommendations and as shown on drawing details.

3.3 PRECAST UNIT PAVING BASE

.1 Unit Paving on Concrete Base:

.1 Verify the Concrete Base has cured.

.2 Verify the Concrete base thickness, strengths, surface tolerances and elevations conform to the specified requirements.

.1 Verify that top of concrete surface (top of base) does not exceed plus or minus 10mm of grade over 3m straightedge.

.3 Ensure that concrete surface has no standing water is present during installation.

.4 Provide written density test results for soil subgrade, concrete underlayment psi testing to the Owner and Consultant.

.5 Verify location, type, and elevations of edge restraints, concrete curbs, concrete collars around utility structures and drainage inlets.

3.4 SETTING BED

.1 Unit Paving:

.1 Provide, spread and screed Setting Bed Sand evenly over the compacted Base Aggregate course.

.1 Protect screeded Setting Bed Sand from being disturbed by either pedestrian or vehicular traffic.

.2 Screed only the area which can be covered by pavers in one day.

.3 Do not use Setting Bed Sand material to fill depressions in the aggregate base surface.

.2 Keep moisture content constant and density loose and constant until Concrete Pavers are set and compacted.

.3 Screed Setting Bed Sand using either an approved mechanical spreader (e.g.: an asphalt paver) or by the use of screed rails and boards. Maintain in a loose condition slightly ahead of the paving units and fully protect against incidental compaction following screeding. Loosen compacted sand by rain or screeded sand left overnight before further paving units are placed.

.4 Inspect the Setting Bed Sand course prior to commencing the placement of the Concrete Pavers. Acceptance of the Setting Bed Sand occurs with the initiation of Concrete Paver placement.

3.5 INSTALLATION OF CONCRETE PAVERS

.1 Replace Concrete Pavers with chips, cracks, voids, discolorations, and other defects that might be visible in finished work.

.2 Mix Concrete Pavers from a minimum of three (3) bundles simultaneously drawing the paver vertically rather than horizontally, as they are placed, to produce uniform blend of colors and textures.

.3 Exercise care in handling face mix concrete pavers to prevent surfaces from contacting backs or edges of other units.

.4 Provide Concrete Pavers using laying pattern as indicated. Adjust laying pattern at pavement edges such that cutting of edge pavers is minimized. Cut all pavers exposed to vehicular tires no smaller than one-third of a whole paver.

.5 Use string lines or chalk lines on Setting Bed to hold all pattern lines true.

.6 Set surface elevation of pavers 1/8 in. (3 mm) above adjacent drainage inlets, concrete collars or channels.

.7 Place units hand tight against spacer bars. Adjust horizontal placement of laid pavers to align straight.

.1 When installation is performed with mechanical equipment, use only unit pavers with spacer bars on sides of each unit.

.8 Provide space between paver units of 1/32 in. (1 mm) wide to achieve straight bond lines.

.9 Prevent joint (bond) lines from shifting more than ±1/2 in. (±13 mm) over 50 ft. (15 m) from string lines.

.10 Fill gaps between units or at edges of the paved area that exceed 3/8 inch (10 mm) with pieces cut to fit from full-size unit pavers.

.11 Cut unit pavers with motor-driven masonry saw equipment to provide clean, sharp, unchipped edges. Cut units to provide pattern indicated and to fit adjoining work neatly. Use full units without cutting where possible. Hammer cutting is not acceptable.

.12 Prevent all traffic on installed Concrete Pavers until joint material has been vibrated into joints. Keep skid steer and forklift equipment off newly laid Concrete Pavers that have not received initial compaction and Joint material.

.13 Vibrate Concrete Pavers into leveling course with a low-amplitude plate vibrator capable of a to 5000-lbf (22-kN) compaction force at 80 to 90 Hz. Perform at least three passes across paving with vibrator. Vibrate under the following conditions:

.1 After edge pavers are installed and there is a completed surface or before surface is exposed to rain.

.2 Compact installed Concrete Pavers to within 6 feet (1.8 meters) of the laying face before ending each day's work. Cover Concrete Pavers that have not been compacted and leveling course on which pavers have not been placed, with nonstaining plastic sheets to prevent Setting Bed from becoming disturbed.

.14 Protect face mix Concrete Paver surface from scuffing during compaction by utilizing a urethane pad.

3.6 INSTALLATION OF JOINT MATERIAL

.1 Remove any cracked or structurally damaged Concrete Pavers and replace with new units prior to installing Joint material.

.2 Provide, spread and sweep joint material into joints immediately after vibrating pavers into Setting Bed course until full. Vibrate pavers and add Joint material until joints are completely filled, then remove excess material. This will require at least 4 passes with a plate compactor.

.3 Remove excess Joint material broom clean from surface when installation is complete.

.4 Polymeric Joint Sand for Non-Permeable Unit Paving

.1 Install polymeric joint sand per manufacturers recommended instructions.

3.7 FIELD QUALITY CONTROL

.1 Verify final elevations for conformance to the drawings after sweeping the surface clean.

.1 Prevent final Concrete Paver finished grade elevations from deviating more than ±3/8 in. (±10 mm) under a 10 ft (3 m) straightedge or indicated slope, for finished surface of paving.

.2 Paver-to-Paver Lippage:

.1 No greater than 3 mm (1/8 inch) difference in height between adjacent pavers.

3.8 REPAIRING, CLEANING AND SEALING

.1 Remove and replace unit pavers that are loose, chipped, broken, stained, or otherwise damaged or that do not match adjoining units. Provide new units to match adjoining units and install in same manner as original units, with same joint treatment and with no evidence of replacement.

.2 Cleaning: Remove excess dirt, debris, stains, grit, etc. from exposed paver surfaces; wash and scrub clean.

.1 Clean Concrete Pavers in accordance with the manufacturer’s written recommendations.

3.9 PROTECTION

.1 Protect completed work from damage due to subsequent construction activity on the site.

END OF SECTION

1 General

1.1 RELATED SECTIONS

.1 Section 32 12 16 – Asphalt Paving

1.2 GENERAL

.1 This section specifies the painting of pavement markings

1.3 QUALITY ASSURANCE

.1 The Contractor must have at least 3 years experience in the painting of pavement markings

1.4 INSPECTION

.1 Obtain the approval of the Owner of pavement markings before proceeding.

2 Products

2.1 MATERIALS

.1 Traffic paint: alkyd type to CGSB 1-GP-74M + Amdt-May-81:

.1 Colours:

.1 White: Traffic paint white 9011 by ICI or equivalent product by other manufacturer approved by Consultant.

.2 Yellow: Traffic paint yellow 36419 by ICI or equivalent product by other manufacturer approved by Consultant.

.3 Blue: Traffic paint Blue by ICI or equivalent product by other manufacturer approved by Consultant.

.2 Paint applicator: approved pressure type mobile equipment, capable of depositing paint uniformly, at rates required.

.3 Concrete: 25MPa strength at 28 days; slump 75mm maximum at point of deposit ready mixed at plant and transported to the site by truck in accordance with CSA CAN A23. I-M77. The contractor is responsible for ensuring concrete mixes conform to the above. No consultant approval shall be given for concrete mixes.i

PART 3 - EXECUTION

3.1 PREPARATION

.1 Substrates shall be dry, free from water, frost, ice, dust, oil, grease and any other foreign substance which would impair proper bonding and performance of paint.

.2 Lay out traffic markings prior to paint application. Space control points at intervals to ensure accurate spacing and direction of lines.

3.2 APPLICATION

.1 Spray paint parking zone lines and other pavement markings required, including but not limited to, hatch marks for no parking areas, direction arrows and handicap parking symbols.

.2 Apply paint in two coats at rate of 3 m²/L. Allow first coat to fully cure prior to application of second coat.

.3 Apply paint only when ambient temperature is above 10 deg. C and wind speed is less than 15 km/h, and no rain is forecast within the next 12 hours.

.4 Use templates for symbols, arrows, lettering.

.5 Unless otherwise indicated, paint lines 100 mm wide.

.6 Paint lines straight or uniformly curved, with well defined, sharp edges.

.7 Paint speed bumps.

.8 Paint curb depressions for the disabled in accordance with OBC 1997.

.9 Unless otherwise shown provide the following colours:

.1 White: stop bars, arrows and driving lane designation lines separating traffic traveling in same direction.

.2 Yellow: centre lines, parking stall lines, hatch marks, painted medians and barrier free curb depressions.

.3 Blue: barrier free parking symbols.

END OF SECTION

Part 1 General

1.1 SUMMARY

.1 Synthetic turf surfacing system, including artificial turf, subbase preparation and placement of aggregate base course, and turf infill.

1.2 RELATED WORK

.1 Section 32 13 13 Concrete Paving and Edges

1.3 STANDARD PRODUCT AND MATERIAL SPECIFICATIONS

.1 ASTM International (ASTM)

.1 ASTM D1335 - Test Method for Tuft Bind of Pile Yarn Floor Coverings.

.2 ASTM D2859 - Standard Test Method for Ignition Characteristics of Finished Textile Floor Covering Materials.

.3 ASTM E84 - Standard Test Method for Surface Burning Characteristics of Building Materials.

.4 ASTM E108 - Standard Test Methods for Fire Tests of Roof Coverings.

.5 ASTM E648 - Standard Test Method for Critical Radiant Flux of Floor-Covering Systems Using a Radiant Heat Energy Source.

.6 ASTM F1015 - Standard Test Method for Relative Abrasiveness of Synthetic Turf Playing Surfaces.

.7 ASTM F1292 - Standard Specification for Impact Attenuation of Surfacing Materials Within the Use Zone of Playground Equipment.

.8 ASTM F1951 - Standard Specification for Determination of Accessibility of Surface Systems Under and Around Playground Equipment.

.2 CSA Group

.1 CSA Z614:20 – Children’s playground equipment and surfacing

1.4 ACTION AND INFORMATIONAL SUBMITTALS

.1 Product Data: For each type of product specified.

.2 Shop Drawings: Provide installation details including, methods of attachment and details at penetrations and terminations

.1 Show marking plan, if any, indicating details for specified activity areas.

.3 Samples: For each type of synthetic turf surfacing indicated.

.1 Minimum 12-by-12-inch- square sample of synthetic turf surface.

.4 Qualification Data: For Installer

.5 Warranty: Manufacturer's warranty of synthetic turf system.

1.5 MAINTENANCE MATERIAL SUBMITTALS

.1 Furnish extra materials that match products installed and that are packaged with protective covering for storage and identified with labels describing contents.

.1 Seaming Materials: Sufficient quantity for 100 sq. ft.

.2 Synthetic Turf Fiber: Sufficient quantity for 100 sq. ft.

.3 Infill Material: Sufficient quantity for 100 sq. ft., in weatherproof bags.

1.6 QUALITY ASSURANCE

.1 Manufacturer Qualifications: A firm experienced in manufacturing synthetic turf surfacing materials similar to those specified for this project, with a record of successful service for a minimum of 10 years.

.2 Installer Qualifications: An experienced Installer certified by the manufacturer, employing workers trained and approved by manufacturer, who has successfully installed work similar in design and extent to that required for the project, in not less than 5 projects of similar scope.

.3 Source Limitations: Obtain synthetic turf surfacing materials through one source from a single manufacturer.

.1 Provide secondary materials including adhesives, paint, thread, and repair materials of type and from source recommended by manufacturer of synthetic turf surfacing materials.

1.7 PROJECT CONDITIONS

.1 Weather Limitations: Proceed with installation only when existing and forecasted weather conditions permit synthetic turf surfacing installation to be performed according to manufacturers' written instructions and warranty requirements.

1.8 COORDINATION

.1 Coordinate installation of synthetic turf surfacing with installation of site paving, playground equipment, adjacent lawns, landscaping materials, site lighting, and related work.

1.9 DELIVERY, STORAGE, AND HANDLING

.1 Packing and Shipping: Deliver products in original unopened packaging with legible

manufacturer's identification.

.2 Storage and Protection:

.1 Comply with manufacturer's recommendations.

.2 Store in dry place out of direct sunlight.

.3 Protect from damage by the elements and construction procedures.

1.10 WARRANTY OF SYNTHETIC TURF SYSTEM

.1 Manufacturer's Warranty: Submit manufacturer's standard published limited warranty form in which manufacturer agrees to repair or replace components of synthetic turf surfacing installation installed by manufacturer-certified Installer that fail in materials under normal use and maintenance, or provide other relief, within specified warranty period.

.1 Failures include ultraviolet degradation, backing integrity, more than 50 percent loss of face fiber, and loss of tuft bind strength.

.2 Warranty Period: Life of product.

.2 Installer Project Warranty: Submit synthetic turf surfacing Installer's warranty, signed by Installer, covering the Work of this Section, including installation of all components of synthetic turf surfacing system, for the following warranty period:

.1 Warranty Period: Two years from date of Substantial Completion.

Part 2 Products

2.1 GENERAL

.1 All backing layers and coatings shall be firmly bonded together. Coating materials must be completely cured and bonded to the other backing layers. Synthetic turf panels or rolls that do not meet this requirement will be rejected.

.2 The entire system shall be resistant to weather, insects, rot, mildew, and fungus growth, and be non-allergenic and non-toxic. The entire system shall be constructed to maximize dimensional stability, to resist damage and normal wear and tear from its designated use, and to minimize ultraviolet degradation.

.3 All adhesives used in bonding the system together shall be resistant to moisture, bacterial and fungus attacks, and resistant to ultraviolet rays at any location upon installation.

2.2 PERFORMANCE REQUIREMENTS

.1 Shock Attenuation Value: Provide synthetic turf system with G-max value not exceeding 200 and Head Injury Criteria (HIC) not exceeding 1,000 in accordance with ASTM F 1292 and CSA Z614, based upon application and fall height indicated on Drawings.

.2 Fire-Test-Response Characteristics: Provide products with the critical radiant flux classification indicated in Part 2, as determined by testing identical products per ASTM E648 by an independent testing and inspecting agency acceptable to authorities having jurisdiction.

.3 Exterior Fire-Test Exposure: Provide synthetic turf surfacing materials identical to those of assemblies tested for Class A fire resistance according to ASTM E108 or UL 790 by Underwriters Laboratories or another testing and inspecting agency acceptable to authorities having jurisdiction.

.4 Accessibility Requirements:

.1 Comply with applicable provisions in CSA Z614 Annex H and Accessibility for Ontarians with Disabilities Act (AODA) for recreation surfaces.

.2 Provide synthetic turf system meeting requirements of ASTM F1951.

2.3 SYNTHETIC TURF

.1 Complete surfacing system, consisting of delustered UV-stabilized antimicrobial synthetic yarns bound to water-permeable bio-based primary and secondary backing. IPEMA-certified. Non-abrasive blades with low surface temperature. Anti-Static and Ultra Violet reflective pigment-enhanced.

.2 Source Limitations: Obtain synthetic turf surfacing materials through one source from a single manufacturer.

.1 Provide secondary materials including adhesives, paint, thread, and repair materials of type and from source recommended by manufacturer of synthetic turf surfacing materials.

.3 Product: Play Premium as manufactured by SynLawn or approved equivalent.

.1 Colour to be selected from colour chart.

.4 Artificial Turf Fiber and Construction Characteristics:

.1 Yarn, Turf Zone: Polyethylene, Biomimetic C

.1 Color: Field green + apple.

.2 Denier, ASTM D1577: 10,800/6.

.3 Antimicrobial Protection

.4 Antistatic Protection

.2 Yarn, Thatch Zone: Polyethylene.

.1 Color: Field Green + beige.

.2 Denier, ASTM D1577: 5,000/8.

.3 Finished Pile Height, ASTM D5823: 1-1/2 inch.

.4 Face Weight, ASTM D5848: 80 oz/sq. yd.

.5 Tuft Machine Gauge: 3/8 inch.

.6 Backing, Primary: 6 oz./sq. yd. 15/18 polypropylene, 2 layers with fiber-

reinforcing core.

.7 Backing, Secondary: 22 oz./sq. yd. bio-based urethane.

.1 Anti Fungi and Anti Algae blended into secondary backing.

.8 Total Fabric Weight: 108 oz./sq. yd.

.5 Performance Characteristics:

.1 Tuft Bind, ASTM D1335: Not less than 8 lb.

.2 Grab tear strength, ASTM D5034: Not less than 200 lbf.

.3 Elongation to break, ASTM D2256: Not less than 30 percent.

.4 Yarn breaking strength, ASTM D5793: Not less than 20 lb.

.5 Flammability, ASTM D2859: Pass.

.6 Fire Test Exposure, ASTM E108: Class A.

.7 Heavy Metal Analysis, EN71-3

2.4 SYNTHETIC TURF INFILL

.1 Temperature-Reducing Ballast: Silica sand and moisture-retaining coated sand ballast.

.1 Product: T°Cool Synthetic Turf Cooling Infill as manufactured by T°Cool (T:404-490-3554), or approved equivalent.

.2 No infill to be used in water play area.

2.5 FALL PAD

.1 Rubber, lead, and heavy metal-free non-degradeable porous elastic pad, with permeability of not less than that of specified artificial turf surfacing, composed of 100 percent recycled non-contaminated post-industrial closed cell polyethylene foam, geotextile weed barrier faced on one side.

2.6 GLUE, SEAMING FABRIC AND THREAD

.1 Per manufacturer’s recommendations, suitable for application.

2.7 TURF SPIKES

.1 Per manufacturers approved fasteners.

2.8 NAILER BOARD

.1 Per manufacturer’s approved nailer / edger board.

2.9 FLUSH CONCRETE CURBS

.1 Refer to Section 32 13 13 Concrete Paving and Edges.

2.10 GRANULAR BASE

.1 High Performance Bedding: 3/8" clear limestone with no fines.

.2 Clear Stone: 19mm uniform crushed angular clear stone In accordance with OPSS.PROV 1004.

Part 3 Execution

3.1 EXAMINATION

.1 Examine synthetic turf surfacing base and perimeter conditions, with Installer present, for compliance with requirements for installation tolerances, and other conditions affecting performance of the Work.

.1 Verify substrate meets profile required.

.2 Confirm base material, compaction of substrate, permeability, and drainage system installation meets requirements.

.2 Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 SUBBASE PREPARATION

.1 General: Prepare substrates to receive surfacing products according to synthetic turf surfacing manufacturer's written instructions. Verify that substrates are sound and without high spots, ridges, holes, and depressions. Remove organic debris. Grade soil subgrade level and compact.

.2 Finish grade soil subgrade with slope between 0.5 percent and 1.0 percent toward path of site drainage.

.1 Compact subgrade in both directions with mechanical compacting equipment to achieve specified compaction at 90 percent standard Proctor.

.2 Prepare subgrade to tolerance of within 0.5 inch of design grade.

.3 Prepare subgrade within 0.25 inch in 10 feet in any direction from design grade over entire playing surface.

3.3 AGGREGATE COURSE INSTALLATION

.1 Place aggregate base course, compact by tamping with plate vibrator to 90 percent of ASTM D 1557 maximum laboratory density, and screed to depth indicated. Install 150mm base course unless otherwise indicated.

.1 Slope base course between 0.5 percent and 1.0 percent, measured from the longitudinal center of the installation towards the edges. Grade base course to tolerance of within 12mm of design grade, and with a maximum variation of 6mm in 3 metres in any direction.

3.4 SYNTHETIC TURF INSTALLATION

.1 General: Comply with synthetic turf surfacing manufacturer's written installation instructions. Install synthetic turf surfacing over area and in thickness indicated.

.2 Fall Pad: Place fall pads tightly abutted over area to receive synthetic turf surfacing. Tape seams with pad seam tape to secure pads in position prior to installing synthetic turf.

.3 Artificial Turf: Loose-lay artificial turf and allow fabric to relax for period recommended by manufacturer. Stretch carpet and attach at perimeter in accordance with approved submittals.

.4 Seaming: Form seams flat and snug, with no gaps or fraying. Remove yarns that are trapped within seams. Form seams as recommended in synthetic turf manufacturer's written instructions using manufacturer's provided or recommended materials.

.5 Attachment: Attach turf fabric to perimeter restraint system as recommended by the manufacturer.

3.5 ACTIVITY LINES AND MARKERS

.1 Install lines in accordance with approved submittals.

3.6 INSTALLATION, INFILL

.1 Mix and install infill material components in accordance with manufacturer’s requirements for approved system. Groom material and leave surface ready for use.

3.7 PROTECTION

.1 Protect completed installation from damage. Prevent traffic over system prior to acceptance by Owner.

3.8 DEMONSTRATION

.1 Instruct Owner's personnel in proper inspection and maintenance of synthetic turf surfacing. Review manufacturer’s recommended maintenance procedures and warranty terms and conditions.

END OF SECTION

Part 1 General

1.1 RELATED REQUIREMENTS

.1 Section 03 30 01 Landscape Cast In Place Concrete

.2 Section 32 13 13 Concrete Paving and Edges

1.2 SCOPE OF WORK

.1 Supply all labour, materials, methods and equipment to supply, fabricate and place fences, shown on drawings, specified herein, and as required for a complete and proper installation including;

.1 1.5 and 1.8m m Ht. Black Vinyl Chain link fence

1.3 REFERENCE STANDARDS

.1 ASTM International

.1 ASTM A53/A53M-[10] , Standard Specification for Pipe, Steel, Black and Hot-Dipped, Zinc-Coated Welded and Seamless.

.2 ASTM A90/A90M-[09] , Standard Test Method for Weight [Mass] of Coating on Iron and Steel Articles with Zinc or Zinc-Alloy Coatings.

.3 A123 / A123M - 17 Standard Specification for Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products

.4 A653/A653M-19 , Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process.

.5 ASTM C618-[08a] , Standard Specification for Coal Fly Ash and Raw or Calcined Natural Pozzolan for Use as a Mineral Admixture in Concrete.

.6 ASTM F1664-[08] , Standard Specification for Poly(Vinyl Chloride) (PVC)-Coated Steel Tension Wire Used with Chain-Link Fence.

.2 Canadian General Standards Board (CGSB)

.1 CAN/CGSB-138.1-[96] , Fabric for Chain Link Fence.

.2 CAN/CGSB-138.2-[96] , Steel Framework for Chain Link Fence.

.3 CAN/CGSB-138.3-[96] , Installation of Chain Link Fence.

.4 CAN/CGSB-138.4-[96] , Gates for Chain Link Fence.

.5 CAN/CGSB-1.181-[99] , Ready-Mixed Organic Zinc-Rich Coating.

.3 CSA Group (CSA)

.1 CSA A23.1/A23.2-[09] , Concrete Materials and Methods of Concrete Construction/Test Methods and Standard Practices for Concrete.

.2 CAN/CSA-A3000-[08] , Cementitious Materials Compendium.

.4 Master Painters Institute (MPI)

.1 Architectural Painting Specification Manual - current edition.

1.4 ACTION AND INFORMATIONAL SUBMITTALS

.1 Submit in accordance with Section 01 33 00- Submittal Procedures.

.2 Product Data:

.1 Submit manufacturer's instructions, printed product literature and data sheets for mesh, posts and gates, brackets, rails, fittings, and hardware and include product characteristics, performance criteria, physical size, finish and limitations.

.3 Shop Drawings:

.1 Submit shop drawings indicating;

.1 Show locations of fence, each gate, posts, rails, and details of gate swing direction, or other operation, hardware, and accessories.

.2 Show dimensions from property lines to all end, corner and terminator posts.

.3 Indicate materials, dimensions, sizes, weights, and finishes of components.

.4 Include plans, elevations, sections, and other required installation and operational clearances, and details of post anchorage, attachment, and bracing.

.5 Installation recommendations and instructions by manufacturer describing all details for a typical fence and gates.

1.5 DELIVERY, STORAGE AND HANDLING

.1 Deliver, store and handle materials in accordance with Section with manufacturer's written instructions.

.2 Delivery and Acceptance Requirements: deliver materials to site in original factory packaging, labelled with manufacturer's name and address.

.3 Storage and Handling Requirements:

.1 Store materials in accordance with manufacturer's recommendations.

.2 Store and protect fence and gate materials from damage.

.3 Replace defective or damaged materials with new.

1.6 PROJECT CONDITIONS

.1 Field Measurements: Verify layout information for fences and gates shown on drawings in relation to property survey and existing structures. Verify dimensions by field measurements.

Part 2 Products

2.1 MATERIALS – CHAIN LINK FENCE

.1 Concrete mixes and materials: in accordance with CSA A23.1 and Section 03 30 01 – Landscape Cast-in-Place Concrete .

.1 Compressive strength: 20 MPa minimum at 28 days.

.2 Chain-link fence fabric: to CAN/CGSB-138.1.

.1 38mm x 9ga. Mesh, zinc coated before weaving.

.2 Height of fabric: 1.5m OR 1.8m.

.3 Posts, braces and rails: to CAN/CGSB-138.2, galvanized steel pipe.

.1 Dimensions;

.1 End and straining posts: 90.0mm O.D.

.2 Line posts: 60.0mm O.D.

.3 Rails and Braces: 43.0mm O.D.

.4 Tension wire: to CAN/CGSB-138.2, galvanized steel wire, conforming to requirements of fence fabric, 6 ga.

.5 Tie wire fasteners: single strand, steel wire conforming to requirements of fence fabric, 6ga..

.6 Tension bar: to ASTM A653/A653M, 3 x 19 mm minimum galvanized steel.

.7 Gates: to CAN/CGSB-138.4.

.8 Gate frames: to ASTM A53/A53M, galvanized steel pipe, standard weight 51.0 mm outside diameter pipe for outside frame, 43.0 mm outside diameter pipe for interior bracing.

.1 Fabricate gates as indicated with electrically welded joints, and hot-dip galvanized after welding.

.2 Fasten fence fabric to gate with knuckle selvage at top.

.3 Furnish gates with galvanized malleable iron and self closing hinges, latch and latch catch with provision for padlock which can be attached and operated from either side of installed gate.

.4 Furnish double gates with and centre rest with drop bolt for closed position.

.9 Fittings and hardware: to CAN/CGSB-138.2, ductile cast iron, malleable galvanized steel or cast aluminum alloy.

.1 Tension bar bands: 3 x 20 mm minimum galvanized steel or 5 x 20 mm minimum aluminum.

.2 Post caps to provide waterproof fit, to fasten securely over posts and to carry top rail.

.3 Turnbuckles to be drop forged.

.4 Hot dipped galvanized and PVC coated

.10 Grounding rod: 16mm diameter x 3m long, copper well rod.

2.2 FINISHES

.1 Galvanizing:

.1 For chain link fabric: to CAN/CGSB-138.1 Grade 2.

.2 For pipe: 550 g/m^2 minimum to ASTM A90.

.3 For other fittings: to CAN/CSA G164-18 .

.2 Black Vinyl Coating:

.1 All mesh fabric shall be finished with black vinyl coating, 0.64 mm dry film thickness minimum, in accordance with the latest Canadian Government specifications of vinyl coated galvanized steel. Components shall be coated by thermal extrusion method, using an adhesive agent to bond the P.V.C. coating to the galvanized metal.

.3 Black Enamel Powder Coating:

.1 All posts, rails, framework fasteners, fittings hardware and caps to be black gloss enamel by powder coat application. All surfaces to be chemically cleaned and treated prior to coating with parker bondrite and chlorothene solvent or equals. Powder coating must be a polyester 2000 series, thickness of 4-5mils, oven-cured to a smooth even surface.

2.3 CONCRETE

.1 Concrete: Refer to Section 03 30 01 Landscape Cast-In-Place Concrete

2.4 GROUT

.1 Non-shrink, Non-metallic Grout: Premixed, factory-packaged, non-staining, noncorrosive, nongaseous grout complying with ASTM C1107. Provide grout, recommended in writing by manufacturer, for exterior applications.

Part 3 Execution

3.1 EXAMINATION

.1 Verification of Conditions: verify conditions of substrate previously installed under other Sections or Contracts are acceptable for fence and gate installation in accordance with manufacturer's written instructions.

.1 Visually inspect substrate.

.2 Inform Consultant of unacceptable conditions immediately upon discovery.

.3 Proceed with installation only after unacceptable conditions have been remedied.

3.2 PREPARATION

.1 Grading:

.1 Remove debris and correct ground undulations along fence line to obtain smooth uniform gradient between posts.

.1 Provide clearance between bottom of fence and ground surface of 50mm.

.2 Stake locations of fence lines, gates, and terminal posts. Do not exceed intervals of 500 ft (152.5 m) or line of sight between stakes. Indicate locations of utilities, irrigation systems, underground structures, benchmarks, and property monuments.

3.3 ERECTION OF CHAIN LINK FENCE

.1 Erect fence along lines as indicated and to CAN/CGSB-138.3.

.2 Excavate post holes to dimensions indicated.

.3 Space line posts as indicated, maximum 3m apart, measured parallel to ground surface.

.4 Space straining posts at equal intervals not to exceed 150m if distance between end or corner posts on straight continuous lengths of fence over reasonably smooth grade, is greater than 150m.

.5 Install additional straining posts at sharp changes in grade.

.6 Install corner post where change in alignment exceeds 10 degrees.

.7 Install end posts at end of fence and at buildings.

.1 Install gate posts on both sides of gate openings.

.8 Place concrete in post holes then embed posts into concrete to depths indicated, minimum 450mm depth.

.1 Ensure concrete is not above grade level.

.2 Brace to hold posts in plumb position and true to alignment and elevation until concrete has set.

.9 Install fence fabric after concrete has cured, minimum of 5 days.

.10 Install brace between end and gate posts and nearest line post, placed in centre of panel and parallel to ground surface.

.1 Install braces on both sides of corner and straining posts in similar manner.

.11 Install top and bottom rails between posts and fasten securely to posts and secure waterproof caps.

.12 Install bottom tension wire, stretch tightly and fasten securely to end, corner, gate and straining posts with turnbuckles and tension bar bands.

.13 Lay out fence fabric. Stretch tightly to tension recommended by manufacturer and fasten to end, corner, gate and straining posts with tension bar secured to post with tension bar bands spaced at 300 mm intervals.

.1 Knuckled selvedge at top and bottom.

.14 Secure fabric to top rails, line posts and bottom tension wire with tie wires at 450 mm intervals.

.1 Give tie wires minimum two twists.

.15 Nuts and bolts for fittings shall be installed with the head on the exposed side of the fence. Bolts shall be peened over to precent removal of the nut.

.16 Grind and touch up all sharp ends or edges.

.17 Provide grounding, which shall be installed by licenced electrician.

3.4 INSTALLATION OF GATES

.1 Install gate posts in accordance with manufacturer's instructions.

.2 Concrete Set Gate Posts: Set 300mm dia. sonotube in undisturbed or compacted soil to depths approximately 6 in (150 mm) deeper than frost level. Excavate deeper as required for adequate support in soft and loose soils, and for posts with heavy lateral loads. Set post bottom 36 in (914 mm) below surface when in firm, undisturbed soil. Place concrete around posts in a continuous pour, tamp for consolidation. Trowel finish around post and slope to direct water away from posts. Check each post for vertical and top alignment and maintain in position during placement and finishing operations.

.3 Install gates perfectly horizontal and levelled (at junction), plumb, and secure for full opening without interference.

.4 Attach hardware so to have the tamper-proof nuts inside the property, which will prevent unauthorized removal. Install groundset items in concrete for anchorage.

.5 Adjust hardware for smooth operation and lubricate where necessary to operate smoothly, easily, and quietly, free from binding, warp, excessive deflection, distortion, nonalignment, misplacement, disruption, or malfunction, throughout entire operational range. Confirm that latches and locks engage accurately and securely without forcing or binding.

.6 Install gate stops where indicated.

3.5 GROUNDING

.1 Fence Grounding: Install at maximum intervals of 225m by certified electrician.

3.6 TOUCH UP

.1 Clean and touch-up damaged surfaces in accordance with manufacturers recommendations to the satisfaction of the Consultant.

.1 Pre-treat damaged surfaces according to manufacturers' instructions for zinc-rich paint.

.2 Fences and Gates located within kindergarten or childcare play areas are to be free of sharp edges, including mesh, fasteners, etc. Cut back all bolts to a maximum of 6mm and ensure smooth to the touch or include an acorn caps.

3.7 CLEANING

.1 The area shall be left clean, neat and free of any debris resulting from the fence installation. Dispose of surplus material off site.

END OF SECTION

Part 1 General

1.1 RELATED DOCUMENTS

.1 Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

.1 Section Includes:

.1 Decorative metallic-coated steel tubular picket fences.

.2 Related Sections:

.1 Division 03 Section Landscape Cast-in-Place Concrete for concrete bases for posts.

.2 Division 31 Section "Earth Moving" for site excavation, fill, and backfill where decorative metal fences are located.

1.3 PERFORMANCE REQUIREMENTS

.1 Lightning-Protection System: Maximum grounding-resistance value of 25 ohms under normal dry conditions.

1.4 SUBMITTALS

.1 Product Data: For each type of product indicated.

.2 Shop Drawings: Submit shop drawings indicating;

.1 Show locations of fence , posts, rails, and details of hardware, and accessories.

.2 Show dimensions from property lines to all end, corner and terminator posts.

.3 Indicate materials, dimensions, sizes, weights, and finishes of components.

.4 Include plans, elevations, sections, and other required installation and operational clearances, and details of post anchorage, attachment, and bracing.

.5 Installation recommendations and instructions by manufacturer describing all details for a typical fence.

.6 Reviewed and Stamped installation recommendations and instructions by Professional Engineer registered in the Province of Ontario, for the installation of fences acting as Guards for retaining walls taller than 0.6m in height, as required by Ontario Building Code.

.3 Product Test Reports: Based on evaluation of comprehensive tests performed by a qualified testing agency, for decorative metallic-coated steel tubular picket fences, including finish, indicating compliance with referenced standard.

1.5 QUALITY ASSURANCE

.1 Installer Qualifications: An experienced installer who has completed installations of fences and gates similar in material, design, and extent to those indicated for this project and whose work has resulted in construction with a record of successful in-service performance

.2 Source Limitations for Fences and Gates: Obtain each color, grade, finish, type, and variety of components for fences and gates from one source with resources to provide fences and gates of consistent quality in appearance and physical properties.

1.6 WARRANTY

.1 Provide manufacturer's standard warranty against defects in materials and workmanship.

.1 Products will be free from defects in components and workmanship for a period of five (5) years from date of manufacture.

Part 2 Products

2.1 DECORATIVE METAL FENCES

.1 Product: Iron Eagle II, Elegant Eagle II as supplied by Iron Eagle Industries. T: 905-670-2558.

.2 Material: Galvalume coated steel

.3 Panel Height: 1500mm

.4 Posts: Square tubes

.1 Size: 3 by 3 inches (76 by 76 mm) schedule 40.

.2 Post Spacing: 101 inches (2565mm) on centre maximum

.5 Post Caps: Pyramid

.6 Rails: Rectangular tubes

.1 Size: 2-1/2 by 1-1/2 inches (64 by 38 mm), 16 gauge.

.7 Pickets: Square tubes.

.1 Size: ¾ inches by 1-1/2 inch (19 by 38mm), 16 gauge.

.2 Picket Spacing: 3-1/2 inches 88.9 mm) clear, maximum.

.8 Fasteners: Manufacturer's standard fasteners, bolts cut back to 6mm or shrouded.

.9 Fittings: 12 gauge stamp forged.

.10 Finish: Chromate conversion coating and electrostatically applied, thermally bonded

polyester powder coating minimum film thickness of 2.5mils

.1 Colour: Black.

2.2 MISCELLANEOUS MATERIALS

.1 Concrete: Refer to Section 03 30 01 Landscape Cast in Place Concrete.

2.3 GROUNDING MATERIALS

.1 Grounding Wire and Rods: per OPSS 609.

Part 3 Execution

3.1 EXAMINATION

.1 Examine areas and conditions, with Installer present, for compliance with requirements for site clearing, earthwork, pavement work, construction layout, and other conditions affecting performance of the Work.

.2 Do not begin installation before final grading is completed unless otherwise permitted by Consultant.

.3 Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

.1 Stake locations of fence lines and terminal posts. Do not exceed intervals of 500 feet (152.5 m) or line of sight between stakes. Indicate locations of utilities, underground structures, benchmarks, and property monuments.

3.3 DECORATIVE FENCE INSTALLATION

.1 Install fences according to manufacturer's written instructions.

.2 Install fences by setting posts as indicated and fastening rails and infill panels to posts. Cut back, peen or shroud threads of bolts after assembly to prevent removal. Nuts and Bolts for fittings shall be installed with the head on the exterior side of the enclosure

.3 Lay out post locations and obtain the approval of the Landscape Architect before proceeding.

.4 Excavate post holes for decorative fences 1400mm deep and 250mm diameter. Hand excavate around all buried utility lines. Bases shall be minimum 250mm diameter x 1275mm deep, as shown on details. Set top of footing 75mm below finished grade, slope away from posts.

.5 Set fence posts upright in post holes, fill with concrete to within 75mm below finished grade. Allow minimum 14 days for curing. All concrete shall be ready mix minimum 32MPa at 28 days.

.6 All metal fences shall be installed rigid, plumb, straight and true to line as shown on the drawings or directed on the site.

.7 The Contractor shall be responsible for making good all surfaces disturbed by the installation of this work.

3.4 FENCES ACTING AS GUARD RAILINGS

.1 Fences to be installed as guards for retaining walls shall be installed as per O.B.C 3.3.1.17, 4.1.5.15 and 4.4.3.1. Install as per methods identified on approved shop drawings sealed by professional engineer registered in the Province of Ontario.

3.5 GROUNDING AND BONDING

.1 Fence Grounding: Install at maximum intervals of 225m by certified electrician.

3.6 TOUCH UP

.1 Clean and touch-up damaged surfaces in accordance with manufacturers recommendations to the satisfaction of the Consultant.

3.7 CLEANING

.1 The area shall be left clean, neat and free of any debris resulting from the fence installation. Dispose of surplus material off site.

END OF SECTION

Part 1 General

1.1 RELATED REQUIREMENTS

.1 Section 32 13 13 Concrete Paving and Edges

1.2 ACTION AND INFORMATIONAL SUBMITTALS

.1 Provide in accordance with Section 01 33 00- Submittal Procedures.

.2 Product Data:

.1 Provide manufacturer's instructions, printed product literature and data sheets for site furniture and include product characteristics, performance criteria, physical size, finish and limitations.

.3 Shop Drawings:

.1 Submit shop drawings indicating dimensions, sizes, assembly, anchorage and installation details for each furnishing specified.

1.3 CLOSEOUT SUBMITTALS

.1 Provide maintenance data for care and cleaning of site furnishings for incorporation into manual specified in Section 01 78 00- Closeout Submittals.

1.4 DELIVERY, STORAGE AND HANDLING

.1 Deliver, store and handle materials in accordance with Section with manufacturer's written instructions.

.2 Delivery and Acceptance Requirements: deliver materials to site in original factory packaging, labelled with manufacturer's name and address.

.3 Storage and Handling Requirements:

.1 Store materials off ground and in accordance with manufacturer's recommendations in clean, dry, well-ventilated area.

.2 Store and protect furnishings from nicks, scratches, and blemishes.

.3 Replace defective or damaged materials with new.

Part 2 Products

2.1 BICYCLE RACK

.1 Product:

.1 The Single Arch bike rack, as manufactured by GreenSpoke and supplied by ABC Recreation. (Contact: Lyden Lockhart, T: 416 949-7676)

.2 Approved equivalent.

.2 Mount: in-ground direct bury

.3 Finish: Powdercoat, Black

.4 Quantity: 50

2.2 ANTI-SKATE HARDWARE

.1 Stainless Steel Flat Bar with 0.75” Beveled Corner, FB.75B, Skateblock as manufactured by Ravensforge (T: 1-800-743-3490)

.2 Quantity: as required as shown on drawing details.

2.3 DETECTABLE WARNING PLATES

.1 Product:

.1 Advantage ADV-CI-2424 as manufactured by Kinesik Engineer Products.

.2 Approved equivalent.

.2 Basic Construction Material: Cast iron

.3 Dimensions: 610x610mm

.4 Finish: Onyx Black

.5 Quantity: As Required.

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 exterior site furnishing installation in accordance with manufacturer's written instructions.

.1 Visually inspect substrate in presence of Consultant.

.2 Inform Consultant of unacceptable conditions immediately upon discovery.

.3 Proceed with installation only after unacceptable conditions have been remedied.

3.2 PREPARATION

.1 Locate and protect utility lines.

.2 Notify and acquire written acknowledgement from utility authorities before beginning installation Work

3.3 INSTALLATION

.1 Assemble furnishings in accordance with manufacturer's written recommendations.

.2 Install anchored, true, level, and plumb.

.3 Touch-up damaged finishes to approval of Consultant, by method as recommended by manufacturer.

3.4 CLEANING

.1 Progress Cleaning: clean in accordance with Section 01 74 11- Cleaning.

.1 Leave Work area clean at end of each day.

.2 Final Cleaning: upon completion remove surplus materials, rubbish, tools and equipment in accordance with Section 01 74 11- Cleaning.

3.5 PROTECTION

.1 Protect installed products and components from damage during construction.

.2 Repair damage to adjacent materials caused by site furnishings installation.

END OF SECTION

Part 1 General

1.1 RELATED REQUIREMENTS

.1 Section 32 91 19 Topsoil and Finish Grading

.2 Section 32 92 23 Sodding

.3 Section 32 93 10 Trees, Shrubs and Groundcover Planting

1.2 SCOPE OF WORK

.1 The Landscape Contractor shall provide a landscape maintenance services as specified herein for all sodded areas and plant material, for a warranty period of two (2) years from date of acceptance by consultant for sod and planting material.

1.3 DELIVERY AND STORAGE

.1 As per Section 32 92 23 Sodding and 32 93 10 Trees, Shrubs and Groundcover Planting.

.2 Obtain approval from Maintenance Supervisor of Grounds for Storage of maintenance materials on site.

.3 Materials which include chemicals must be stored in a special approved area away from school site. Safety data sheets must be submitted for Chemicals, in accordance with Division 1.

1.4 SAFETY DATA SHEETS

.1 The Contractor shall submit material and safety data sheets to the Owner prior to the commencing the application of:

.1 Fertilizers.

Part 2 Products

2.1 MATERIALS

.1 Topsoil: in accordance with Section 32 91 19 Topsoil and Finish Grading

.2 Peatmoss: in accordance with Section 32 91 19 Topsoil and Finish Grading

.3 Sand: in accordance with Section 32 91 19 Topsoil and Finish Grading

.4 Limestone: in accordance with Section 32 91 19 Topsoil and Finish Grading

.5 Fertilizer:

.1 4:1:2 ratio fertilizer with minimum 40% slow release at a rate of 0.5kg nitrogen/100$m^{2.}$

.2 Liquid fertilizer of type specified for trees with a minimum 4:2:3 ratio (27-10-13).

.6 Bonemeal: raw bonemeal, finely ground with minimum 3% nitrogen and 20% phosphoric acid.

.7 Water: potable and free of impurities that would inhibit plant growth.

.8 Sod: in accordance with Section 32 92 23 Sodding

.9 Mulch: in accordance with Section 32 93 10 Trees, Shrubs and Groundcover Planting.

.10 Replacement Stock: as specified for original plantings in accordance with Section 32 93 10 Trees, Shrubs and Groundcover Planting.

Part 3 Execution

3.1 GENERAL WORKMANSHIP

.1 Program timing of operations to growth, weather conditions and use of site.

.2 Notify Maintenance Supervisor of Grounds at least 7 days in advance of start of operations.

.3 Do each operation continuously and complete within a reasonable time period.

.4 Supply materials, topsoil, planting soil, mulch, fertilizer, replacement of tree stakes, wire and plant material as specified in the relevant sections of these specifications.

.5 Obtain acceptance in writing from Maintenance Supervisor of Grounds with detailed description of work completed, prior to submission of progress claims.

.6 Notify Maintenance Supervisor of Grounds immediately of damage incurred by pest, disease, mechanical or vandalism.

3.2 SEASONAL MAINTENANCE

.1 Spring Maintenance:

.1 Sodded Areas:

.1 Rake sodded areas and remove dead vegetation, leaves and debris. Do heavy raking with flexible grass rake on areas with “snow mold”.

.2 Roll lightly areas where sodded areas have lifted due to frost action.

.3 Aerate areas where soil has been compacted through pedestrian traffic or other causes. Use aerating equipment which extracts earth plugs from soil. Re-sod areas where turf has been killed by pedestrian traffic or salt damage.

.2 Planting Beds:

.1 Clean planting beds of debris and dead plant material. Loosen and cultivate soil lightly without disturbing roots below surface.

.2 Where mulching material used in planting beds, remove temporarily, material that has not been decomposed and mix decomposed mulch with

planting soil. Replace mulching material. Supply and add sufficient material of equal quality to provide covering of 75mm.

.2 Winter Preparation:

.1 Rake and assemble leaves after they have been shed by trees.

.2 Clean out and water planting beds prior to freeze-up.

3.3 SOD MAINTENANCE

.1 Water sodded areas at weekly intervals to obtain optimum soil moisture conditions to a depth of 100mm.

.2 Repair: Repair and resod dead or bare spots to satisfaction of Consultant.

.1 Resodding:

.1 Remove dead sod, weeds and debris from area to be re-sodded. Loosen top layer to a depth of 150-200mm by discing or roto-tilling. Prepare smooth, loose surface for laying sod.

.2 Add Topsoil and re-grade low spots.

.3 Apply a 4:1:2 ratio fertilizer at a rate of 0.5kg nitrogen/100m^2. Rake into top layer of soil.

.4 Use sod as specified.

.5 Lay sod with sections closely butted, without overlapping gaps, smooth and even with adjoining areas. Stagger sod joints when sodding large areas. Roll lightly and tamp. Water to obtain moisture penetration with 75 to 100mm. Continue watering at intervals to maintain sufficient plant growth.

.6 Keep grass cut at a height of 65mm.

.3 Aerating:

.1 Select time during early spring when soil is sufficiently dry to allow breaking up of soil particles.

.2 Clean sodded areas to be aerated and mow grass to a height of 50mm.

.3 Aerate sodded areas using aerating equipment which extracts earth plugs and deposits to location of extraction, minimum 100mm deep and spaced a maximum of 120mm on centres.

.4 Drag heavy mat over sodded areas or rake to break up plugs and spread resulting soil evenly through sodded areas.

.4 Fertilizing:

.1 Apply a 4:1:2 ratio fertilizer with minimum 40% slow release at a rate of 0.5kg nitrogen/100m^2. Apply in early spring as soon as frost is out of ground.

.2 Make supplementary application of 0.5kg nitrogen/100m2 towards end of August.

.3 Use calibration to ensure specified rate is spread evenly.

.4 Water immediately after fertilizing to obtain moisture penetration of 40-50mm.

.5 Rectify uneven spreading as soon as it becomes apparent. Spread additional fertilizer over areas affected or rake out excess application.

.5 Cut Grass and remove clippings to height as follows:

.1 50 mm during normal growing conditions.

.2 Cut grass at 2 week intervals, or at intervals so that approximately one third of growth is removed in single cut.

.3 Fertilize areas in accordance with fertilizing program as recommended by manufacturer. Spread half of required amount of fertilizer in one direction and remainder at right angles and water in well.

.4 Eliminate weeds by hand means to extent acceptable to Consultant.

3.4 PLANTING BED MAINTENANCE

.1 Watering:

.1 Maintain soil moisture conditions for optimum growth and health of plant material without causing erosion.

.2 The Owner will supply water required for watering purposes. Become familiar with location of water supply, water outlets and/or pumping equipment required.

.3 Supply equipment such as pumps, portable sprinkler systems, tank trucks, hose and sprinklers required for watering operations.

.4 Apply sufficient water per application to obtain moisture penetration of 75 to 100mm.

.5 Apply water in soft spray to avoid "packing" of soil.

.6 Move sprinklers as required to avoid running of water and return to those areas until moisture penetration has been reached.

.7 Do not impede use of sidewalks and other paved areas.

.2 Reform damaged watering saucers.

.3 Weeding:

.1 Remove weeds monthly.

.2 Weeds are to be hand pulled.

.4 Replace or respread damaged, missing or disturbed mulch.

.5 For non-mulched areas, cultivate monthly to keep top layer of soil friable.

.6 Pest and disease control:

.1 Cultivate whenever required to keep top layer of soil, loose, friable, and free from weeds. Any operation must be continuous without interruption.

.2 Remove weeds including their roots.

.3 Take care not to damage roots of shrubs. Use small hand tools for closely planted shrubs.

.4 Collect and dispose of paper and refuse. Remove dead plants, leaves, branches, and seed pods.

.5 Clean, by hand, areas that are covered with mulch.

.7 Fertilizer:

.1 Apply ground injection of a liquid fertilizer of type specified for trees with a minimum 4:2:3 ratio (27-10-13) to be applied in November or April.

.2 Mix 15kg/100m2 of bonemeal in top 200mm.

.8 Pruning:

.1 Prune only to remove dead, broken or hazardous branches from plant material, unless otherwise directed by Owner or Consultant

.2 Prune Trees and Shrubs according to accepted horticulture practices to International Arborist Society pruning standards.

.9 Keep trunk protection and tree supports in proper repair and adjustment.

.10 Level watering saucers at end of warranty period.

.11 Remove and replace dead plants and plants not in healthy and vigorous growing condition. Make replacements in same manner as specified for original plantings.

.12 Submit monthly written reports to Consultant identifying:

.1 Maintenance work carried out.

.2 Development and condition of plant material.

.3 Preventative or corrective measures required which are outside Contractor's responsibility.

3.5 CLEANING

.1 At the end of the maintenance warranty period, remove all tree protection, stakes and wires, except those around trees which are not self-supporting replacement stock.

Part 1 GENERAL

1.1 RELATED REQUIREMENTS

.1 Section 32 92 23 Sodding

.2 Section 32 93 10 Trees, Shrubs and Groundcover Planting

1.2 SCOPE

.1 This section addresses the labour, materials, tools, services and equipment necessary for the supply and installation of topsoil and planting soil.

.2 Provide sufficient topsoil for work of this project. Amend suitable existing site topsoil for reuse or import sufficient topsoil to provide depths as specified herein, and remove any excess topsoil from site after final grading.

1.3 REFERENCE STANDARDS

.1 Agriculture and Agri-Food Canada

.1 The Canadian System of Soil Classification, Third Edition, 1998.

.2 Canadian Council of Ministers of the Environment

.1 PN1340-[2005] , Guidelines for Compost Quality.

1.4 DEFINITIONS

.1 Compost:

.1 Mixture of soil and decomposing organic matter used as fertilizer, mulch, or soil conditioner.

.2 Compost is processed organic matter containing 40% or more organic matter as determined by Walkley-Black or Loss On Ignition (LOI) test.

.3 Product must be sufficiently decomposed (i.e. stable) so that any further decomposition does not adversely affect plant growth (C:N ratio below (25) (50)), and contain no toxic or growth inhibiting contaminates.

.4 Composed bio-solids to: CCME Guidelines for Compost Quality, Category (A).

1.5 ACTION AND INFORMATIONAL SUBMITTALS

.1 Provide submittals in accordance with Section 01 33 00- Submittal Procedures.

.2 Quality control submittals:

.1 Soil testing: submit certified test reports showing compliance with specified performance characteristics and physical properties as described in PART 2 - SOURCE QUALITY CONTROL.

.2 Certificates: submit product certificates signed by manufacturer certifying materials comply with specified performance characteristics and criteria and physical requirements

Part 2 PRODUCTS

2.1 TOPSOIL

.1 Topsoil for sodded areas and base soil for planting beds: mixture of particulates, micro organisms and organic matter which provides suitable medium for supporting intended plant growth.

.1 Imported Topsoil:

.1 Soil texture based on The Canadian System of Soil Classification, to consist of 45 % sand, 35% silt and 20 % clay, and contain 5 % organic matter by weight.

.2 Imported topsoils or soil blends designed to serve as topsoil may not include the following:

.1 Soils mined from lands with an agricultural conservation easement as defined by the Ontario Ministry of Agriculture, Food and Rural Affairs.

.2 Soils mined from other greenfield sites, unless those soils are a by-product of a construction process.

.2 Native topsoil:

.1 To be amended as per analysis report recommendations to ensure topsoil is within typical guideline range and is suitable for intended use.

.3 Contain no toxic elements or growth inhibiting materials.

.4 Finished surface free from:

.1 Debris and stones over 50 mm diameter.

.2 Course vegetative material, 10 mm diameter and 100 mm length, occupying more than 2% of soil volume.

.5 Consistency: friable when moist.

2.2 PLANTING SOIL

.1 Planting Soil: pH range of 6.5 to 7.5, mixture to be 50% topsoil, 25% peat moss, 25% well rotted manure, and 500g bonemeal per cubic metre of planting soil; screened and free of stones 1 inch or larger in any dimension and other extraneous materials harmful to plant growth.

.2 Clean soil of roots, plants, sod, stones, clay lumps, and other extraneous materials harmful to plant growth.

2.3 SOIL AMENDMENTS

.1 Fertilizer:

.1 Fertility: major soil nutrients present in following amounts:

.2 Nitrogen (N): [20] to [40] micrograms of available N per gram of topsoil.

.3 Phosphorus (P): [40] to [50] micrograms of phosphate per gram of topsoil.

.4 Potassium (K): [75] to [110] micrograms of potassium per gram of topsoil.

.5 Calcium, magnesium, sulphur and micro-nutrients present in balanced ratios to support germination and/or establishment of intended vegetation.

.6 Ph value: 6.5 to 7.5 .

.2 Peatmoss:

.1 Derived from partially decomposed species of Sphagnum Mosses.

.2 Elastic and homogeneous, brown in colour.

.3 Free of wood and deleterious material which could prohibit growth.

.4 Shredded particle minimum size: [5] mm.

.3 Sand: washed coarse silica sand, medium to course textured.

.4 Organic matter: compost Category A, in accordance with CCME PN1340 , unprocessed organic matter, such as rotted manure, hay, straw, bark residue or sawdust, meeting the organic matter, stability and contaminant requirements.

.5 Use composts meeting Category B requirements for land fill reclamation and large scale industrial applications.

.6 Limestone:

.1 Ground agricultural limestone.

.2 Gradation requirements: percentage passing by weight, 90% passing 1.0 mm sieve, 50% passing 0.125 mm sieve.

.7 Fertilizer: industry accepted standard medium containing nitrogen, phosphorous, potassium and other micro-nutrients suitable to specific plant species or application or defined by soil test.

2.4 SOURCE QUALITY CONTROL

.1 Advise Consultant of sources of topsoil to be utilized with sufficient lead time for testing.

.2 Soil testing to be completed by recognized testing facility for pH, BpH, Total Salts, Organic Matter, Phosphorus, Potassium, Magnesium, Calcium, Sodium, Chloride,

sodium absorption ratio, cation exchange capacity, Texture (% Sand, % Silt, % Clay), as well as recommended amendments to ensure topsoil is suitable for intended use.

.3 Testing of topsoil will be carried out by SGS Agrifood Laboratories (T:519-837-1242).

.1 Soil sampling, testing and analysis to be in accordance with Provincial standards.

.2 Cost for testing to be included in Contract.

.4 Contractor is responsible for amendments to topsoil, as recommended within testing report to supply viable topsoil, at no additional cost to Owner.

Part 3 EXECUTION

3.1 PREPARATION OF EXISTING GRADE

.1 Verify that grades are correct.

.1 If discrepancies occur, notify Consultant and do not commence work until instructed by Consultant.

.2 Grade soil, eliminating uneven areas and low spots, ensuring positive drainage.

.3 Remove debris, roots, branches, stones in excess of 50 mm diameter and other deleterious materials.

.1 Remove soil contaminated with calcium chloride, toxic materials and petroleum products.

.2 Remove debris which protrudes more than 75 mm above surface.

.3 Dispose of removed material off site.

.4 Cultivate entire area which is to receive topsoil to minimum depth of 100 mm.

.1 Cross cultivate those areas where equipment used for hauling and spreading has compacted soil.

3.2 PLACING AND SPREADING OF TOPSOIL / PLANTING SOIL

.1 Place topsoil after Consultant has accepted subgrade.

.2 Spread topsoil in uniform layers not exceeding 150 mm.

.3 For sodded areas keep topsoil 15 mm below finished grade.

.4 Spread topsoil or planting soil to following minimum depths after settlement.

.1 200 mm for sodded areas.

.2 300 mm for sodded play fields.

.3 400 mm planting soil for perennial beds.

.4 600 mm planting soil for shrub beds.

.5 Minimum soil volume as required by L205 Tree Canopy Plan.

.5 Manually spread topsoil/planting soil around trees, shrubs and obstacles.

3.3 SOIL AMENDMENTS

.1 Apply and thoroughly mix soil amendments into full specified depth of topsoil at rates recommended within soil testing reports.

3.4 FINISH GRADING

.1 Grade to eliminate rough spots and low areas and ensure positive drainage.

.1 Prepare loose friable bed by means of cultivation and subsequent raking.

.2 Leave surfaces smooth, uniform and firm against deep foot printing.

3.5 ACCEPTANCE

.1 Consultant will inspect and test topsoil in place and determine acceptance of material, depth of topsoil and finish grading.

3.6 SURPLUS MATERIAL

.1 Dispose of materials except topsoil not required off site at no additional cost to Owner.

3.7 CLEANING

.1 Upon completion of installation, remove surplus materials, rubbish, tools and equipment barriers.

END OF SECTION

Part 1 General

1.1 RELATED REQUIREMENTS

.1 Section 23 91 19 Topsoil and Finish Grading

1.2 ADMINISTRATIVE REQUIREMENTS

.1 Scheduling:

.1 Schedule sod laying to coincide with preparation of soil surface.

.2 Schedule sod installation when frost is not present in ground.

1.3 ACTION AND INFORMATIONAL SUBMITTALS

.1 Submit in accordance with Section 01 33 00- Submittal Procedures.

.2 Samples.

.1 Submit:

.1 Sod for each type specified.

.1 Install approved samples in1 square metre mock-ups and maintain in accordance with maintenance requirements during establishment period.

.2 Bio-degradable geotextile fabric.

.3 [0.5] kg container of each type of fertilizer used.

.2 Obtain approval of samples by Consultant.

.3 Certificates: submit product certificates signed by manufacturer certifying materials comply with specified performance characteristics and criteria and physical requirements of seed mix, seed purity, and sod quality.

.4 Test Reports: submit certified test reports showing compliance with specified performance characteristics and physical properties of seed mix, seed purity, and sod quality.

1.4 QUALITY ASSURANCE

.1 Qualifications:

.1 Landscape Contractor: to be a Member in Good Standing of Landscape Ontario.

.2 Landscape Planting Supervisor: Landscape Industry Certified Technician with Softscape Installation designation.

.3 Landscape Maintenance Supervisor: Landscape Industry Certified Technician with Turf Maintenance designation.

1.5 DELIVERY, STORAGE AND HANDLING

.1 Deliver, store and handle materials in accordance with Section with manufacturer's written instructions.

.2 Delivery and Acceptance Requirements: deliver materials to site in original factory packaging, labelled with manufacturer's name and address.

.3 Storage and Handling Requirements:

.1 Store materials in accordance with supplier's recommendations.

.2 Replace defective or damaged materials with new.

Part 2 Products

2.1 MATERIALS

.1 Number One Turf Grass Nursery Sod: sod that has been especially sown and cultivated in nursery fields as turf grass crop.

.1 Turf Grass Nursery Sod types:

.1 Number One Kentucky Bluegrass Sod - Fescue Sod (General Site): Nursery Sod grown solely from seed mixture of cultivars of Kentucky Bluegrass and Chewing Fescue or Creeping Red Fescue, containing not less than 40% Kentucky Bluegrass cultivars and 30% Chewing Fescue or Creeping Red Fescue cultivars .

.2 Turf Grass Nursery Sod quality:

.1 Not more than 1 broadleaf weed and up to 1% native grasses per 40 square metres.

.2 Density of sod sufficient so that no soil is visible from height of 1500 mm when mown to height of 50 mm.

.3 Mowing height limit: 35 to 65 mm.

.4 Soil portion of sod: 6 to 15 mm in thickness.

.2 Commercial Grade Turf Grass Nursery:

.1 Mow sod at height directed by Consultant within 36 hours prior to lifting, and remove clippings.

.2 Not more than 5 broadleaf weeds and up to 20% native grasses per 40 square metres.

.3 Sod establishment support:

.1 Geotextile fabric: biodegradable, 25mm square mesh

.2 Wooden pegs: 17 x 8 x 200 mm.

.3 Biodegradable starch pegs: 17 x 8 x 200 mm.

.4 Water:

.1 Potable.

.5 Fertilizer:

.1 To Canada "Fertilizers Act" and Fertilizers Regulations.

.2 Complete, synthetic, slow release with 65 % of nitrogen content in water-insoluble form.

Part 3 Execution

3.1 INSTALLERS

.1 Use installers who are Member in Good Standing of Landscape Ontario.

3.2 EXAMINATION

.1 Verification of Conditions: verify that conditions of substrate previously installed under other Sections or Contracts are acceptable for sod installation in accordance with manufacturer's written instructions.

.1 Visually inspect substrate.

.2 Inform Consultant of unacceptable conditions immediately upon discovery.

.3 Proceed with installation only after unacceptable conditions have been remedied.

3.3 PREPARATION

.1 Verify that grades are correct and prepared in accordance with Section 32 91 19 Topsoil and Finish Grading. If discrepancies occur, notify Consultant and commence work when instructed by Consultant.

.2 Do not perform work under adverse field conditions such as frozen soil, excessively wet soil or soil covered with snow, ice, or standing water.

.3 Fine grade surface free of humps and hollows to smooth, even grade, to tolerance of plus or minus 15mm, surface to drain naturally.

.4 Remove and dispose of weeds; debris; stones 50 mm in diameter and larger; soil contaminated by oil, gasoline and other deleterious materials; off site.

3.4 SOD PLACEMENT

.1 Ensure sod placement is done under supervision of certified Landscape Planting Supervisor.

.2 Lay sod within 24 hours of being lifted if air temperature exceeds 20 degrees C.

.3 Lay sod sections in rows, joints staggered. Butt sections closely without overlapping or leaving gaps between sections. Cut out irregular or thin sections with sharp implements.

.4 Provide close contact between sod and soil by light rolling. Use of heavy roller to correct irregularities in grade is not permitted.

3.5 SOD PLACEMENT ON SLOPES AND PEGGING

.1 Install and secure geotextile fabric in areas indicated, in accordance with manufacturer's instructions.

.2 Start laying sod at bottom of slopes.

.3 Peg sod on slopes steeper than 3 horizontal to 1 vertical, within 1 m of catch basins and within 1 m of drainage channels and ditches to following pattern:

- .1 100 mm below top edge at 200 mm on centre for first sod sections along contours of slopes.
- .2 Not less than 3 pegs per square metre.
- .3 Not less than 6 pegs per square metre in drainage structures. Adjust pattern as directed by Consultant.
- .4 Drive pegs to 20 mm above soil surface of sod sections.

3.6 CLEANING

.1 Leave Work area clean at end of each day.

.2 Keep pavement and area adjacent to site clean and free from mud, dirt, and debris at all times.

3.7 PROTECTION BARRIERS

.1 Protect newly sodded areas from deterioration with temporary chain link fencing as directed by Consultant.

.2 Remove protection as directed by Consultant, minimum 4 weeks after installation.

3.8 MAINTENANCE DURING ESTABLISHMENT PERIOD

.1 Perform following operations from time of installation until acceptance.

- .1 Water sodded areas in sufficient quantities and at frequency required to maintain optimum soil moisture condition to depth of 100 mm.
- .2 Cut grass to 50 mm when or prior to it reaching height of 75 mm.
- .3 Maintain sodded areas weed free, 95%.
- .4 Fertilize areas in accordance with manufacturer recommended fertilizing program. Spread half of required amount of fertilizer in one direction and remainder at right angles and water in well.
- .5 Temporary barriers or signage to be maintained where required to protect newly established sod.

3.9 ACCEPTANCE

.1 Sodded areas will be accepted by Consultant provided that:

- .1 Sodded areas are properly established.
- .2 Sod is free of bare and dead spots.

.3 No surface soil is visible from height of 1500 mm when grass has been cut to height of 50 mm.

.4 Sodded areas have been cut minimum 2 times prior to acceptance.

.2 Areas sodded in fall will be accepted in following spring one month after start of growing season provided acceptance conditions are fulfilled.

.3 When environmental conditions allow, all sodded areas showing shrinkage cracks shall be top-dressed and seeded with a seed mix matching the original.

END OF SECTION

Part 1 General

1.1 RELATED REQUIREMENTS

.1 Section 32 91 19 Topsoil and Finish Grading

.2 Section 32 90 00 Landscape Maintenance

1.2 REFERENCE STANDARDS

.1 Agriculture and Agri-Food Canada (AAFC).

.1 Plant Hardiness Zones in Canada-[2000] .

.2 Canadian Nursery Landscape Association (CNLA)

.1 Canadian Standards for Nursery Stock-[2006] .

1.3 DEFINITIONS

.1 Mycorrhiza: association between fungus and roots of plants. This symbiosis, enhances plant establishment in newly landscaped and imported soils.

1.4 ADMINISTRATIVE REQUIREMENTS

.1 Scheduling: obtain approval from Consultant of schedule 7 days in advance of shipment of plant material.

.2 Schedule to include:

.1 Quantity and type of plant material.

.2 Shipping dates.

.3 Arrival dates on site.

.4 Planting Dates.

1.5 ACTION AND INFORMATIONAL SUBMITTALS

.1 Product Data:

.1 Submit manufacturer's instructions, printed product literature and data sheets for [trees, shrubs, ground cover, fertilizer, mycorrhiza, anti-desiccant, anchoring equipment, and mulch] and include product characteristics, performance criteria, physical size, finish and limitations.

.2 Samples:

.1 Submit samples of mulch.

1.6 QUALITY ASSURANCE

.1 Qualifications:

.1 Landscape Contractor: to be a Member in Good Standing of Landscape Ontario.

.2 Landscape Planting Supervisor: Landscape Industry Certified Technician with Softscape Installation designation.

.3 Landscape Maintenance Supervisor: Landscape Industry Certified Technician with Ornamental Maintenance designation.

1.7 DELIVERY, STORAGE AND HANDLING

.1 Delivery and Acceptance Requirements: deliver materials to site in original factory packaging, labelled with manufacturer's name and address.

.1 Protect plant material from frost, excessive heat, wind and sun during delivery.

.2 Protect plant material from damage during transportation:

.1 Delivery distance is less than 30 km and vehicle travels at speeds under 80 km/h, tie tarpaulins around plants or over vehicle box.

.2 Delivery distance exceeds 30 km or vehicle travels at speeds over 80 km/h, use enclosed vehicle where practical.

.3 Protect foliage and root balls using anti-desiccants and tarpaulins, where use of enclosed vehicle is impractical due to size and weight of plant material.

.2 Storage and Handling Requirements:

.1 Immediately store and protect plant material which will not be installed within on working day in accordance with supplier's written recommendations and after arrival at site.

.2 Protect stored plant material from frost, wind and sun and as follows:

.1 For bare root plant material, preserve moisture around roots by heeling-in or burying roots in topsoil and watering to full depth of root zone.

.2 For pots and containers, maintain moisture level in containers.

.3 For balled and burlapped and wire basket root balls, place to protect branches from damage. Maintain moisture level in root zones.

.3 Store and manage hazardous materials in accordance with manufacturer's written instructions.

1.8 WARRANTY

.1 Plant material as itemized on plant list to include the 12 months warranty period from time of acceptance. Plant material that is planted after leaf drop will be reviewed for acceptance the following spring, after leaf-out.

.2 Contractor hereby warrants that plant material as itemized on plant list will remain free of defects, in healthy and vigorous growing condition, for 1 full growing season, providing adequate maintenance has been provided.

.3 End-of-warranty inspection will be conducted by Consultant.

.4 Consultant reserves the right to extend Contractor's warranty responsibilities for an additional one year if, at end of initial warranty period, leaf development and growth is not sufficient to ensure future survival.

Part 2 Products

2.1 PLANT MATERIAL

.1 Type of root preparation, sizing, grading and quality: comply to Canadian Standards for Nursery Stock.

- .1 Source of plant material: grown in Zone 5
- .2 Plant material must be planted in zone specified as appropriate for its species.
- .3 Plant material in location appropriate for its species.

.2 Plant material: free of disease, insects, defects or injuries and structurally sound with strong fibrous root system.

.3 Trees: with straight trunks, well and characteristically branched for species.

.4 Bare root stock: nursery grown, in dormant stage, not balled and burlapped or container grown.

2.2 WATER

.1 Potable and free of impurities that would inhibit plant growth.

2.3 STAKES

.1 Wood, pointed one end, 50 x 38 x 2400 mm

2.4 GUYING WIRE

.1 Type 2: Green Arbortie or equivalent, secured to stake with 1” galvanized roofing nails.

2.5 TRUNK PROTECTION

.1 Plastic: flexible plastic, 100mm diameter, 450mm long

2.6 MULCH

.1 Shredded wood: varying in size from 25 to 125 mm in length, from cedar trees.

2.7 FERTILIZER

.1 Synthetic commercial type as recommended by manufacturer or soil test report.

- .1 Ensure new root growth is in contact with mycorrhiza.
- .2 Use mycorrhiza as recommended by manufacturer's written recommendations.

2.8 ANTI-DESICCANT

.1 Wax-like emulsion to provide film over plant surfaces reducing evaporation but permeable enough to permit transpiration.

2.9 FLAGGING TAPE

.1 Fluorescent, orange

2.10 SOURCE QUALITY CONTROL

.1 Obtain approval from Consultant of plant material prior to planting.

2.11 ADDITIONAL PLANT MATERIAL QUALIFICATIONS

.1 Plant material obtained from areas with milder climatic conditions from those of site acceptable only when moved to site prior to the breaking of buds in their original location and heeled-in, in a protected area until conditions suitable for planting.

.2 Use trees and shrubs must have been root pruned regularly, but not later than one growing season prior to arrival on site.

.3 Cold storage: written request and approval required for plant material which has been held in cold storage.

.4 Container-grown stock: acceptable if containers large enough for root development. Shrubs must have grown in container for minimum of one growing season but not longer than two. Root system must be able to "hold" soil when removed from container. Plants that have become root bound are not acceptable. Container stock must have been fertilized with slow releasing fertilizer.

.5 Balled and burlapped: coniferous and broad-leafed evergreens over 500mm. tall must be dug with soil ball. Deciduous trees in excess of 3m height must have been dug with large ball. Root balls must include 75% of fibrous and feeder root system. This excludes use of native trees grown in light sandy or rocky soil. Secure root balls with burlap and heavy twine, rope or a wire basket.

.6 Collected plant material: will not be permitted.

.7 Substitutions to plant material as indicated on planting plan not permitted unless written approval has been obtained as to type, variety and size. Plant substitutions must be of similar species and of equal size as those originally specified.

Part 3 Execution

3.1 EXAMINATION

.1 Verification of Conditions: verify conditions of substrate previously installed under other Sections or Contracts are acceptable for planting installation in accordance with manufacturer's written instructions.

.1 Visually inspect substrate.

.2 Inform Consultant of unacceptable conditions immediately upon discovery.

.3 Proceed with installation only after unacceptable conditions have been remedied.

3.2 PRE-PLANTING PREPARATION

.1 Proceed only after receipt of written acceptability of plant material from Consultant.

.2 Remove damaged roots and branches from plant material.

.3 Apply anti-desiccant to conifers and deciduous trees in leaf in accordance with manufacturer's instructions.

.4 Locate and protect utility lines.

.5 Notify and acquire written acknowledgement from utility authorities before beginning excavation of planting pits for trees and shrubs.

3.3 EXCAVATION AND PREPARATION OF PLANTING BEDS

.1 Preparation of planting beds in accordance with Section 32 91 19- Topsoil and Finish Grading.

.2 For individual planting holes:

.1 Stake out location and obtain approval from Consultant prior to excavating.

.2 Excavate to depth and width as indicated. All pits and beds shall be shaped and prepared as to allow for free drainage from the excavation.

.3 Scarify subgrade surfaces sides of planting hole to a depth of 75mm in areas where planting soil will be placed to produce an even, loose textured surface, free from line weeds, stones, roots, branches and similar materials larger than 50mm.

.4 Dispose of surplus excavated materials off-site.

.5 Remove water which enters excavations prior to planting. Notify Consultant if water source is ground water.

.6 Prevent freezing of bottom of plant pits.

.7 Excavate plant pits to receive frozen root balls while soil is unfrozen, and mulch with straw to protect from freezing until trees are planted.

3.4 PLANTING

.1 Planting shall be done during periods suitable with respect to weather conditions and locally accepted practice.

.2 Handle plants carefully, supporting entire plant while moving.

.3 For bare root stock, place 75 mm backfill soil in bottom of hole.

.1 Plant trees and shrubs with roots placed straight out in hole.

.4 For jute burlapped root balls, cut away top one third of wrapping and wire basket without damaging root ball.

.1 Do not pull burlap or rope from under root ball.

.5 For container stock or root balls in non-degradable wrapping, remove entire container or wrapping without damaging root ball.

.6 Plant vertically in locations as indicated.

.1 Orient plant material to give best appearance in relation to structure, roads and walks and to the approval of Consultant.

.2 Tag specimen trees (over 75mm caliper) in the nursery and install with same north-south orientation on site

.7 For trees and shrubs:

.1 Backfill soil in 150 mm lifts.

.1 Tamp each lift to eliminate air pockets.

.2 When two thirds of depth of planting pit has been backfilled, fill remaining space with water.

.3 After water has penetrated into soil, backfill to finish grade.

.2 Form earth watering saucer at the base of each plant with a diameter as large as the excavated area.

.8 For ground covers, backfill soil evenly to finish grade and tamp to eliminate air pockets.

.9 Water plant material thoroughly.

.10 After soil settlement has occurred, fill with soil to finish grade.

.11 After plant installation, remove all labels attached by wire or cord.

3.5 TRUNK PROTECTION

.1 Install trunk protection on deciduous trees as indicated.

.1 Wrap the main stem of each tree having caliper of 50mm or greater.

.2 Apply wrapping in a spiral manner with one-half overlap, each time starting at grade and extending upwards to just above the second branches.

.3 Make sure all wrapping is neat and snug and held in place by suitable cord. All areas of contact with support systems shall be double wrapped.

.1 Install trunk protection before installation of tree supports.

3.6 TREE SUPPORTS

.1 Stake or guy all plants as shown on drawings for individual materials with all supports, guys and fasteners snug and secure

.2 Space stake equally around plant and drive into undisturbed soil beneath roots, 150 mm minimum. Ensure stake is secure, vertical and unsplit.

.3 Ensure stakes are placed on prevailing wind side.

.4 Install guying collars above branch to prevent slipping at approximately 2/3 height for evergreens and 1/2 height for deciduous trees. Collar mounting height not to exceed 2.5 m above grade.

.5 Guying collars to be of sufficient length to encircle tree plus [50] mm space for trunk clearance.

.6 Install flagging tape to guys as indicated.

3.7 PRUNING

.1 After tree supports have been installed, remove broken branches with clean, sharp tools. Do not prune plants except to remove dead or injured branches.

.2 Prune in such a manner as to preserve the natural character of the plants. Do not remove leaders.

3.8 MULCHING

.1 Ensure soil settlement has been corrected prior to mulching.

.2 Spread mulch as indicated.

3.9 MAINTENANCE DURING ESTABLISHMENT PERIOD

.1 Perform following maintenance operations from time of planting to acceptance by Consultant.

.1 Water to maintain soil moisture conditions for optimum establishment, growth and health of plant material without causing erosion.

.1 For evergreen plant material, water thoroughly in late fall prior to freeze-up to saturate soil around root system.

.2 Remove weeds monthly.

.3 Replace or respread damaged, missing or disturbed mulch.

.4 For non-mulched areas, cultivate as required to keep top layer of soil friable.

.5 If required to control insects, fungus and disease, use appropriate control methods in accordance with Municipal regulations. Obtain product approval from Consultant prior to application.

.6 Remove dead or broken branches from plant material.

.7 Keep trunk protection and guy wires in proper repair and adjustment.

.8 Remove and replace dead plants and plants not in healthy and vigorous growing condition. Make replacements in same manner as specified for original plantings.

3.10 MAINTENANCE DURING WARRANTY PERIOD

.1 From time of acceptance by Consultant to end of warranty period, perform following maintenance operations.

.1 Water to maintain soil moisture conditions for optimum growth and health of plant material without causing erosion.

.2 Reform damaged watering saucers.

.3 Remove weeds monthly.

.4 Replace or respread damaged, missing or disturbed mulch.

.5 For non-mulched areas, cultivate monthly to keep top layer of soil friable.

.6 If required to control insects, fungus and disease, use appropriate control methods in accordance with Municipal regulations. Obtain product approval from Consultant prior to application.

.7 Apply fertilizer in early spring as indicated by soil test.

.8 Remove dead, broken or hazardous branches from plant material.

.9 Keep trunk protection and tree supports in proper repair and adjustment.

.10 Remove trunk protection, tree supports and level watering saucers at end of warranty period.

.11 Remove and replace dead plants and plants not in healthy and vigorous growing condition. Make replacements in same manner as specified for original plantings.

.12 Submit monthly written reports to Consultant identifying:

.1 Maintenance work carried out.

.2 Development and condition of plant material.

.3 Preventative or corrective measures required which are outside Contractor's responsibility.

.2 Provide written warranty for 2 years from date of substantial performance. Replace any exterior plants which in the opinion of the Consultant, are not in acceptable condition at the end of the warranty period.

.3 Any damage to plant materials from any source whatsoever shall be reported in writing to the Consultant and Owner.

3.11 CLEANING

.1 Leave Work area clean at end of each day.

.2 Final Cleaning: upon completion remove surplus materials, rubbish, tools and equipment.

3.12 CLOSEOUT ACTIVITIES

.1 Submit maintenance reports for trees, shrubs, and other plantings.

END OF SECTION

Part 1 General

1.1 SUMMARY

.1 The scope of work includes all labor, materials, appliances, tools, equipment, facilities, transportation and services necessary for, and incidental to performing all operations in connection with furnishing, delivery, and installation of landscape edging materials (also known as "edging") complete as shown on the drawings and as specified herein.

.2 The scope of work in this section includes, but is not limited to, the following;

.1 Precast Maintenance Edge

1.2 REFERENCE STANDARDS

.1 ASTM International

.1 ASTM C136-[13] , Standard Test Method for Sieve Analysis of Fine and Coarse Aggregates.

.2 ASTM C140, Standard Test Methods for Sampling and Testing Concrete Masonry Units and Related Units.

.3 ASTM C936, Standard Specification for Solid Concrete Interlocking Paving Units.

.4 ASTM C979/C979M-[10] , Standard Specification for Pigments for Integrally Colored Concrete.

.5 ASTM C1645 Standard Test Method for Freeze-thaw and De-icing Salt Durability of Solid Concrete Interlocking Paving Units

.2 CSA Group

.1 CSA A23.1/A23.2-[09] , Concrete Materials and Methods of Concrete Construction/Test Methods and Standard Practices for Concrete.

.2 CAN/CSA-A179-[04(R2009)] , Mortar and Grout for Unit Masonry.

.3 CSA A231.1/A231.2-[06(R2010)] , Precast Concrete Paving Slabs/Precast Concrete Pavers.

.4 CSA A283-[06(R2011)] , Qualification Code for Concrete Testing Laboratories.

1.3 ACTION AND INFORMATIONAL SUBMITTALS

.1 Submit in accordance with Section 01 33 00 - Submittal Procedures.

.2 Product Data:

.1 Submit manufacturer's instructions, printed product literature and data sheets for precast concrete units and include product characteristics, performance criteria, physical size, finish and limitations.

.3 Samples:

.1 Submit full size samples of each paver type, thickness, colour and finish that indicate the range of colour variation and texture expected upon project completion if requested by consultant for approval.

.2 Accepted samples become the standard of acceptance for the product produced.

.4 Test and Evaluation Reports:

.1 Submit following sampling and testing data:

.1 Sieve analysis for gradation of bedding and joint material.

.2 Precast Unit sampling and testing.

.2 Certificates: submit product certificates signed by manufacturer certifying materials comply with specified performance characteristics and criteria and physical requirements.

1.4 QUALITY ASSURANCE

.1 Qualifications:

.1 Installer: company or person specializing in precast concrete paver installations of similar complexity, size and material with 5 documented years of experience.

1.5 DELIVERY, STORAGE AND HANDLING

.1 Deliver, store and handle materials in accordance with manufacturer's written instructions.

.2 Delivery and Acceptance Requirements: deliver materials to site in original factory packaging, labelled with manufacturer's name and address.

.3 Storage and Handling Requirements:

.1 Store materials off ground in dry location and in accordance with manufacturer's recommendations in clean, dry, well-ventilated area.

.2 Store and protect materials free from mud, dirt, and other foreign materials.

.3 Store and protect precast concrete units from nicks, scratches, and blemishes.

.4 Replace defective or damaged materials with new.

Part 2 Materials

2.1 CONCRETE UNITS

.1 Concrete units to be manufactured by Unilock or approved equivalent.

.1 500mm width: Unilock SiennaStone Coping

.1 Finish: Standard

.2 Color: Natural

.3 Dimensions: 500 mm (20 in) x 1200 mm (47 1/4 in) x 185 mm (7 1/4 in) thick

.2 Pavers shall meet the minimum material and physical properties set forth in ASTM C936.

.1 Average compressive strength 8000psi (55 MPa) with no individual unit under 7,200 psi (50 MPa)

.2 Average absorption of 5% with no greater than 7% when tested according to ASTM C140.

.3 Conforming to ASTM C 1645 when tested for freeze-thaw requirements.

.4 Height tolerances +/- 3.2mm.

.3 Pigment in concrete pavers: to ASTM C979/C979M.

.4 Maximum allowable breakage of product is 5%.

2.2 BASE AGGREGATE

.1 Unit Paving Base Aggregate

.1 Provide Base Aggregate materials conforming to ASTM D 2940 and gradation requirements as presented in Table below:

Table – Base Aggregate Gradation Requirements	
ASTM D 2940	
Sieve Size	**Percent Passing**
2 in (50 mm)	100
1-1/2 in (37.5 mm)	95 to 100
3/4 in (19 mm)	70 to 92
3/8 in (9.5 mm)	50 to 70
No. 4 (4.75 mm)	35 to 55
No. 30 (600 µm)	12 to 25
No. 200 (75 µm)	0 to 8

2.3 CLEANING COMPOUND

.1 Clear, organic solvent, designed and recommended by manufacturer for cleaning concrete units of contamination encountered.

.2 Acid based chemical detergent, designed and recommended by manufacturer for removal of contamination encountered on concrete units.

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 precast concrete unit installation in accordance with manufacturer's written instructions and requirements for installation tolerances and other conditions affecting performance prior to placing concrete units.

.1 Precast Concrete Units on Aggregate Base:

.1 Verify that the Base aggregate materials, thickness, compacted density, surface tolerances and elevations conform to specified requirements.

.2 Inform Consultant of unacceptable conditions immediately upon discovery.

.3 Proceed with installation only after unacceptable conditions have been remedied.

.1 Beginning Paver installation signifies acceptance of base and edge restraint conditions.

3.2 BASE AGGREGATES

.1 Unit Base:

.1 Provide the Base Aggregate material in uniform lifts not exceeding 6 in. (150 mm) over the compacted Subgrade material and compact to at least 98 percent Standard Proctor Density as per ASTM D 698.

.2 Compact the Base Aggregate material with at least two passes in the vibratory mode then at least two in the static mode with a minimum 10 ton vibratory roller until there is no visible movement. Do not crush aggregate with the roller.

.3 Tolerance: Do not exceed the specified surface grade of the compacted Base Aggregate material more than ±3/8 in. (10 mm) over a 10 ft. (3 m) long straightedge laid in any direction.

3.3 INSTALLATION OF CONCRETE UNITS

.1 Replace Concrete Units with chips, cracks, voids, discolorations, and other defects that might be visible in finished work.

.2 Adjust laying pattern at pavement edges such that cutting of edge pavers is minimized. All cut units shall be no smaller than one-third of a whole unit.

.3 Use string lines or chalk lines to hold all pattern lines true.

.4 Set surface elevation of pavers 1/8 in. (3 mm) above adjacent drainage inlets, concrete collars or channels.

.5 Place units hand tight against spacer bars. Adjust horizontal placement of laid units to align straight.

.6 Provide space between paver units of 1/32 in. (1 mm) wide to achieve straight bond lines.

.7 Cut units with motor-driven masonry saw equipment to provide clean, sharp, unchipped edges. Cut units to provide pattern indicated and to fit adjoining work neatly. Use full units without cutting where possible. Hammer cutting is not acceptable.

3.4 FIELD QUALITY CONTROL

.1 Verify final elevations for conformance to the drawings after sweeping the surface clean.

.1 Prevent final Concrete Unit finished grade elevations from deviating more than ±3/8 in. (±10 mm) under a 10 ft (3 m) straightedge or indicated slope, for finished surface of paving.

.2 Paver-to-Paver Lippage:

.1 No greater than 3 mm (1/8 inch) difference in height between adjacent pavers.

3.5 REPAIRING AND CLEANING

.1 Remove and replace units that are loose, chipped, broken, stained, or otherwise damaged or that do not match adjoining units. Provide new units to match adjoining units and install in same manner as original units, with same joint treatment and with no evidence of replacement.

.2 Cleaning: Remove excess dirt, debris, stains, grit, etc. from exposed paver surfaces; wash and scrub clean.

.1 Clean Concrete Pavers in accordance with the manufacturer's written recommendations.

3.6 PROTECTION

.1 Protect completed work from damage due to subsequent construction activity on the site.

END OF SECTION

Part 1 General

1.1 GENERAL REQUIREMENTS

.1 Read and be governed by conditions of the Contract and sections of Division 1.

1.2 SITE CONDITIONS

.1 Underground utility lines or other buried objects not shown on landscape plan are the responsibility of the Contractor and must be established in location and depth before commencing work.

1.3 PROTECTION

.1 Prevent damage to trees, landscaping, natural features, bench marks, surface or underground utility lines, which are to remain. Make good any damage.

Part 2 Products

2.1 MATERIALS

.1 Limestone Boulder Seating:

.1 Material: Wiarton limestone, as supplied by Beaver Valley Stone, T: (416) 222-2424, or approved equal.

.2 Size: 1000(L)x600(W)x600mm ht.

.3 Finish: natural top and bottom, split face exposed sides. Abutting boulders to be sawcut to allow for 10mm maximum gap between boulders. Sharp edges to be ground smooth.

.4 Quantity: in sufficient number to complete layout as shown on plan.

.2 Bedding and backfill material:

.1 Granular ‘A’, conforming to OPSS.

.3 Filter Fabric:

.1 ‘Terrafix 270R’ by Terrafix Geosynthetics Inc. or approved equal, (416) 674-0363.

Part 3 Execution

3.1 EXAMINATION

.1 Examine surfaces and conditions upon which work of this Section depends.

.2 Commencement of work will denote acceptance of surfaces and conditions.

3.2 PREPARATION

.1 Verify dimensions and grades on site and make minor adjustments to suit site conditions and to Landscape Architect's approval. Report any discrepancies to Consultant prior to placing stone.

.2 Remove any unconsolidated soils or deleterious material from bedding area.

.3 Face bedding course as specified to the satisfaction of Consultant prior to placing any stone.

3.3 INSTALLATION

.1 The subgrade shall be graded smooth and compacted to 98% Standard Proctor Maximum Dry Density.

.2 All pieces shall be bedded as shown on the drawings.

.3 All boulders shall tightly abut together, maximum gap between boulders shall be 10mm.

.4 Grind all sharp corners and edges smooth.

3.4 COMPLETION

.1 Upon completion of the work in this section, remove surplus materials, tools, equipment and debris, and leave site in a clean and tidy condition to the complete satisfaction of the Owner.

END OF SECTION

Part 1 General

1.1 RELATED REQUIREMENTS

.1	Section 32 94 55	Soil Cell Filler Soil
.2	Section 32 93 10	Trees, Shrubs and Groundcover Planting

1.2 SUMMARY

.1 Contractors must provide trees with the specified net soil volume within a structured rooting space provided by the soil cell system.

.2 Section Includes:

.1 Furnishing and installing soil cell system, geotextile, geogrids, aeration/irrigation piping, fittings and surface inlets, root management products, underground root ball anchoring systems and inspection portals, sub-base material, backfill, drainage system, mulch, and the installation of soil.

1.3 REFERENCES

.1 Definitions:

.1 Aggregate base course: Aggregate material between the top deck of the soil cell system and the pavement surface above.

.2 Aggregate paver base course: Aggregate material between the aggregate base course and unit surface pavers, designed to act as a setting bed for the pavers.

.3 Aggregate sub-base course: Aggregate material between the bottom of the soil cell system and the compacted subgrade below, designed to distribute loads from the soil cell system to the subgrade.

.4 Aeration / irrigation piping system: A system of small perforated piping that is placed around the tree rootball, and within the structural soil cell system and has inlets at finished grade. This system is used to provide a means of getting air and water into the soil and rootzone, and a means of allowing organic gases, from the decay of organic matter within the soil, to escape

.5 Backfill: Clean, native excavated soil, free from organic matter, frozen materials, stones larger than 3” (75mm) in diameter, debris and other foreign substances.

.6 Compaction: The method of mechanically increasing the density of soil. Soil compaction is measured using the Proctor Test (ASTM D1557-91).

.7 Consultant: The person or entity, (Landscape Architect, Architect, Civil Engineer) employed by the Owner to represent their interest in the review of the Work.

.8 Geogrid: Net-shaped woven polyester fabric with PVC coating, uniaxial or biaxial geogrid, inert to biological degradation, resistant to naturally occurring chemicals, alkalis, and acids; used to provide a stabilizing force within soil structure as the fill interlocks with the grid. Used for reinforcement of granular pavement base.

.9 Geotextile: A geosynthetic fabric, applied to either the soil surface or between materials, providing infiltration, separation or stabilization properties.

.10 Finish Grade: Elevation of the finished pavement or planting surface.

.11 Planting Soil: Soil as defined in Section 32 94 55 Soil Cell Filler Soil, intended to fill the Structural Soil Cell system.

.12 Rootball Anchor System: A below grade system comprised of cables, spearhead or deadman anchors and web strap used for anchoring a rootball into the ground.

.13 Root Barrier: Linear membrane to prevent root penetration into surrounding areas.

.14 Soil Cells: A plastic modular, engineered suspended pavement system designed to be filled with planting soil for tree rooting. It is an engineered, load-bearing system that is designed to be used sub-surface under pedestrian and / or vehicle rated pavement surfaces.

.15 Soil Inspection Port: A plastic pipe extending from the pavement surface down into the top of the soil cell system. This port is used for the sampling and inspection of the soil within the soil cell system and can be used as a means adding nutrients to the soil.

.16 Subgrade: Surface or elevation of subsoil remaining after completing excavation, or top surface of a fill or backfill.

.17 Tree Pit / Tree Well: Excavated space filled with appropriate soil media for tree planting.

.18 Tree Pit Opening: The pavement opening within which a tree is planted.

.19 Subgrade: Surface or elevation of subsoil remaining after completing excavation, or top surface of a fill or backfill.

.20 Subsoil: All soil beneath the topsoil layer of the soil profile, and typified by the lack of organic matter and soil organisms.

.2 Reference Standards:

.1 Ontario Provincial Standard Specifications (OPSS)

.1 OPSS 1010 Material Specification for Aggregates – Base, subbase, Select Subgrade, Backfill

.2 OPSS 1860 Material Specification for Geotextiles

1.4 SUBMITTALS

.1 Action Submittals: Provide submittals in accordance with Section 01 33 00 – Submittal Procedures. Submit these to the Consultant for review and acceptance not less than 7 days prior to start of installation of materials and products specified in this Section.

.1 Product Data: For each type of product, submit manufacturer's product literature with technical data to demonstrate that the product meets these specifications.

.2 Test and Evaluation Reports: For soils and aggregates provide testing agency laboratory analysis.

.1 Compaction Testing Results: Submit results of all compaction testing required by the specifications including the bulk density test of the mock

up and installed soil, and the compaction testing log of penetrometer and moisture meter readings to the Consultant for approval.

.3 Shop Drawings:

.1 Drawings shall show all information needed to fabricate, supply and install soil cell system including aggregate sub-base, horizontal and vertical dimensions and elevations.

.2 Provide shop drawings signed and sealed by a professional engineer licensed to practice in the Province of Ontario.

.4 Qualification Data: Submit proof of qualifications of installer and installer's site supervisor.

.2 Closeout Submittals:

.1 Provide manufacturer's warranty documentation.

1.5 SEQUENCING AND SCHEDULING

.1 General: Prior to the start of Work, prepare a detailed schedule of the work for coordination with other trades.

.2 Schedule all utility installations prior to beginning work in this section.

.3 Where possible, schedule the installation of soil cells after the area is no longer required for use by other trades and work. Protect installed soil cells from damage in the event that work must occur over or adjacent to the completed soil cells.

1.6 QUALITY ASSURANCE

.1 Comply with applicable requirements of the laws, codes, ordinances and regulations of Federal, Provincial and Municipal authorities having jurisdiction. Obtain necessary permits/approvals from these authorities.

.2 Installer Qualifications: Soil cells and related products shall be installed by a qualified installer whose work has resulted in successful installation of Growing Mediums and planter drainage systems, underground piping, chambers and vault structures.

.1 Submit list of completed projects of similar scope and scale to the Consultant, demonstrating capabilities and experience.

.2 The installer and the field supervisor shall have a minimum of ten years successful experience with construction of similar scope in dense urban areas.

.3 Installer's Field Supervision: Installer is required to maintain an experienced fulltime supervisor on Project site when work is in progress. This person shall be identified during the Pre-installation Conference, with appropriate contact information provided, as necessary. The same supervisor shall be utilized throughout the Project, unless a substitution is submitted to and approved in writing by the Consultant.

.3 Materials:

.1 All materials, methods of construction, and workmanship shall conform to applicable requirements of ASTM and Standards, unless otherwise specified.

.2 The quality of material and the finished components shall be subject to inspection by the Consultant. Such inspection may be made on-site upon delivery or at any point thereafter. The components shall be subject to rejection at any time if material fails to meet any of the specification requirements, even though sample components may have been accepted as satisfactory. Components rejected after delivery to the site shall be marked for identification and shall be removed from the site at once.

.4 Inspection:

.1 All components shall be inspected for general appearance, dimensions, soundness, etc.

.2 Upon completion of relevant excavation work, and prior to placement of geotextile and aggregate, the sub-base soil shall be inspected by the Consultant or authorized representative and be signed off on by the Consultant as acceptable and meeting manufacturer's recommendations.

.3 The contractor shall, engage the soil cell manufacturer to provide shop drawings, stamped by a Ontario licensed professional engineer, and to provide periodic construction review by a Ontario licensed professional engineer, in order to ensure that the soil cells are constructed in accordance with the construction documents.

.4 The soil cell Ontario Professional Engineer responsible for the periodic review of the installation.

.5 Product Certificates: For each type of manufactured product, from manufacturer, and complying with the following:

.1 Manufacturer's certified analysis for standard products.

.6 Defects

.1 Products with structural defects shall be immediately removed and replaced with acceptable parts. The Professional Engineer, before final acceptance, shall carefully inspect repairs/replacements.

.7 Layout and Elevation Control

.1 Provide layout and elevation control during installation of soil cells. Utilize grade stakes, benchmarks, surveying equipment and other means and methods to assure that layout and elevations conform to the layout and elevations indicated on the plans.

1.7 DELIVERY, STORAGE & HANDLING

.1 Soil Cells:

.1 Components shall be unloaded, handled and stored in an area protected from traffic and in a manner to prevent damage. Inspect materials to ensure that specified materials have been received.

.2 Store units to avoid damage from other construction activities.

.3 Store soil cell components on pallets, with pallet wrap intact until required for installation.

.2 Protect geogrids and geofabrics from physical damage and from temperatures in excess of 150°F (65°C). Do not expose geogrids and geofabrics to direct sunlight for more than 7 days.

.3 Provide erosion-control measures to prevent erosion or displacement of bulk materials and discharge of soil-bearing water runoff or airborne dust to adjacent properties, water conveyance systems, and walkways. Provide additional sediment control to retain excavated material, backfill, soil amendments and planting mix within the project limits as needed.

1.8 SITE CONDITIONS

.1 Do not proceed with installation when subgrades, soils and planting soils are in a wet, muddy or frozen condition.

.2 Verification of Existing Conditions and Protection of New or Existing Improvements: Before proceeding with work in this section, the Installer shall carefully check and verify all dimensions, quantities, and grade elevations, and inform the Consultant immediately of any discrepancies.

.1 Carefully examine the civil, record, and survey drawings to become familiar with the existing underground conditions before digging. Verify the location of all aboveground and underground utility lines, infrastructure, other improvements, and existing trees, shrubs, and plants to remain including their root system, and take proper precautions as necessary to avoid damage to such improvements and plants.

.2 In the event of conflict between existing and new improvements notify the Consultant in writing and obtain written confirmation of any changes to the work prior to proceeding.

.1 When new or previously existing utility lines are encountered during the course of excavation, notify the Consultant in writing and make recommendations as to remedial action. Proceed with work in that area only upon approval of appropriate remedial action. Coordinate all work with the appropriate utility contractors, utility company or responsible public works agency.

.3 Before proceeding with full scale excavation work, confirm nature of existing soil conditions and in particular the drainage characteristics of existing soil.

.4 Where construction sequencing requires work during cold weather, protect sub grades and bulk materials from freezing using covers or as needed heated tenting. Sub grades that are sufficiently well drained to preclude the buildup of ice may be installed and built upon during freezing weather provided the surface is cleared of snow and any ice bound material.

.5 Protect partially completed soil cell installation against damage from other construction traffic when work is in progress, and following completion with highly visible construction tape, fencing, or other means until construction is complete. Prevent all non-installation related construction traffic over the completed soil cell installation; only allowing loads less than the design loads.

1.9 WARRANTY

.1 Provide manufacturer's standard warranty against defects in materials and workmanship.

.1 Products will be free from defects in components and workmanship for a period of thirty (30) years from date of manufacture.

Part 2 Products

2.1 DESCRIPTION

.1 The soil cell system shall be an engineered suspended pavement system designed specifically for the purpose of providing uncompacted soil for healthy tree growth and under load-bearing pavement surfaces.

.2 The soil cell system shall have the flexibly to be assembled around existing structures, utilities and in tight constraints, specific to the site requirements and achieve the required soil volume. The system shall be easily disassembled and reassembled to allow for utility repair within and below the system.

.3 The soil cell system is a complete system that includes but is not limited to the following integral components supplied by one manufacturer: soil cells, geogrid/geofabric, aeration/irrigation piping, fittings and surface inlets, root management products, underground rootball anchoring system and inspection portals.

2.2 SOIL CELL SYSTEMS

.1 Soil Cell Systems approved for use:

.1 City Green Strata Cell System

.2 Green Blue RootSpace System

.3 GreenBlue StrataCell System

.2 Structural system designed to be filled with Growing Medium for tree rooting and support of vehicle loaded pavements meeting the following requirements:

.1 The structure shall be designed to support loads up to and including AASHTO H20 and Relevant Ontario Building Code standards for sidewalks.

.2 The structures shall be designed to be filled with the growing medium as specified in section 32 94 55 Soil Cell Filler Soil including the type of soil specified; the required limitations of delivery, storage, and handling; the requirement to retain soil peds; and requirements to compact and in-situ test soil compaction to the ranges specified.

.3 The soil cells shall have been specifically designed and tested for the purpose of growing tree roots, and rainwater filtering, detention and retention.

.4 Critical to the soil cell design is that each soil cell or stack of soil cells shall be structurally independent of all adjacent soil cell stacks such that a single stack or group of stacks can be removed after the completion of installation to facilitate future utility installation and repair.

.5 The structural design of each Soil Cell unit shall facilitate the movement of roots and water between each cell and between the edges of the cell system and the

surrounding soils. The design shall facilitate the installation, compaction and in-situ soil compaction testing; installation and maintenance of utilities within and under the soil cells; the movement and expansion of roots; and the lateral capillary movement of water.

.3 Accessories: Shall be supplied as part of the complete soil cell system.

.1 Root Barrier: designed to prevent root penetration for the purpose of protecting building foundations and underground utilities.

.1 The material shall be impermeable and ribbed with a thickness of 1mm to 2mm.

.2 The root barrier shall be the full depth of the soil cells or as shown on approved shop drawings.

.2 Root Collar: designed to redirect tree roots down and away from pavement surfaces at tree pit openings.

.1 The material shall be impermeable and ribbed with a thickness of 1mm to 2mm.

.2 The root collar shall extend to a depth of 300mm minimum, or as required to redirect roots into soil cells.

2.3 GEOGRID

.1 Geogrid shall be high strength, high tenacity, high molecular weight polyester with the following properties: Ultimate Wide Width Tensile Strength 29.2 kN/m Creep Reduced Strength 18.5 kN/m Long Term Design Strength 16.0 kN/m

2.4 GEOTEXTILE

.1 Refer to Class II non-woven geotextile per OPSS 1860.

2.5 AGGREGATE SUB-BASE:

.1 19mm clear crusher run limestone per OPSS 1010.

2.6 BACKFILL MATERIAL (ADJACENT TO SOIL CELLS):

.1 Refer to OPSS 1010. Clean, compactable, coarse grained fill soil meeting the requirements of the Unified Soil Classification system for soil type GW, GP, GC with less than 30% fines, SW, and SC with less than 30% fines. Backfill material shall be free of organic material, trash and other debris, and shall be free of toxic material injurious to plant growth.

2.7 GROWING MEDIUM

.1 Refer to Section 32 94 55 Soil Cell Filler Soil

Part 3 Execution

3.1 GENERAL CONDITIONS

.1 Coordinate the installation with the product manufacturer, to have the manufacturer on-site during product installation.

.2 Review manufacturer's installation procedures and coordinate soil cell system installation with other work affected, such as grading, excavation, utilities, construction access, erosion control, etc.

.3 Cold weather installation or assembly of modules should not be undertaken when temperatures are below 40° F (4.44° C).

.4 Tree Pit Layout: Layout tree pit locations and dimensions using string lines, survey pegs and marking paint. Obtain Consultant's approval of layout before proceeding with excavation.

.5 Tree Pit Depths: Confirm excavation depths with reference to finished pavement elevations. Allow for granular base course layer and, where applicable, drainage layer.

.6 Assembled modules may be walked on, but vehicular traffic is prohibited until properly backfilled and covered per Manufacturer's recommendations. Protect personnel and the installation against damage with highly visible construction tape, fencing, or other means until construction is complete.

3.2 UTILITY COORDINATION

.1 Confirm that the layout of the soil cells is not in conflict with any existing or proposed utility lines or structures. In event that there is a conflict notify the Consultant and take remedial actions to resolve the conflict as instructed by the Consultant. Where needed and approved by the Municipality, utility lines may be installed through the spaces within the soil cell frames.

.1 Secure and brace all utility lines placed within the frames.

.2 Where lines require that the space between cells is larger than 75mm, use the manufacturer's recommended spanning techniques to bridge paving over the gaps between frames.

3.3 EXCAVATION

.1 Excavation required for the installation of all pipes and structures shall be made to the depths and widths indicated on the approved shop drawings. The Contractor shall render the bottom of the excavations firm and dry and in all respects acceptable to the Consultant.

.2 All objectionable material encountered within the limits indicated shall be removed and disposed of by the Contractor.

.3 In excavation faces, all loose or protruding rocks shall be secured or otherwise removed to finished grade. All cut slopes shall be uniformly dressed to the slope, cross-section and alignment shown on the approved shop drawings or as directed by the Consultant or authorized representative.

.4 Furnish, install, monitor and maintain excavation support (e.g., shoring, sheeting, bracing, trench boxes, etc.) as required by Federal, Provincial and Municipal Laws, Ordinances, Regulations and Safety Requirements. Support the sides of excavation, to prevent any movement which could in any way reduce the width of the excavation below that necessary for proper construction and protect adjacent structures from undermining, settlement or other damage.

3.4 SUB-GRADE PREPARATION AND GRADING

.1 Sub-grade shall be unfrozen, level, and free of lumps or debris with no standing water, mud or muck. Do not use frozen materials or materials mixed or coated with ice or frost. A minimum 2,000 pounds per square foot bearing capacity is required.

.2 If Contractor fails to maintain the sub-grade properly, the Contractor shall remove the unsuitable material. If the bottom of any portion of the excavation is removed below the limits shown on the approved shop drawings, it shall be restored to the elevation shown in the Drawings. Compacted native earthen fill is not acceptable.

.3 If in the opinion of the geotechnical engineer, the sub-grade, at or below the normal grade of the excavation as indicated on the approved shop drawings, is unsuitable for construction; it shall be removed to such depth and width as the engineer may direct and be replaced with suitable material as directed.

3.5 INSTALLATION OF SOLID AND PERFORATED DRAIN LINES

.1 Lay out the location of all drain lines. Adjust the alignments to conform to the final locations of sleeves and risers. Do not locate drain lines within 150mm of the edge of any soil cell edge.

3.6 BASE PREPARATION

.1 Install leveling bed, 4” (100 mm) of ¾” (19 mm) angular crushed stone, across the footprint of the structure. Stone shall be rolled, or plate compacted to provide a level surface; free from lumps and debris or any other sharp materials. Base may have up to a 5% slope.

.2 Base shall be compacted to 95% Proctor Density minimum, or as specified by the approved shop drawings.

.3 Dependent on the geotechnical report, the installation may require that a reinforcement geogrid fabric be placed within the base layer. If required, the geogrid fabric shall have placed on top of 2” (50 mm) of aggregate and covered with 2” (50 mm) of aggregate. Overlap geogrid a minimum 12” (300 mm) or as recommended by manufacturer.

3.7 INSTALLATION OF STRUCTURAL SOIL CELL SYSTEM

.1 Installation procedure, as follows, shall be followed by the Contractor. The Contractor shall also reference the Manufacturer’s Installation Guidelines, and where any discrepancy exists the Consultant reserves the right to contact the Manufacturer’s Representative prior to continuation. Installation constitutes acceptance of existing conditions and responsibility for satisfactory performance.

.2 Utilize a soluble paint, chalk or string to outline the footprint of the soil cell system. Prior to the installation of soil cell panels, confirm tree pit dimensions and mark location of trees. Rectify discrepancies and errors. Ensure squareness prior to module placement.

.3 Install soil cell panels in strict accordance with manufacturer's written instructions and installation diagrams. Prior to placement, check each soil cell panel for damage. Reject cracked, chipped and otherwise damaged modules. Ensure that panels in contact with granular base course are firmly seated, with no rocking. Ensure that panels are mechanically interconnected both horizontally and, in multiple layers, vertically.

.4 Upon completion of the soil cell system, wrap the sides of the system with root barrier, or geogrid/fabric to prevent material migration into the structural soil cell system. Take great care to avoid damage to the root or geogrid/fabric barrier during placement. If damage occurs, repair that portion per manufacturer specifications. Do not place geogrid and geotextile curtains between the edge of the Cells and any planting area adjacent to the Cells.

3.8 UTILITIES WITHIN SOIL CELL MATRIX

.1 Utilities within the soil cell units should meet specifications as required by utility company's standards. This may require special treatments, barriers and details to achieve this.

3.9 SOIL FILLING

.1 Obtain Consultant's prior approval to filling the soil cell matrix with filler soil. Install filler soil after soil cell matrix is fully assembled and piping systems and barriers are in place.

.2 Except as shown otherwise on Drawings completely fill all void spaces with filler soil. Place filler soil using an excavator bucket and spread with rakes or shovels

.3 Keep outer trench free of filler soil.

.4 Install no more than two layers of soil cell frames before beginning to install Growing Medium and backfill. Compact the Growing Medium within the soil cells and the backfill material outside the frames in alternating lifts until the desired elevations and density is achieved in both soils.

.5 Install and compact backfill material in the space between the soil cells and the sides of the excavation in lifts that do not exceed 250 mm in depth.

.1 Compact backfill to minimum 95% of maximum dry density using a powered mechanical compactor. Use a pneumatic compacting tool or narrow foot jumping jack compactor for spaces less than 300 mm wide and a 300 mm wide jumping jack compactor or larger equipment in wider spaces.

.2 Maintain the geogrid and geotextile curtain between the soil cells and the backfill material.

.3 Take care to ensure that the compaction process does not allow the machinery to come into contact with the structural soil cell system due to the potential for damage to the root and moisture barrier or geogrid/fabric and structural soil cell system.

.4 Install backfill in alternating lifts with the Growing Medium inside the soil cells.

.6 Growing medium can be compacted in lifts of 8" (200 mm) to 12" (300mm) during placement and compacted by walking over layers or utilizing a hand-held roller designed specifically for this use. Refer to Manufacturer's instructions.

.1 Lightly compact each lift to achieve the following test results. Growing Medium compaction shall be tested at each lift using a cone penetrometer to between 70,000 and 140,000 kg/m2 (100 and 200 psi) when the soil is between 12% and 20% moisture.

.2 If the Growing Medium becomes overly compacted, remove the soil and reinstall. Use hand tools or other equipment that does not damage the soil cells.

.3 Eliminate air pockets and voids. Fill each frame such that there is a minimum of 200 mm of soil over the top of the soil cells before beginning compaction

3.10 ROOT BARRIERS AND ROOT AND MOISTURE BARRIERS

.1 Install root barriers and root collars as shown on Drawings. Overlap barrier joints 8" (200mm) and tape both sides of joint. Top edge of barriers shall be level with adjacent construction. Ensure that earth surfaces in contact with barriers are flat and free of sharp debris and stones to avoid puncturing barriers. Install ribbed root barriers with ribs facing inward.

3.11 INSTALLATION OF GEOCOMPOSITE

.1 Install the geogrid with integrated non-woven geotextile on top of the structural soil cell system allowing it to extend 12" (300 mm) vertical down the sides of the structural soil cell system, and 12" (300 mm) horizontal away from the structural soil cell system. Overlap geogrid with integrated non-woven geotextile a minimum 8" (200 mm).

3.12 GRANULAR BASE COURSE FOR PAVEMENT

.1 Continue backfilling the perimeter and top of the structural soil cell system in 6" (150 mm) lifts, until specified depth is reached. Each lift shall be compacted at the specified moisture content to a minimum of 95% of the Standard Proctor Density.

.2 Only low-pressure tire or track vehicles shall be operated over the structural soil cell system during construction. No machinery should drive on top of the structural soil cell system until a minimum backfill and compaction is achieved. Dump trucks and heavy equipment shall not be operated within the structural soil cell system footprint at any time. Where necessary the heavy equipment should unload in an area adjacent to the structural soil cell system and the material should be moved over the system with low-pressure tire or track equipment.

.3 Ensure that all unrelated construction traffic is kept away from the limits of excavation until the project is complete and final surface materials are in place. No non-installation related loading should be allowed over the structural soil cell system until the final design section has been constructed (including pavement).

.4 Place surfacing or paving materials over the structural soil cell system with care to avoid displacement of cover fill and damage to surrounding areas.

3.13 SITE QUALITY CONTROL

.1 Compaction Tests: Testing agency shall perform compaction testing on sub-grade and on each layer of fill to determine compliance with specified compaction. Determine method and frequency of testing in consultation with Consultant.

3.14 TREE PIT OPENINGS

.1 Confirm exact location of tree pit openings. Cut geo-composite layer and fold back to expose opening. Position perimeter formwork.

.2 Line opening with root collar with ribs facing inward. Extend root collar down to top of soil cell matrix and up to level of finished pavement. Lap root collar joints 8” (200mm) and tape both sides of joint.

3.15 CLEANING & PROTECTION

.1 Perform cleaning during the installation of work and upon completion of the work.

.2 Remove from site all excess materials, debris, and equipment. Repair any damage to adjacent materials and surfaces resulting from installation of this work.

3.16 CLOSEOUT ACTIVITIES

.1 Provide manufacturer’s warranty.

END OF SECTION

Part 1 General

1.1 RELATED REQUIREMENTS

.1 Section 32 94 50 Structural Soil Cells

1.2 SUMMARY

.1 Section Includes:

.1 Labor, materials, tools, supplies, equipment, facilities, transportation and services necessary for, and incidental to performing all operations in connection with furnishing, and delivery of a non-proprietary planting soil for use in the soil cell system, including related materials and activities.

1.3 REFERENCES

.1 Definitions:

.1 SOIL CELL SYSTEM: A specifically engineered suspended pavement system designed specifically for the purpose of providing uncompacted soil for healthy tree growth and/or stormwater management (bioretention) under load-bearing pavement surfaces. It is a complete system that includes but is not limited to the following integral components: soil cells, geogrid/geofabric, aeration/irrigation piping, fittings and surface inlets, root management products, underground rootball anchoring system and inspection portals.

.2 BACKFILL: Clean, native excavated soil, free from organic matter, frozen materials, stones larger than 3” (75mm) in diameter, debris and other foreign substances.

.3 COMPACTION: The method of mechanically increasing the density of soil. Soil compaction is measured using the Proctor Test (ASTM D1557-91).

.4 CONSULTANT: The person or entity, (Landscape Architect, Architect, Civil Engineer) employed by the Owner to represent their interest in the review of the Work.

.5 EXISTING SOIL: Native soil existing at the locations of proposed planting of area designated for the installation of the soil cell system after the majority of the construction within and around the site is completed and just prior to the start of Work to excavate the soil.

.6 GROWING MEDIUM: Filler or planting soil is synonymous with growing medium. An amended existing topsoil that contains organic matter, is capable of sustaining vigorous plant growth, contains a typical clay content of <18% by mass and is free from unwanted matter such as:

.1 Stones, rock and pebbles in accordance with the specifications listed,

.2 Hard clods or objects in accordance with the specifications listed,

.3 Roots in accordance with the specifications listed,

.4 Sticks and rubbish,

.5 Material toxic to plants,

.6 Materials that may pose a danger to human health, e.g. glass, hard plastic.

.7 SOIL CELL: A plastic modular, engineered suspended pavement system comprising of interlocking vertical uprights, infill panels and a top deck that allows for air movement above the soil profile. This system is designed to be filled with planting soil for tree rooting; bioretention soil for tree rooting and stormwater attenuation and pollutant removal; or left empty and used for stormwater infiltration, detention or retention. It is an engineered, load-bearing system that is designed to be used sub-surface under pedestrian and/or vehicle rated pavement surfaces.

.2 Reference Standards:

.1 Agriculture and Agri-Food Canada

.1 The Canadian System of Soil Classification, Third Edition, 1998

.2 Canadian Council of Ministers of the Environment

.1 PN1340-2005, Guidelines for Compost Quality.

.3

1.4 ADMINISTRATIVE REQUIREMENTS

.1 Contractor

.1 The Contractor shall be responsible for coordinating work under this section with other trades and disciplines impacting this work.

.2 Testing Agency Services

.1 Provide and pay for the services of an independent testing agency to perform the testing activities specified in this section. Testing agency shall be acceptable to Consultant.

.2 Test work in accordance with specified standards. In the absence of a specified standard, comply with the relevant ASTM standard.

.3 Test Reports: Testing agency shall prepare test reports for all tests performed. Submit copies of test reports to Consultant immediately upon their becoming available.

1.5 SUBMITTALS

.1 Action Submittals: Provide submittals in accordance with Section 01 33 00 – Submittal Procedures. Submit these to the Consultant for review and acceptance not less than 7 days prior to start of installation of products specified in this Section.

.1 Product Data:

.1 For each type of product, submit manufacturer's product literature with specifications sufficient to demonstrate that the product meets these specifications.

.2 Test and Evaluation Reports:

.1 Submit required soil test analysis report for each sample of imported topsoil, existing site soil, and planting soil mixes from an approved soil-testing laboratory as follows:

.1 If tests fail to meet the Specifications, obtain other sources of material or amend, retest and resubmit until accepted by the Consultant.

.2 Soil testing by a recognized testing facility for pH, P and K, soil texture (% sand / % silt / % clay) and organic matter.

.1 Testing of topsoil will be carried out by SCS Agrifood Laboratories (T:519-837-1242).

.3 Soil sampling, testing and analysis to be in accordance with Provincial standards.

.2 Soil-testing laboratory shall provide tests and prepare test reports for all tests performed. Submit copies of test reports to Consultant immediately upon their becoming available.

.3 All soil testing will be at the expense of the contractor.

1.6 QUALITY ASSURANCE

.1 Supplier Qualifications:

.1 Soil Supplier: Planting soil mixes shall be supplied by a firm that specializes in the production of mixes of planting soils and have at least 5 years' experience in providing planting soil mixes soils to projects of similar size and scope to this Work.

.2 Submit documentation of the qualifications of the planting soil supplier and their field supervisor, sufficient to demonstrate that both meet the requirements of this specification.

.3 Submit list of completed projects of similar scope and scale demonstrating capabilities and experience.

.2 Testing Agency

.1 Testing agency shall have an established track record in testing the type of soil required by this specification and shall have soils testing facilities and personnel capable of performing the physical and chemical testing required by this specification. Testing agency personnel shall be experienced in soil mix design and in making soil recommendations.

.2 Test materials in accordance with specified standard listed below. In the absence of a specified standard, comply with the relevant ASTM standard.

.3 Test Reports: Testing agency shall prepare test reports for all tests performed. Submit copies of test reports to Consultant immediately upon their becoming available.

.3 Workmanship:

.1 Materials supplied from operations that have a third party endorsed quality assurance program may be accepted subject to the timely submission to Consultant of the relevant documentation.

1.7 DELIVERY, STORAGE & HANDLING

.1 Bulk Materials:

.1 When filler soil is being loaded, ensure that loading equipment does not pick up underlying material and that tires and tracks do not till other material into the mix.

.2 Provide erosion-control measures to prevent erosion or displacement of bulk materials, discharge of soil-bearing water runoff, and airborne dust reaching adjacent properties, water conveyance systems, or walkways.

.3 Protect stockpiled material from rain, wind erosion and other detrimental weather effects.

.4 Do not move or handle materials when they are wet or frozen.

Part 2 Products

2.1 SOIL CELL PLANTING SOIL

.1 To ensure effective infilling of the cells, the planting soils need to be friable and non-plastic during placement and installation. To help maintain a free-flowing soil, soil texture and moisture content are critical soil properties.

.2 Planting Soil shall meet the following requirements,

.1 Purity: Free of pests, disease, and fungus.

.2 Foreign matter: On visual inspection, free from non-soil material, brick and other building materials and wastes, sharps, hydrocarbons, plant matter, weed roots, stolon’s, rhizomes, and any other foreign matter or material or substance that would render the soil or soil ameliorant unsuitable for horticultural use.

.3 Contamination: Do not use soils contaminated with rubbish or other materials that are:

.1 Corrosive, explosive or flammable.

.2 Hazardous to human or animal life.

.3 Detrimental to healthy plant growth.

.3 Planting Soil shall meet the following performance requirements,

Parameter	Unit	Lower Limit	Upper Limit
pH Value *(Optimal pH is highly dependent on the tree species to be planted and should be tested and adjusted based on species prior to planting.)*	Unit	6.5	7.5
Organic Material	% / weight	8.0	12.0
Total combined silt and clay	% / weight	18.0	35.0
Medium to Course sand	% / weight	45.0	
CEC	MEQ/100g	>25	
Phosphorus	ppm	10	60
Potassium	ppm	80	250
Calcium	ppm		<5000
Magnesium	ppm	100	300
Total Salts			<1.5

Part 3 Execution

3.1 GENERAL

.1 Verify that planting soil meets specifications.

.2 Verify that the soil cell system installation has been completed and approved by the Consultant.

.3 Verify that no foreign or deleterious material or liquid such as paint, paint washout, concrete slurry, asphalt/concrete layers or chunks, cement, plaster, oils, gasoline, diesel fuel, paint thinner, turpentine, tar, roofing compound, solid waste, or acid has been deposited in planting soil or soil cell system.

.4 Proceed with placement of planting soil only after unsatisfactory conditions have been corrected.

3.2 INSTALLATION

.1 Place planting soil in the soil cell system in ≤12” (300 mm) lifts or layers, in accordance with structural soil cell system manufacturer’s specifications.

.2 Compaction: Compact each lift of soil media to ~70 percent of maximum Standard Proctor density according to ASTM D 698

.3 Finish Grading: Grade soil media so that it is flush with the top of the Soil cell system. Rake to remove ridges, and fill depressions to meet finish grades.

.4 Install geocomposite on top of the soil cell system allowing it to extend 12” (300 mm) vertical down the sides of the structural soil cell system, and 12” (300 mm) horizontal away from the structural soil cell system. Overlap geocomposite a minimum 8” (200 mm).

3.3 CLEANING & PROTECTION

.1 Perform cleaning during the installation of work and upon completion of the work.

.2 Remove from site all excess materials, debris, and equipment. Repair any damage to adjacent materials and surfaces resulting from installation of this work.

END OF SECTION

1. GENERAL

1.1. General Requirements

1. Conform to the requirements stated in the General Conditions, Supplementary General Conditions of this Specification and all addenda for all work, including work outside the property line including work within Regional and Municipal right of way unless otherwise noted.

1.2. Related Work

1.	Site Grading	Section 31 23 13
2.	Excavating, Trenching and Backfilling	Section 31 23 10
3.	Storm Sewers	Section 33 44 00
4.	Aggregates: General	Section 31 05 17

1.3. References

1. ASTM A48/A48M-03 (2016), Specification for Gray Iron Castings.
2. ASTM C139-18 (1989), Specification for Concrete Masonry Units for Construction of Catch Basins and Manholes.
3. ASTM C478M-90, Specification for Precast Reinforced Concrete Manhole Sections
4. CSA A3000, Portland Cement.
5. CSA A3000, Masonry Cement.
6. CAN/CSA-A23.1-M90, Concrete Materials and Methods for Concrete Construction.
7. CSA A82.56-M1976, Aggregate for Masonry Mortar.
8. CAN3-A165 Series-M85, CSA Standards on Concrete Masonry Units.
9. CAN/CSA-G30.18-M92, Billet Steel Bars for Concrete Reinforcement.
10. CAN/CSA-G164-M92, Hot Dip Galvanizing of Irregularly Shaped Articles.
11. Ontario Provincial Standard Specification 407.

2. PRODUCTS

2.1. Materials

1. Precast manhole units: to ASTM C478M, circular or oval. Top sections eccentric cone or flat slab top type with opening offset for vertical ladder installation. Monolithic bases to be approved by Consultant and set on concrete slabs cast in place.
    1. 1200 mm diameter manhole as per OPSD 701.010.
2. Precast catch basins: to ASTM C478M.
    1. Catch basins as per OPSD 705.010
3. Joints: to be made watertight using rubber rings or cement mortar.
4. Mortar:
    1. Aggregate: to CSA A82.56.
    2. Cement: to CAN/CSA-A8.
5. Ladder rungs: to CAN/CSA-G30.18, No. 25M billet steel deformed bars, hot dipped

galvanized to CAN/CSA G164 Rungs to be safety pattern (drop step type).

6. Adjusting rings: to ASTM C478M.
7. Concrete Brick: to CAN3-A165 Series.
8. Frames, gratings, covers to dimensions as indicated and following requirements:
    1. Metal gratings and covers to bear evenly on frames. A frame with grating or cover to constitute one unit. Assemble and mark unit components before shipment.
    2. Gray iron castings: to ASTM A48, strength class 30B.
    3. Castings: coated with two applications of asphalt varnish.
    4. Storm manhole frames and covers: heavy duty municipal type for road service. Cover cast without perforations and complete with two 25 mm square lifting holes, as per OPSD 400.010, unless otherwise specified.
    5. Catchbasin frame and cover: as per OPSD 400.010.
    6. Manhole frame and cover as per OPSD 401.010 Type A.
9. Granular bedding and backfill: Granular B Type I: to OPSD 1010 and Section 02701 – Aggregates: General and to Section 02315 – Excavating, Trenching and Backfilling.
10. Unshrinkable fill: to Section 02315 – Excavating, Trenching and Backfilling.

3. EXECUTION

3.1. Excavation and Backfill

1. Excavate and backfill in accordance with Section 31 23 10 – Excavating, Trenching and Backfilling.
2. Obtain approval of Consultant before installing manholes or catch basins.

3.2. Installation

1. Construct units in accordance with details indicated, plumb and true to alignment and grade.
2. Complete units as pipe laying progresses. Maximum of three units behind point of pipe laying will be allowed.
3. Dewater excavation free of standing water or as directed by Consultant and remove soft and foreign material before placing concrete base.
4. Set precast concrete base on 150 mm minimum of granular bedding compacted to 100% Corrected Maximum Dry Density.
5. Precast units.
    1. Set bottom section of precast unit in bed of cement mortar and bond to concrete slab or base. Make each successive joint watertight with rubber ring gaskets, cement mortar, or combination thereof.
    2. Clean surplus mortar and joint compounds from interior surface of unit as work progresses.
    3. Plug lifting holes with precast concrete plugs set in cement mortar or mastic compound.
6. For sewers:

1. Place stub outlets and bulkheads at elevations and in positions indicated.
2. Bench to provide a smooth U-shaped channel in manholes.

7. Compact granular backfill to 98% Corrected Maximum Dry Density.
8. Place frame and cover on top section to elevation as indicated. If adjustment required use concrete ring.
9. Clean units of debris and foreign materials. Remove fins and sharp projections. Prevent debris from entering system.

3.3. **Leakage Test**

1. Visual inspection of leakage will be carried out. If any leakage is observed, correct leakage as directed by Consultant at no additional cost.

END OF SECTION

1. GENERAL

1.1. General Requirements

1. Conform to the requirements stated in the General Conditions, Supplementary General Conditions of this Specification and all addenda for all work, including work outside the property line including work within Regional and Municipal right of way unless otherwise noted.

1.2. Description

1. The work included in this Section includes for all labour, equipment and materials required for the watermain construction within the site, and watermain construction within the municipal right of way connecting to existing municipal servicing.
2. Included in the work is coordination and cooperation with Municipal forces as required to complete the work including providing temporary blow offs, isolation valves, pressure testing and chlorination as required by Municipal forces.

1.3. Related Work

1. Excavating, Trenching and Backfilling — Section 31 23 10

1.4. References

1. The Municipality Standards and Specifications for watermain construction.

1.5. Scheduling Of Work

1. Schedule work to minimize interruptions to existing services.

2. PRODUCTS

1. All products utilized within the water system to comply with the Municipality Standards and Specifications.

3. EXECUTION

3.1. Preparation

1. Clean pipes, fittings, and appurtenances of accumulated debris and water before installation. Carefully inspect materials for defects to approval of Consultant. Remove defective materials from site as directed by Consultant.

3.2. Trenching

1. Do trenching work in accordance with Section 31 23 10 – Excavating, Trenching and Backfilling.
2. Trench depth to provide cover over pipe of not less than 1.75 metres from finished grade or as indicated.
3. Trench alignment and depth require Consultants' approval prior to placing bedding material and pipe.

3.3. **Granular Bedding**

1. Place granular bedding material in uniform layers not exceeding 150 mm compacted thickness to depth of 300 mm below bottom of pipe or to depth as indicated.
2. Do not place material in frozen condition.
3. Shape bed true to grade to provide continuous uniform bearing surface for pipe.
4. Shape transverse depressions in bedding as required to suit joints.
5. Compact each layer full width of bed to at least 95% of corrected maximum dry density.
6. Fill authorized or unauthorized excavation below design elevation of bottom of specified bedding in accordance with Section 31 23 10 – Excavating, Trenching and Backfilling with compacted bedding material.

3.4. **Pipe Installation**

1. Lay pipes to ANSI/AWWA C600 Manual of Practice and manufacturer's standard instructions and specifications. Do not use blocks except as permitted in 3.3.2.
2. Join pipes in accordance with ANSI/AWWA C600, ANSI/AWWA C206, AWWA Manual of Practice and manufacturer's recommendations.
3. Bevel or taper ends of PVC pipe to match fittings.
4. Handle pipe by methods approved by Engineer recommended by pipe manufacturer. Do not use chains or cables passed through pipe bore so that weight of pipe bears on pipe ends.
5. Lay pipes on prepared bed, true to line and grade. Ensure barrel of each pipe is in contact with shaped bed throughout its full length. Take up and replace defective pipe. Correct pipe which is not in true alignment or grade or pipe which shows differential settlement after installation greater than 10 mm in 3 m.
6. Face socket ends of pipe in direction of laying. For mains on a grade of 2% or greater, face socket ends upgrade.
7. Do not exceed permissible deflection at joints as recommended by pipe manufacturer.
8. Keep jointing materials and installed pipe free of dirt and water and other foreign materials. Whenever work is stopped, install a removable watertight bulkhead at open end of last pipe laid to prevent entry of foreign materials.
9. Position and join pipes with equipment and methods approved by Consultant.
10. Cut pipes in an approved manner as recommended by pipe manufacturer, without damaging pipe or its coating and to leave smooth end at right angles to axis of pipe.
11. Align pipes carefully before jointing.
12. Install gaskets to manufacturer's recommendations. Support pipes with hand slings or crane as required to minimize lateral pressure on gasket and maintain concentricity until gasket is properly positioned.
13. Avoid displacing gasket or contaminating with dirt or other foreign material. Gaskets so disturbed or contaminated shall be removed, cleaned, lubricated and replaced before jointing is attempted again.
14. Complete each joint before laying next length of pipe.
15. Minimize deflection after joint has been made.
16. Apply sufficient pressure in making joints to ensure that joint is completed to manufacturer's recommendations.

17. Ensure completed joints are restrained by compacting bedding material alongside and over installed pipes or as otherwise approved by the Consultant.

18. Provide necessary fittings and adaptors as required between existing watermain pipe materials and proposed watermain pipe materials.

19. When stoppage of work occurs, block pipes in an approved manner to prevent creep during down time.

20. Recheck plastic pipe joints assembled above ground after placing in trench to ensure that no movement of joint has taken place.

21. Do not lay pipe on frozen bedding.

22. Contractor responsible for satisfactory completion of hydrostatic and leakage testing to Consultant's approval. Contractor also responsible for degree of backfilling complete prior to hydrostatic and leakage testing as well as isolation and correction of any leaks resulting in failed tests.

23. Backfill remainder of trench.

3.5. Cathodic Protection And Tracer Wire

1. Install as per Municipal Standards,

3.6. Hydrostatic And Leakage

1. Provide labour, equipment and materials required to perform hydrostatic and leakage tests hereinafter described as required by the Municipality standards.

2. Notify Consultant at least 24 h in advance of all proposed tests. Perform tests in presence of Consultant.

3. Where any section of system is provided with concrete thrust blocks, conduct tests at least 5 days after placing concrete or 2 days if high early strength concrete is used.

4. Test pipeline in sections not exceeding 365 m in length, unless otherwise authorized by Consultant.

5. Upon completion of pipe laying and after Consultant has inspected work in place, surround and cover pipes between joints with approved granular material placed to dimensions indicated or directed by Consultant.

6. Leave hydrants, valves, backflow preventer, water meter, joints and fittings exposed.

7. When testing is done during freezing weather, protect hydrants, valves, backflow preventer, water meter, joints and fittings from freezing.

8. Strut and brace caps, bends, tees, and valves, to prevent movement when test pressure is applied.

9. Open valves.

10. Expel air from main by slowly filling main with potable water. Install corporation stops at high points in main where no air-vacuum release valves are installed. Remove stops after satisfactory completion of test and seal holes with plugs.

11. Thoroughly examine exposed parts and correct for leakage as necessary.

12. Examine exposed pipe, joints, fittings and appurtenances while system is under pressure.

13. Remove joints, fittings and appurtenances found defective and replace with new sound material and make watertight.

14. Repeat hydrostatic test until all defects have been corrected.

15. Apply a leakage test pressure of equal to design pressure after complete backfilling of

trench, based on elevation of lowest point in main and corrected to elevation of gauge, for period of 2 h.

16. Define leakage as amount of water supplied from water meter in order to maintain test pressure for 2 h.

17. Do not exceed allowable leakage of 0.03 L/mm diameter per 300 m of pipe, including lateral connections, per hour.

18. Locate and repair defects if leakage is greater than amount specified.

19. Repeat test until leakage is within specified allowance for full length of water main.

Pipe Surround

20. Upon completion of pipe laying and after Consultant has inspected work in place, surround and cover pipes as indicated.

21. Hand place surround material in uniform layers not exceeding 150 mm compacted thickness as indicated. Do not dump material within 5 m of pipe.

22. Place layers uniformly and simultaneously on each side of pipe.

23. Do not place material in frozen condition.

24. Compact each layer from pipe invert to mid height of pipe to at least 95% of SPMDD to ASTM D698.

25. Compact each layer from (mid height) of pipe to underside of backfill to at least 95% of SPMDD and in accordance with Geotechnical Report for site.

3.7. **Backfill**

1. Place backfill material above pipe surround in uniform layers not exceeding 150 mm compacted thickness up to grades as indicated.

2. Do not place backfill in frozen condition.

3. Compact native backfill to at least 95% of SPMDD.

3.8. **Flushing And Disinfecting**

1. The Municipality shall perform all chlorination works.

2. Flush water mains through available outlets with a sufficient flow of potable water to produce a velocity of 1.5 m/s, within pipe for 10 min., or until foreign materials have been removed and flushed water is clear.

3. Flushing flows shall be as follows:

Pipe Size NPS	Flow (L/s) Minimum
6 and below	38
8	75

4. Provide connections and pumps for flushing as required.

5. Open and close valves, hydrants and service connections to ensure thorough flushing.

6. Complete flushing to satisfaction of Consultant and The Municipal forces.

END OF SECTION

1. GENERAL

1.1. General Requirements

1. Conform to the requirements stated in the General Conditions, Supplementary General Conditions of this Specification and all addenda for all work, including work outside the property line including work within Regional and Municipal right of way unless otherwise noted.

1.2. Related Work

1.	Site Grading	Section 31 23 13
2.	Excavating, Trenching and Backfilling	Section 31 23 10
3.	Manholes and Catchbasins	Section 33 05 14
4.	Aggregates: General	Section 31 05 17

1.3. References

1. ASTM D3034, Specification for Type PSM Poly Vinyl Chloride (PVC) Sewer Pipe and fittings.
2. CAN/CSA-B182.2, PVC Sewer Pipe and Fittings (PSM Type),
3. CAN/CSA-B182.11, Recommended Practice for the Installation of Plastic Crain and Sewer Pipe and Pipe Fittings.
4. Ontario Provincial Standard Specification 410.

1.4. Material Certification

1. Submit manufacturer's test data and certification at least 2 weeks prior to commencing work.
2. Certification to be marked on pipe.

1.5. Scheduling of Work

1. Schedule work to minimize interruptions to existing services and to maintain existing flow during construction.

2. PRODUCTS

2.1. PVC Pipe

Poly Vinyl Chloride pipe as specified in the Contract Drawings shall be in accordance with OPSS 410, Pipe Sewer Installation in Open Cut.

2.2. Pipe Bedding, Surround and Cover Materials

1. Granular embedment materials to Section 31 05 17 – Aggregates.

2.3. Backfill Material

1. Backfill to Section 31 23 10 – Excavation, Trenching and Backfilling
2. Backfill within the public right of way to be un-shrinkable fill.

2.4. Joint Mortar

1. Portland cement: to CAN/CSA-A5, normal type 10.
2. Mortar: one part Portland cement to two parts clean sharp sand mixed with minimum amount of water to obtain optimum consistency for use intended. Do not use additive..

3. EXECUTION

3.1. Preparation

1. Clean pipes and fittings of debris and water before installation, and remove defective materials from site.

3.2. Trenching

1. Do trenching work in accordance with Section 31 23 10 – Excavating, Trenching and Backfilling.
2. Do not allow contents of any sewer or sewer connection to flow into trench.
3. Trench alignment and depth to approval of Consultant prior to placing bedding material and pipe.

3.3. Granular Bedding

1. Place granular bedding material to details indicated in bedding detail OPSD 802.010 to OPSD 802.054, depending on type of soil and pipe. Use Class B bedding and place bedding in unfrozen condition. Type of soil to be defined in the field as Type 1, 2, 3, or 4 as per Health and Safety Act and Regulations for Construction Projects.
2. Place granular bedding material in uniform layers not exceeding 150 mm compacted thickness.
3. Compact each layer full width of bed to at least 95% corrected maximum dry density.
4. Shape bed true to grade and to provide continuous, uniform bearing surface for pipe. Do not use blocks when bedding pipes.
5. Shape transverse depressions as required to suit joints.
6. Fill excavation below bottom of specified bedding adjacent to manholes or catch basins with compacted common backfill.

3.4. Installation of Sanitary Sewer Pipes

1. Lay and join pipe in accordance with manufacturer’s recommendations and to approval of Consultant.
2. Handle pipe using methods approved by Consultant. Do not use chains or cables passed through rigid pipe bore so that weight of pipe bears upon pipe ends.
3. Commence laying at outlet and proceed in upstream direction with socket ends of pipe facing upgrade.
4. Do not exceed maximum joint deflection recommended by pipe manufacturer.
5. Do not allow water to flow through pipes during construction except as may be permitted by Consultant.
6. Whenever work is suspended, install removable watertight bulkhead at open end of last pipe laid to prevent entry of foreign materials.
7. PVC Pipe as specified in the Contract Drawings shall be installed in accordance with OPSS 410, Pipe Sewer Installation in Open Cut.
8. When any stoppage of work occurs, restrain pipes as directed by Consultant, to prevent “creep” during down time.
9. Cut pipes as required for special inserts, fittings or closure pieces, as recommended by pipe manufacturer, without damaging pipe or its coating and to leave smooth end at right

angles to axis of pipe.

10. Make watertight connections to manholes and catch basins. Use shrinkage compensating grout when suitable gaskets are not available. Support connections as per OPSD 708.020.

11. Use prefabricated saddles or approved field connections for connecting pipes to existing sewer pipes. Joint to be structurally sound and watertight.

12. Temporarily plug open upstream ends of pipes with removable watertight concrete, steel or plastic bulkheads.

3.5. **Pipe Surround**

1. Place surround material in unfrozen condition.

2. Upon completion of pipe laying, and after Consultant has inspected pipe joints, surround and cover pipes as indicated.

3. Hand place surround material in uniform layers not exceeding 150 mm compacted thickness as indicated. Pipe surround material to extend 300 mm above crown of pipe.

4. Place layers uniformly and simultaneously on each side of pipe.

5. Compact each layer from pipe invert to mid height of pipe to at least 95% corrected maximum dry density.

3.6. **Backfill**

1. Place backfill material in unfrozen condition.

2. Place backfill material above pipe surround in uniform layers not exceeding 150 mm compacted thickness up to grades as indicated.

3.7. **Field Testing**

1. Repair or replace pipe, pipe joint or bedding found defective.

2. When directed by Consultant, draw tapered wooden plug with diameter of 50 mm less than nominal pipe diameter through sewer to ensure that pipe is free of obstruction.

3. Remove foreign material from sewers and related appurtenances by flushing with water.

END OF SECTION

1. GENERAL

1.1. General Requirements

1. Conform to the requirements stated in the General Conditions, Supplementary General Conditions of this Specification and all addenda.

1.2. Related Work

1.	Excavating, Trenching and Backfilling	Section 31 23 10
2.	Manholes and Catchbasins	Section 33 05 14
3.	Aggregates: General	Section 31 05 17

1.3. References

1. ASTM C14, Specification for Concrete Sewer, Storm Drain and Culvert Pipe.
2. ASTM C76, Specification for Reinforced Concrete Culvert, Storm Drain and Sewer Pipe
3. ASTM C443M-85a (1990), Specification for Joints for Circular Concrete Sewer and Culvert Pipe, using Rubber Gaskets.
4. CSA A3000, Portland Cement.
5. CAN/CSA-A257, Series M92, Standards for Concrete Pipe.
6. CAN3-G401-M81, Corrugated Steel Pipe products.
7. Ontario Provincial Standard Specification 410.

1.4. Material Certification

1. Certification to be marked on pipe.

1.5. Scheduling of Work

1. Schedule work to minimize interruptions to existing services and to maintain existing flow during construction.

2. PRODUCTS

2.1. Concrete Pipe

1. Non-reinforced circular concrete pipe and fittings: to CAN/CSA-A-257-2, ASTM C14M, Class 3 designed for flexible rubber gasket joints to ASTM C443 M and CAN/CSA A257.
2. Reinforced circular concrete pipe and fittings: to CAN/CSA-A257, ASTM C76M, strength classification as indicated in the Contract Drawings, designed for flexible rubber gasket joints to ASTM C443M and CAN/CSA A257.
3. Manufactured tees for pipe to pipe connections.
4. Lifting holes:
    1. Pipe 900 mm and less diameter: no lift holes.
    2. Pipe greater than 900 mm diameter: lift holes not to exceed two in piece of pipe.

3. Provide pre-fabricated plugs to effectively seal lift holes after installation of pipe.

2.2. PVC Pipe

Poly Vinyl Chloride pipe as specified in the Contract Drawings shall be in accordance with OPSS 410, Pipe Sewer Installation in Open Cut.

2.3. Pipe Embedment, Surround and Cover Materials

1. Granular material to Section 31 05 17 – Aggregates.
2. Granular A to Section 31 23 13 – Site Grading
3. Pipe embedment shall be in accordance with OPSD 802.010

2.4. Backfill Material

1. Backfill shall be granular material as specified in Section 31 23 10 – Excavation, Trenching and Backfilling.

2.5. Joint Mortar

1. Portland cement: to CAN/CSA-A5, normal type 10.
2. Mortar: one part Portland cement to two parts clean sharp sand mixed with minimum amount of water to obtain optimum consistency for use intended. Do not use additives.

3. EXECUTION

3.1. Preparation

1. Clean pipes and fittings of debris and water before installation, and remove defective materials from site.

3.2. Trenching

1. Do trenching work in accordance with Section 31 23 10 – Excavating, Trenching and Backfilling.
2. Do not allow contents of any sewer or sewer connection to flow into trench.
3. Trench alignment and depth to approval of Consultant prior to placing bedding material and pipe.

3.3. Granular Bedding

1. Place granular bedding material to details indicated in bedding detail OPSD 802.010 to OPSD 802.054, depending on type of soil and pipe. Use Class B bedding and place bedding in unfrozen condition.

Type of soil to be defined in the field as Type 1, 2, 3, or 4 as per Health and Safety Act and Regulations for Construction Projects.

2. Place granular bedding material in uniform layers not exceeding 150 mm compacted thickness.
3. Compact each layer full width of bed to at least 95% corrected maximum dry density.

4. Shape bed true to grade and to provide continuous, uniform bearing surface for pipe. Do not use blocks when bedding pipes.
5. Shape transverse depressions as required to suit joints.
6. Fill excavation below bottom of specified bedding adjacent to manholes or catch basins with compacted granular backfill.

3.4. Installation of Storm Drainage Pipes

1. Lay and join pipe in accordance with manufacturer's recommendations and to approval of Consultant.
2. Handle pipe using methods approved by Consultant. Do not use chains or cables passed through rigid pipe bore so that weight of pipe bears upon pipe ends.
3. Commence laying at outlet and proceed in upstream direction with socket ends of pipe facing upgrade.
4. Do not exceed maximum joint deflection recommended by pipe manufacturer.
5. Do not allow water to flow through pipes during construction except as may be permitted by Consultant.
6. Whenever work is suspended, install removable watertight bulkhead at open end of last pipe laid to prevent entry of foreign materials.
7. Joints

1. Poly Vinyl Chloride Pipe

PVC Pipe as specified in the Contract Drawings shall be installed in accordance with OPSS 410, Pipe Sewer Installation in Open Cut.

8. When any stoppage of work occurs, restrain pipes as directed by Consultant, to prevent "creep" during down time.
9. Cut pipes as required for special inserts, fittings or closure pieces, as recommended by pipe manufacturer, without damaging pipe or its coating and to leave smooth end at right angles to axis of pipe.
10. Make watertight connections to manholes and catch basins. Use shrinkage compensating grout when suitable gaskets are not available. Support connections as per OPSD 708.020.
11. Use prefabricated saddles or approved field connections for connecting pipes to existing sewer pipes. Joint to be structurally sound and watertight.
12. Temporarily plug open upstream ends of pipes with removable watertight concrete, steel or plastic bulkheads.

3.5. Pipe Surround

1. Place surround material in unfrozen condition.
2. Upon completion of pipe laying, and after Consultant has inspected pipe joints, surround and cover pipes as indicated.
3. Hand place surround material in uniform layers not exceeding 150 mm compacted thickness as indicated. Pipe surround material to extend 300 mm above crown of pipe.
4. Place layers uniformly and simultaneously on each side of pipe.
5. Compact each layer from pipe invert to mid height of pipe to at least 95% corrected maximum dry density.

3.6. Backfill

1. Place backfill material in unfrozen condition.
2. Place backfill material above pipe surround in uniform layers not exceeding 150 mm compacted thickness up to grades as indicated.
3. Trench backfill shall be imported granular material consisting of Granular B Type I, or reclaimed granulars free of organics.
4. Trench backfill within the public right of way is to be un-shrinkable fill.

3.7. Field Testing

1. Repair or replace pipe, pipe joint or bedding found defective.
2. When directed by Consultant, draw tapered wooden plug with diameter of 50 mm less than nominal pipe diameter through sewer to ensure that pipe is free of obstruction.
3. Remove foreign material from sewers and related appurtenances by flushing with water.

END OF SECTION

1. GENERAL

1.1. General Requirements

1. Conform to the requirements stated in the General Conditions, Supplementary General Conditions of this Specification and all addenda.

1.2. Related Work

1. Excavating, Trenching and Backfilling — Section 31 23 10
2. Aggregates: General — Section 31 05 17

1.3. References

1. OPSS 1801 – Corrugated Steel Pipe Products
2. OPSS 1840 – Polyethylene Pipe Products
3. OPSS 1860 – Geotextiles
4. CSA G164-M1981 – Hot Dip Galvanizing of Irregularly Shaped Articles.
5. CGSB 41-GP-29Ma-1983 - Tubing, Plastic, Corrugated, Drainage

1.4. Material Certification

1. Certification to be marked on pipe.

1.5. Scheduling of Work

1. Schedule work to minimize interruptions to existing services and to maintain existing flow during construction.

2. PRODUCTS.

2.1. PVC Pipe

Poly Vinyl Chloride pipe as specified in the Contract Drawings shall be in accordance with OPSS 410, Pipe Sewer Installation in Open Cut.

2.2. Pipe Embedment, Surround and Cover Materials

1. Granular material to Section 31 05 17 – Aggregates.
2. Pipe embedment shall be in accordance with OPSD 802.010

2.3. Backfill Material

1. Backfill shall be granular material as specified in Section 31 23 10 – Excavation, Trenching and Backfilling.

3. EXECUTION

3.1. Preparation

1. Clean pipes and fittings of debris and water before installation, and remove defective materials from site.

3.2. Trenching

1. Do trenching work in accordance with Section 31 23 10 –

Excavating, Trenching and Backfilling.

2. Do not allow contents of any sewer or sewer connection to flow into trench.

3. Trench alignment and depth to approval of Consultant prior to placing bedding material and pipe.

3.3. Granular Pipe Surround

1. Granular materials surrounding the pipe shall be in accordance with OPSS 1010.

3.4. Installation of Subdrains

1. Installation of subdrains is to be in accordance with OPSS 405.

3.5. Pipe Surround

1. Place surround material in unfrozen condition.

2. Pipe surround material shall be HL-8 Coarse Bedding Stone

3.6. Backfill

1. Place backfill material in unfrozen condition.

2. Place backfill material above pipe surround in uniform layers not exceeding 150 mm compacted thickness up to grades as indicated.

3. Trench backfill shall be imported granular material consisting of Granular B Type I, or reclaimed granulars free of organics.

4. Trench backfill within the public right of way is to be un-shrinkable fill.

END OF SECTION

PART 1 GENERAL

1.1 SUMMARY

.1 This Section includes sub drainage systems for planting areas, play areas, permeable pavements, landscape walls and edges.

1.2 REFERENCES

.1 ASTM International, latest edition:

.1 D2321: Standard Practice for Underground Installation of Thermoplastic Pipe for Sewers and other Gravity-Flow Applications

.2 D3034, Standard Specification for Polyvinyl Chloride (PVC) Plastic Pipe

.3 D4491/D4491M Standard Test Methods for Water Permeability of Geotextiles by Permittivity

.4 F405 Standard Specification for Corrugated Polyethylene (PE) Pipe and Fittings.

.5 F667, Standard Specification for Large Diameter Corrugated Polyethylene (PE) Pipe and Fittings

.2 American Association of State Highway and Transportation Officials (AASHTO)

.1 M 252 - Standard Specification for Corrugated Polyethylene Drainage Pipe 3”-10” (75mm to 250mm)

.3 Ontario Provincial Standard Specification

.1 OPSS.PROV 1010 Material Specification for Aggregates – Base, Subbase, Select Grade and Backfill Material

PART 2 PRODUCTS

2.1 PIPES AND FITTINGS

.1 Perforated / Non-Perforated PE Pipe and Fittings: ASTM F 405 or AASHTO M 252, Type CP; corrugated, for coupled joints.

.1 Couplings: Manufacturer's standard, band type.

2.2 CLEANOUTS

.1 PVC Cleanouts: ASTM D 3034, PVC cleanout threaded plug and threaded pipe hub.

.2 Pipe Plug for Softscape: PVC

.3 Pipe Plug for Hardscape:

.1 Cast Iron plug and housings, flush with surrounding surfaces and suitable for heavy duty exterior applications.

2.3 SOIL MATERIALS

.1 Backfill, drainage course, impervious fill, and satisfactory soil materials are specified in Division 31 Section "Excavation and Fill."

2.4 GEOTEXTILE FILTER FABRICS

.1 Description: Fabric of PP or polyester fibers or combination of both, with flow rate range from to 330 gpm/sq. ft. when tested according to ASTM D 4491.

.1 Structure Type: Nonwoven, needle-punched continuous filament.

.2 Style(s): Flat and sock.

2.5 GRANULAR

.1 Perforated Drainage Pipes: 19mm Clear Stone, 50mm min. pipe surround and minimum 300mm depth to bottom of pipe, to OPSS 1004.

.2 Non-Perforated Drainage Pipes: Granular 'A' to OPSS 1010.

PART 3 EXECUTION

3.1 EARTHWORK

.1 Excavating, trenching, and backfilling are specified in Division 31.

3.2 PIPING APPLICATIONS

.1 Underground Subdrainage Piping:

.1 Perforated PE pipe and fittings, couplings, and coupled joints.

3.3 PIPING INSTALLATION

.1 Install piping beginning at low points of system, true to grades and alignment indicated, with unbroken continuity of invert. Bed piping with full bearing in filtering material. Install gaskets, seals, sleeves, and couplings according to manufacturer's written instructions and other requirements indicated.

.2 Use increasers, reducers, and couplings made for different sizes or materials of pipes and fittings being connected. Reduction of pipe size in direction of flow is prohibited.

.3 Install PE piping according to ASTM D 2321.

3.4 CLEANOUT INSTALLATION

.1 Cleanouts for Subdrainage:

.1 Install cleanouts and riser extensions from piping to top of slab or grade. Locate cleanouts at beginning of piping run in soft landscape and at changes in direction. Install fittings so cleanouts open in direction of flow in piping.

3.5 CONNECTIONS

.1 Connect low elevations of subdrainage system to storm drainage system.

3.6 FIELD QUALITY CONTROL

.1 Testing: After installing drainage course to top of piping, test drain piping with water to ensure free flow before backfilling. Remove obstructions, replace damaged components, and repeat test until results are satisfactory.

3.7 CLEANING

.1 Clear interior of installed piping and structures of dirt and other superfluous material as work progresses. Maintain swab or drag in piping and pull past each joint as it is completed. Place plugs in ends of uncompleted pipe at end of each day or when work stops.

END OF SECTION

Part 1 General

1.1 SECTION INCLUDES

.1 Materials and installation for foundation and underslab drainage.

1.2 RELATED SECTIONS

.1 Section 31 23 10 - Excavating, Trenching and Backfilling.

.2 Section 03 30 00 – Cast-in-Place Concrete.

1.3 REFERENCES

.1 American Society for Testing and Materials International, (ASTM)

.1 ASTM D698-[00a], Standard Test Method for Laboratory Compaction Characteristics of Soil Using Standard Effort (12,400 ft-lbf/ft^3 (600 kN-m/m^3)).

.2 Canadian General Standards Board (CGSB)

.1 CAN/CGSB-34.22-[94], Asbestos-Cement Drain Pipe.

.3 Canadian Standards Association (CSA International)

.1 CSA-A23.1/A23.2-[00(June 2001)], Concrete Materials and Methods of Concrete Construction/Methods of Test for Concrete.

.2 CSA B1800-[02], Plastic Non-pressure Pipe Compendium - B1800 Series (Consists of B181.1, B181.2, B181.3, B181.5, B182.1, B182.2, B182.4, B182.6, B182.7, B182.8 and B182.11).

.1 CSA B182.2-[02], PVC Sewer Pipe and Fittings (PSM Type).

.3 CSA-G401-[01], Corrugated Steel Pipe Products.

.4 Department of Justice Canada (Jus)

.1 Canadian Environmental Protection Act, 1999 (CEPA)

.5 Transport Canada (TC)

.1 Transportation of Dangerous Goods Act, 1992 (TDGA)

1.4 WASTE MANAGEMENT AND DISPOSAL

.1 Remove from site and dispose of packaging materials at appropriate recycling facilities.

.2 Collect and separate for disposal packaging material for recycling.

.3 Divert unused concrete materials from landfill to local facility.

.4 Divert unused aggregate materials from landfill to facility for reuse.

.5 Divert unused metal materials from landfill to metal recycling facility for disposal approved by Consultant.

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.6 Divert unused geotextiles from landfill to plastic recycling facility for disposal approved by Consultant.

.7 Place materials defined as hazardous or toxic in designated containers.

.8 Handle and dispose of hazardous materials in accordance with the CEPA, TDGA, Regional and Municipal regulations.

.9 Dispose of unused asbestos cement pipe in accordance with regulations governing the disposal of hazardous materials.

1.5 SITE CONDITIONS

.1 Examine sub-surface investigation report which is bound into specifications.

.2 Known underground utility lines and buried objects are as indicated on plans.

Part 2 Products

2.1 BEDDING AND SURROUND MATERIALS

.1 Coarse filter aggregate: to CSA-A23.1/A23.2, Group 1, 15 mm.

.2 Fine filter aggregate: to CSA-A23.1/A23.2.

.3 Flexible plastic tubing and fittings. Corrugated, Non-perforated, nominal inside diameter 100 and 150 mm. Type 1 for discharge lines, Type 2 perforated and wrapped with filter fabric for collector lines.

.4 Geodrains: “Terradrain” 600 by Terrafix or approved equal.

.5 Filter Fabric: “Terrafix” 270R or Mirafi 140.

2.2 BACKFILL MATERIAL

.1 In accordance with Section 31 23 10 - Excavating, Trenching and Backfilling and as indicated on drawings.

.2 Excavated or graded material existing on site may be suitable to use if approved by Engineer.

Part 3 Execution

3.1 EXAMINATION

.1 Ensure graded subgrade conforms with required drainage pattern before placing bedding material.

.2 Ensure improper slopes, unstable areas, areas requiring additional compaction or other unsatisfactory conditions are corrected to approval of Consultant.

.3 Ensure foundation wall have been installed and approved by Consultant before placing bedding material.

3.2 BEDDING PREPARATION

.1 Cut trenches in subgrade and place bedding material in uniform layers not exceeding 150 mm compacted thickness to depth as indicated.

.2 Shape bed true to grade and to provide continuous, uniform bearing surface for tubing.

.3 Shape transverse depressions, as required, to suit joints.

.4 Compact each layer full width of bed to at least 95% of corrected maximum dry density.

.5 Fill excavation below design elevation of bottom of specified bedding with compacted bedding material.

3.3 INSTALLATION AT PERIMETER OF BUILDING AND AREAS WITHIN FOUNDATION PERIMETER

.1 If drain is not on footing, place a min. 100 mm of coarse filter material.

.2 At planter locations, install geodrain against wall from finish grade to weeping tile invert elevation – temporary hold it in place until backfilled.

.3 Lay wrapped perforated pipe directly on coarse filter material. Invert of pipe to be minimum of 250 mm below underside of floor slab. Provide pipes sloping to drains as shown on drawings. Minimum slope 1%.

.4 Install minimum 150 mm of coarse filter material to sides and top of perforated pipe for perimeter drainage.

.5 Install minimum 300 mm Granular "B" all around coarse filter material (sides and top).

.6 Install minimum 150 mm coarse filter material cover on all sides of non-perforated pipe.

.7 Ensure pipe interior and coupling surfaces are clean before laying.

.8 Do not use concrete, masonry, stones, wood or any type of shim to establish pipe slope.

.9 Connect pipes using manufacturer's recommended fittings and seal joints with sewer compound.

.10 Protect pipe ends from damage and ingress of foreign material at each end of each day's work or work stoppage.

.11 Place filter material after pipe installation has been inspected.

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.12 Place filter material by hand in 150 mm lifts. Consolidate by tamping lightly. Prevent displacement of pipe.

.13 Backfill trench (1 m wide minimum) with Granular "B" lightly compacted to 95% standard density (except under paved and slab on grade areas: 98%) up to 700 mm below finished grade.

.14 In landscaped areas place 600 mm of impermeable backfill seal compacted clay prior to the placing of top soil.

3.4 INSTALLATION UNDER PAVED AREAS

.1 Install weeping tile around parking perimeter at concrete curbs and at drains were indicated.

.2 Trench for weeping tile will be 300 mm wide and extend to a depth of 350 mm minimum in the subgrade below granular base.

.3 Line trench with filter cloth. Filter cloth shall be wide enough to overlap 150 mm minimum after backfilling.

.4 Place 40 mm of clear crushed aggregate and compact to 98% standard proctor maximum dry density.

.5 Lay 150 mm diameter perforated pipe directly on compacted granular material. Minimum slope 0.5%.

.6 Where weeping tile pipe joins into other piping or material at storm drains or catch basins and at all direction changes, use specifically designed fittings and seal joints with sewer compound in accordance with manufacturer's instructions.

.7 Fold filter cloth over compacted granular. Overlap 150 mm minimum.

.8 Backfill trench up to subgrade elevation with clear crushed aggregate compacted to 98% standard proctor maximum dry density.

3.5 BACKFILL MATERIAL

.1 Place backfill material above tubing surround in uniform layers not exceeding 150 mm compacted thickness up to grades as indicated.

.2 Under paving and walks, compact backfill to at least 95% corrected maximum dry density. In other areas, compact to at least 90% corrected maximum dry density.

END OF SECTION

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