T E N D E R
Tender # 2020-085103T –
Building Renovations – Fire Station No. 1

Emailed tenders addressed Chris Roberts, CPPB, SCMP, Supervisor, Supply Chain Management, with the title:

"Tender # 2020-085103T –
Building Renovations – Fire Station No. 1"

will be received until 2:30 pm, Tuesday, November 24, 2020 for the renovations of the former Fire Prevention Offices in Fire Station No. 1 in accordance with the enclosed specifications, drawings, terms and conditions.

In light of the current Covid-19 pandemic, there will be no public opening. Tender results will be posted to the City's website following the opening.

The lowest or any tender not necessarily accepted.

Chris Roberts, CPPB, SCMP
Supervisor

Issued for Tender: Friday, November 6, 2020

City of Saint John

Contract Specifications

CONTRACT NO.

2020-085103T

City of Saint John

CONTRACT SPECIFICATIONS

FOR

CONTRACT NO.

2020-085103T

City of Saint John

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DIVISION 1 – PROJECT DESCRIPTION

PROJECT DESCRIPTION

1.1 GENERAL DESCRIPTION

The work consists generally of the renovations of the former fire prevention offices located at Fire Station No. 1, 45 Leinster Street, Saint John, NB.

1.2 CONTRACT DOCUMENTS

a) General Specifications, City of Saint John, New Brunswick, with all applicable Divisions as listed in the Table of Contents of the Contract Specifications.

b) Contract Specifications,
Contract No.: 2020-05103T
Contract: Building Renovations – Fire Station No. 1
City of Saint John, New Brunswick

c) List of Drawings

A1	Key Plan, Second Floor Plan – Existing and New Conditions
A2	Reflected Ceiling Plan – Existing and New Conditions & Details
A3	Interior Elevations & Details
A4	Flooring Layout & Wall Panel Details
E1	Lighting Layout
E2	Power Layout
E3	Electric Heating Layout
E4	Communications Layout
M1	Existing and New Plumbing Plans
M2	Existing and New HVAC Plans

1.3 AUTHORIZED ENQUIRIES CONTACT

During the procurement phase for this project, all enquiries pertaining to the work specified in this Contract shall be referred to:

Chris Roberts, SCMP, CPPB
Supervisor,
City of Saint John
175 Rothesay Avenue,
Saint John, NB
supplychainmanagement@saintjohn.ca (Email)

City of Saint John

CONTRACT SPECIFICATIONS

DIVISION 2

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City of Saint John

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DIVISION 2 – INSTRUCTIONS TO TENDERERS AND TENDERING PROCEDURES

INSTRUCTIONS TO TENDERERS AND TENDERING PROCEDURES

2.1 TRADE TREATIES AND TENDERING POLICY

2.1.01 Internal Trade Agreements and Provincial Procurement Act

Tenderers should note that the within procurement is subject to the Province of New Brunswick Procurement Act and Regulation 2014-93 as well as internal trade agreements including the Atlantic Procurement Agreement and the Agreement on opening public procurement for Quebec and NB.

2.1.02 Procurement Policy

Tenderers should note that the within Procurement shall conform to The City of Saint John's Policy for the Procurement of Goods, Services and Construction.

2.2 MATERIAL DISCLOSURES

2.2.01 General

The City makes the following material disclosures with respect to this Request for Tender. While the City has used considerable efforts to ensure the accurate representation of all information in this Request for Tender, including these material disclosures, such information is supplied solely as a guideline for Tenderers. The City does not warrant or guarantee the accuracy of such information, nor is such information necessarily comprehensive or exhaustive. Nothing in this Request for Tender is intended to relieve Tenderers of the obligation to form their own opinions and reach their own conclusions with respect to the matters addressed in this Request for Tender.

2.2.02 Permits Required for Project

Except as stated otherwise in the Tender Document, any and all permits and approvals required by the Authorities having jurisdiction, and arrangements for all inspections of the Work by these Authorities shall be obtained and paid for by the Contractor. The cost of such approvals, permits and inspection shall be included in the Tender Price.

2.2.03 Deemed Examination and Acceptance

Tenderers should note that by submission of a Tender they will be deemed to have examined and accepted the Specifications and Drawings, visited the site, and informed themselves as to existing conditions and limitations.

2.2.04 Availability of Services

The Tenderer shall ascertain from the relevant Authorities the availability of services, including, but not limited to, electricity, sewer, water, telephone, natural gas and transportation to the project and shall ascertain what prior notice each Authority will require for the installation of the service to the project.

2.2.05 Tax

a) Tenderers are advised to make special note of all applicable tax procedures.

b) The City is required to pay the Harmonized Sales Tax (HST).

c) Tenderers shall submit their Tenders on the basis that the total amount of the Tender shall **exclude all taxes** for which the City is liable.

2.2.06 Performance Guarantees Required Prior to Contract Execution

Within five (5) Working Days following the City's notice of selection, the selected Tenderer shall provide the City with the required Performance Guarantees, in the form of either:

a) A Performance Bond and a Labour and Material Payment Bond, each at fifty percent (50%) of the Tender Price covering the faithful performance of the full Contract. The bonds shall be in favour of *The City of Saint John* and show *The City of Saint John* as obligee; or

b) A certified cheque in the amount of twenty percent (20%) of the Tender Price covering the faithful performance of the full contract.

2.2.07 Insurance

The Contractor shall supply and keep in force for the full term of this Contract, a Wrap up Liability policy against liability for bodily and property damage that may arise with respect to the Work being performed under the Contract. This policy shall include the following:

a) Coverage shall be on an occurrence basis with inclusive limits of at least five million dollars ($5,000,000);

b) The City of Saint John, the Sub-Contractors, the Engineer and the Architect, shall be named as Additional Insured with respect to the operations of the Contractor;

c) Contractual Liability with respect to this Contract;

2.2.07 Insurance (Cont'd)

d) Coverage for bodily injury and property with the amount set forth;

e) A Cross Liability Clause;

a) Contingent Employers Liability coverage;

b) Non-Owned Automobile or licensed vehicle Liability coverage;

c) Completed Operations coverage, with respect to this Contract, that shall remain in force for the duration of the guarantee period (maintenance period) which is a period of twelve (12) months from the date of issuance of the Certificate of Final Completion;

d) Thirty (30) days' written notice shall be given to the City of Saint John in the event of the cancellation, substantial amendment, or lapse, of this policy.

e) Coverage for Broad Form property damage; and

A separate policy endorsement shall be provided if any blasting is to be carried out under the Contract.

Automobile Insurance

The Contractor shall insure and maintain insurance against liability for bodily injury and property damage caused by motor vehicles owned by the Contractor and used with respect to the Work. Such insurance shall have an inclusive limit of at least five million dollars ($5,000,000). For the purposes of this Contract, the definition of a "motor vehicle" shall be the same as the definition of a "motor vehicle" in the *Motor Vehicle Act,* R.S.N.B., c. M-17, and amendments thereto.

2.2.08 WorkSafeNB Certificate / Business Corporations Act Certificate

a) New Brunswick Tenderers shall provide to the City a WorkSafeNB certificate which confirms proper registration and good standing with WorkSafeNB and a *Business Corporations Act* Certificate which confirms proper registration with the Province of New Brunswick - Corporate Affairs (of which the Contractor must be in good standing) within five (5) Working Days following the City's notice of selection.

b) Out-of-province Tenderers shall provide to the City a WorkSafeNB certificate which confirms proper registration and good standing with WorkSafeNB or a letter or certificate issued under the equivalent applicable legislation in the province of origin of the Tenderer confirming extension of coverage from said legislation to the Province of New Brunswick for the term of the Contract. Subject to paragraph c), out-of-province Tenderers shall also provide a *Business Corporations Act*

2.2.08 WorkSafeNB Certificate /Business Corporations Act Certificate (Cont'd)

Certificate which confirms proper registration with the Province of New Brunswick - Corporate Affairs (of which the Contractor must be in good standing) within five (5) Working Days following the City's notice of selection.

c) Tenderers from Nova Scotia may submit the appropriate *Business Corporations Act* Certificate from the Province of Nova Scotia.

2.2.09 New Brunswick Construction Safety Association

If the total Tender Price for the work, inclusive of HST, is two hundred and fifty thousand dollars ($250,000.00) or more, Tenderers shall supply a Letter of Good Standing under the Certificate of Recognition Program from the New Brunswick Construction Safety Association. Out-of-Province Tenderers shall supply an equivalent from the Tenderer's Province of origin acceptable to the Engineer.

2.2.10 Timetable for Completion of the Work

The Substantial Completion of the Work is TBD.

2.3 SCHEDULE FOR THE TENDER PROCESS

Issue Date of Request for Tender	Friday, November 5, 2020
Deadline for Enquiries	Monday, November 16, 2020, 4:00 pm, AST
Deadline for Issuing Addenda	Tuesday, November 17, 2020, 4:00 pm, AST
Tender Closing	Tuesday, November 24, 2020, 2:30 pm, AST

The Schedule for the Tender Process is tentative only and may be changed by the City in its sole discretion at any time prior to Tender Closing.

2.4 TENDER DOCUMENTS

2.4.01 Tender Documents to be Obtained in Prescribed Manner

Tender details and addenda may be obtained from the City of Saint John's website at: www.saintjohn.ca, City Services and News, under the menu option "Tenders and Proposals**".**

2.4.01 Tender Documents to be Obtained in Prescribed Manner (Cont'd)

All Tenderers must register on the City's official list of bidders for this project by sending an email to mat-man@saintjohn.ca and providing the following:

(i) registration of the full legal name, contact person, telephone number, email address and fax number of the Tenderer who has obtained the Tender Documents

The names of the Tenderers having complied with the above criteria will be consolidated onto the City's official bidders list. Only Tenderers listed on the City's official bidders list shall be entitled to submit a Tender. Any Tender received from a Tenderer who is not registered on the City's official list of bidders for this project in the manner set out above will not be evaluated.

The City will post the official list of bidders for all projects, updated on Tuesdays and Thursdays during the tendering period on the City of Saint John website www.saintjohn.ca under the Tenders & Proposals link.

2.5 COMMUNICATIONS AFTER ISSUANCE OF TENDER

2.5.01 Tenderers to Review Tender Documents

Tenderers shall promptly examine all Tender Documents and:

a) shall report any errors, omissions or ambiguities; and

b) may direct enquiries or seek additional information

in writing by email before the Deadline for Enquiries to the Authorized Enquiries Contact as set out below. No such communications are to be directed to anyone other than the Authorized Enquiries Contact.

Authorized Enquiries Contact

Chris Roberts, SCMP, CPPB
Supervisor,
City of Saint John
175 Rothesay Avenue,
Saint John, NB
supplychainmanagement@saintjohn.ca (Email)

It is the Tenderer's responsibility to seek clarification from the City on any matter it considers unclear. The City shall not be responsible for any misunderstanding on the part of the Tenderer concerning this Tender or its process.

The City intends to confirm receipt of a Tenderer's communication by way of an email or facsimile in reply. If a Tenderer has not received a reply, the Tenderer may wish to resend its communication as the lack of reply may have resulted from a technical problem. The City is under no obligation to respond to enquiries or provide additional information but may do so at its sole discretion.

2.5.02 Fax and Email Communication

The following provisions shall apply to any communications with the Authorized Enquiry Contact by email where such email communication or delivery is permitted by the terms of this Tender:

a) The City does not assume any risk or responsibility or liability whatsoever to any Tenderer:

(i) for ensuring that any email system being operated for the City is in good working order, able to receive transmissions, or is not engaged in receiving other transmissions such that a Tenderer's transmission cannot be received;

(ii) if a permitted email communication or delivery is not received by the City, or is received in less than its entirety, within any time limit specified by this Tender; and

2.5.02 Fax and Email Communication (Cont'd)

(iii) for any error that may occur in the submission of communications or enquiries.

b) All permitted communications submitted by a Tenderer by email to the Authorized Enquiries Contact shall be deemed to have been received on the dates and times indicated on the Authorized Enquiry Contact's email system

2.5.03 Addenda: Responses to Enquiries and Amendments or Clarifications to Tender Documents

The City may, in its sole and absolute discretion, through the Authorized Enquiry Contact, respond to enquiries and/or amend the Tender Documents before Tender Closing.

Written Addenda are the only means of responding to enquiries or amending the Tender Documents. Only the Authorized Enquiry Contact, and no other employee or agent of the City, is authorized to respond to enquiries and amend the Tender Documents by issuing an Addendum.

Responses to enquiries, changes, clarifications or corrections prepared and circulated by the City form part of the Tender Documents and will be issued as Addenda. Responses will be made in writing and distributed by fax and/or email to all Tenderers who are registered as receiving the tender documents, as of the date the response is prepared by the City. Interested tenderers not registered as receiving the tender documents must download all addenda from the City's website at www.saintjohn.ca under the "Tenders and Proposals" option.

Each Addendum will contain a signature page(s) which each Tenderer is required to sign and include with its Tender submission. While the City will make reasonable efforts to deliver each Addendum to all Tenderers, it makes no guarantee of timely delivery of any Addendum to any Tenderer.

The City will not identify the source of the question in the response. If a Tenderer requests that an enquiry be treated as confidential, the City, in its sole discretion, will either treat the enquiry or any reply as confidential or inform the Tenderer that it will not respond to the enquiry unless the Tenderer withdraws in writing its request that the enquiry be treated as confidential.

Orally communicated information shall not be binding upon the City. Information offered from sources other than the Authorized Enquiry Contact with regard to the content, intent or interpretation of this Tender is not official, may be inaccurate and should not be relied on in any way, by any Tenderer, for any purpose.

2.6 SUBMISSION OF TENDER

2.6.01 Location of Tender Box for the Submission of Tender

Due to the Covid-19 Situation, all bid submissions will be received electronically before the submission deadline by emailing a signed electronic document in PDF format, complete with all mandatory forms to supplychainmanagement@saintjohn.ca . The email subject must include the Tender No. and Title of Work.

2.6.02 Tenders Must be Submitted Only in the Prescribed Manner

a) Tenders must be submitted in the prescribed *Form of Tender.* The *Form of Tender* shall be filled out in ink or typewritten and bear the signature in longhand.

b) Repealed.

c) Repealed.

d) Repealed.

e) All Tenders shall include a surety consent letter or agreement to bond as per the requirements in the Form of Tender.

2.6.03 Contingency Allowance

Not applicable.

2.6.04 Tenders Must be Emailed Before Tender Closing

It is the responsibility of each Tenderer to ensure that its Tender is emailed before the submission date. Tenders submitted after Tender Closing will be deemed late and Disqualified.

The City is not responsible for any Tender that has not been received before the submission deadline. The City assumes no responsibility for improperly addressed Tenders.

2.6.05 Amending or Withdrawing Tender Prior to Tender Closing

At any time prior to Tender Closing, a Tenderer may amend or withdraw a submitted Tender by emailing an amending letter signed by the person who signed the Tender to mat-man@saintjohb.ca before the Tender Closing.

The amending letter should clearly specify that the Tenderer intends to withdraw its Tender or, in the case of an amendment, clearly indicate the part of the Tender that the amending letter is intending to replace. In the case of a unit price contract, the amending letter shall show the revision to the Tender Price. In the case of a lump sum contract, the amending letter shall state the amount to be added or subtracted from the Tender Price.

The email should clearly state the full legal name of the Tenderer, as well as the Tender No., Title of Work, and Tender Closing date and time as stated in section 2.6.02 b).

2.6.06 Tenderers Shall Bear the Costs of Preparing and Submitting a Tender

Under no circumstances will the City be responsible for a Tenderer's costs of preparing or submitting a Tender.

2.6.07 Tenders in English

All Tenders are to be in English only. Any Tenders that are not entirely in the English language may be disqualified.

2.6.08 Tender Acceptance Period

Tenders submitted before Tender Closing shall remain open to acceptance in the form submitted by the Tenderer for a period of ninety (90) calendar days after Tender Closing. Failure of the Tenderer to keep the Tender open for ninely (90) calendar days will result in the enforcement of the Tender (Bid) Bond or the cashing of the certified cheque submitted in lieu of the Tender (Bid) Bond pursuant to section 2.6.02 c).

2.6.09 Tender Documents Incorporated into Tender

By submission of a Tender, a Tenderer is deemed to have accepted and incorporated all the instructions and terms and conditions contained in the Tender Documents into its Tender. Submission of a Tender shall also confirm that the Tenderer is satisfied as to the correctness and sufficiency of the Tender, the Tender Price and the prices entered in the *Schedule of Quantities and Unit Prices*.

2.7 AMENDMENT OR WITHDRAWAL OF TENDER POST TENDER CLOSING

2.7.01 No Amendment Post Tender Closing

No Tenderer is permitted to amend or withdraw its Tender after Tender Closing. A Tenderer who discovers an error in his Tender after Tender Closing may leave the Tender as is or request permission from Common Council to withdraw its Tender. A request to withdraw a Tender after Tender Closing must be delivered, along with the reasons for the request, to the Common Clerk for consideration by Common Council within twenty-four (24) hours of Tender Closing.

2.7.02 Withdrawal Requests

Common Council, in its sole discretion, will decide whether or not to grant the withdrawal request based on the information supplied by the Tenderer and a recommendation from City staff. Where Common Council, in its sole discretion, decides to not allow the withdrawal, Common Council may require the Tenderer to perform the Contract or forfeit the Tender (Bid) Bond or the certified cheque submitted in lieu thereof pursuant to section 2.6.02 c).

2.8 TENDER EVALUATION PROCESS

2.8.01 Delivery of Tender Box to Tender Opening Room

Immediately following Tender Closing, the Purchasing Agent shall deliver the Tender Box to the tender opening room where it will be publicly opened by the Tender Opening Committee.

2.8.02 Tender Opening Process

All Tenders shall be removed from Tender Box, opened, evaluated pursuant to Section 2.8.03, then read and recorded by the Tender Opening Committee in public at the Tender Opening Location. The Tender Opening Committee shall open each Tender individually. The Tender Opening Committee will conduct the evaluation of the Tenders in two stages.

2.8.03 Stage 1: Evaluation of Mandatory Requirements

Stage 1 will consist of a review to determine which Tenders comply with all of the mandatory requirements. Tenders which do not comply with all of the mandatory requirements set out below, shall be Disqualified and not evaluated further.

Tenders shall be deemed as not complying with the mandatory requirements where:

a) The Tender is not in a sealed envelope which bears on its face the full legal name and address of the Tenderer, the Tender number, Title of Work and Tender Closing date and time.

b) The Tender is illegible or its pricing terms or conditions cannot be understood by the Tendering Opening Committee.

c) Where it is a Tender for more than one item and where it is required that all items be bid, there is a failure to bid an item or it does not contain a unit price or extended total of all items to be bid.

d) The Tender contains a bid on an item not included in the *Schedule of Quantities and Unit Prices*.

e) The Tender does not contain the total tender price, the unit prices or the fixed price written in words or does not have the words “dollars” and, where applicable, “cents” set out in the written total tender price, unit prices or fixed price on the *Schedule of Quantities and Unit Prices*.

f) The Tender is not accompanied by the required Tender (Bid) Bond or certified cheque pursuant to section 2.6.02 c).

g) The Tender does not include a fully completed prescribed Form of Tender, signed by an authorized agent, which bears the Tenderer’s corporate seal, pursuant to section 2.6.02 a) and Division 4.

h) The Tender does not include all required documents specified in the Form of Tender, does not comply with the provisions of the Tender Documents, or does not include the signature page(s) of all addenda issued to the Tenderers signed by the Tenderer.

i) The Form of Tender contains a change in price that is not initialed by the person signing the Form of Tender.

2.8.03 Stage 1: Evaluation of Mandatory Requirements (Cont'd)

j) The Tender contains an unsolicited alternative or a qualification to the terms of the Tender Documents.

Tenders which are Disqualified by the Tender Opening Committee will be returned to the Tenderer at the address contained in the Tender or in person if the Tenderer is present at the Tender Opening. Tender Prices of Disqualified Tenders will not be announced at the Tender Opening.

2.8.04 Stage 2: Evaluation of Tender Price

Stage 2 will consist of a recording of the Tender Prices by the Tender Opening Committee.

2.8.05 Selection of the Successful Tenderer

At the conclusion of Stage 1 and Stage 2 of the evaluation process and, subject to the approval of selection by Common Council and the reserved rights of the City, the selected Tenderer will enter into the Contract, as set out in the Tender Documents.

2.9 NOTICE OF SELECTION AND EXECUTION OF CONTRACT

2.9.01 Selection of Tenderer

Notice of selection by the City to the selected Tenderer will be in writing. Within five (5) Working Days following the City's notice of selection, the Tenderer shall provide to the City:

a) those items listed at section 6.8.04 ("Insurance Policies and Certificates");

b) an executed Form of Agreement (Division 5); and

c) the required Performance Guarantees pursuant to section 2.2.06

This provision is solely to the benefit of the City and may be waived by the City at its sole discretion.

2.9.02 Over-Budget Bids

If the Tender Price of the lowest compliant Tender exceeds the City's project budget or the Engineer's estimate for the Project, the City may proceed with negotiations with the lowest compliant Tenderer. Said negotiations shall be conducted within a prescribed timeframe to identify changes in scope and/or quantities of work, in exchange for a corresponding bid price reduction. Where the City and lowest compliant Tenderer establish acceptable changes and a corresponding bid price reduction, those changes shall be documented as post-bid addendum.

2.9.02 Over-Budget Bids (Cont'd)

Any such negotiations or resulting recommendations shall be conditional and subject to the approval of Common Council and, in accordance with the Limitation of Liability and Waiver set out in section 2.12 below, there shall be no liability resulting from any failure to award a contract.

Where acceptable changes and a corresponding bid price reduction cannot be successfully negotiated with the lowest compliant Tenderer, the City may proceed with a new tender call at a later date.

2.9.03 Failure to Enter Into the Contract

In addition to all of the City's other remedies, such as the enforcement of the Tender (Bid) Bond, if a selected Tenderer fails to execute the Contract, or satisfy any of the applicable conditions set out above at section 2.9.01 within five (5) Working Days of the notice of selection, the City may, in its sole and absolute discretion and without incurring any liability rescind the selection of the Tenderer and proceed with the selection of the next lowest compliant Tenderer.

2.10 CONFIDENTIAL INFORMATION AND MEDIA COMMUNICATIONS

2.10.01 Tenderer's Confidential Commercial Information

The City is committed to an open and transparent Tendering Process while understanding the Tenderers' need for protection of confidential commercial information. To assist the City in meeting this commitment, Tenderers will cooperate and extend all reasonable accommodation to this endeavour.

2.10.02 Tenderer Not to Communicate with Media and Public

To ensure that all public information generated about the Work is fair and accurate, and will not inadvertently or otherwise influence the outcome of the Tendering Process, all public information generated in relation to the Work, including communications with the media and the public, must be coordinated with, and is subject to the prior approval of, the City.

Tenderers will notify the City of requests for information or interviews from the media.

Tenderers will ensure that all of the Tenderers' Subcontractors and others associated with the Tenderer comply with the foregoing requirements.

2.11 RESERVED RIGHTS

The City reserves the right to:

a) Reject an unbalanced Tender. For the purpose of this section, an unbalanced tender is a tender containing a unit price which deviates substantially from, or does not fairly represent reasonable and proper compensation for the unit of work bid or one that contains prices which appear to be so unbalanced as to adversely affect the interests of the City. The City reserves the right to use tenders submitted in response to this Request for Tender or for other like or similar work as a guideline in determining if a bid is unbalanced.

2.11 RESERVED RIGHTS (Cont'd)

b) Amend or modify the scope of the Work, and/or cancel or suspend the Tender award, at any time for any reason;

c) Require Tenderers to provide additional information after the Tender Closing to support or clarify their Tender;

d) Not accept any or all Tenders;

e) Not accept a Tender from a Tenderer who is itself, or whose principals, owners or directors are also principals, owners or directors of another entity which is, involved in litigation, arbitration or any other similar proceeding against the City;

f) Reject any or all Tenders without any obligation, compensation or reimbursement to any Tenderer or any of its team members;

g) Withdraw this Request for Tender and cancel or suspend the Tendering Process;

h) Extend, from time to time, any date, any time period or deadline provided in this Tender (including, without limitation, the Tender Closing), upon written notice to all Tenderers;

i) Assess and reject a Tender on the basis of:

(i) information provided by references;
(ii) the Tenderer's past performance on previous contracts;
(iii) the information provided by a Tenderer pursuant to the City exercising its clarification rights under this Tendering Process;
(iv) the Tenderer's experience with performing the type and scope of work specified including the Tenderer's experience as a general contractor;
(v) other relevant information that arises during this Tendering Process.

j) Waive formalities and accept Tenders which substantially comply with the requirements of this Request for Tender;

k) Verify with any Tenderer or with a third party any information set out in a Tender;

l) Disqualify any Tenderer whose Tender contains misrepresentations or any other inaccurate or misleading information;

m) Disqualify any Tenderer who has engaged in conduct prohibited by the Tender Documents;

n) Disqualify any Tenderer who is guilty of an offence listed in Schedule C of the New Brunswick Regulation 2014-93 under the Procurement Act;

o) Disqualify any Tenderer for documented significant or persistent deficiencies in fulfilling or performing a substantive requirement or obligation under a prior contract or contracts. The disqualification for past performance shall be conducted in accordance with sections 64 thru 81 of the New Brunswick Regulation 2014-93 under the Procurement Act;

2.11 RESERVED RIGHTS (Cont'd)

p) Make changes, including substantial changes, to the Tender Documents provided that those changes are issued by way of addenda in the manner set out in these Instructions to Tenderers;

q) Select any Tenderer other than the Tenderer whose Tender reflects the lowest cost to the City;

r) Cancel this Tendering Process at any stage, for any reason;

s) Cancel this Tendering Process at any stage and issue a new Request for Tender for the same or similar deliverables;

t) Accept any Tender in whole or in part; or

u) Accept a Tender which contains the following errors:

(i) error in mathematics – whether this involves the extension of a unit price or an error in addition, the mistake will be corrected and the correct total will be used for evaluation purposes and will be binding on the Tenderer.

(ii) conflict between the written and numerical bid prices. In all cases, the total bid price will be corrected to reflect the written bid price, whether lump sum or unit price.

(iii) failure to include the contingency allowance in the total Tender Price. If the contingency allowance was not included in the addition, the Tender Price shall be corrected to reflect its inclusion.

and these reserved rights are in addition to any other express rights or any other rights which may be implied in the circumstances and the City shall not be liable for any expenses, costs, losses or any direct or indirect damages incurred or suffered by any Tenderer or any third party resulting from the City exercising any of its express or implied rights under this Request for Tender.

By submitting a Tender, the Tenderer authorizes the collection by the City of the information set out at paragraph 2.11 i) in the manner contemplated in that subparagraph.

2.12 LIMITATION OF LIABILITY AND WAIVER

Each Tenderer, by submitting a Tender, agrees that:

a) Neither the City nor any of its employees, agents, advisors or representatives will be liable, under any circumstances, for any Claim arising out of this Tendering Process including but not limited to costs of preparation of the Tender, loss of profits, loss of opportunity or for any other Claim; and

b) The Tenderer waives any Claim for any compensation of any kind whatsoever, including Claims for cost of preparation of the Tender, loss of profit or loss of opportunity by reason of the City's decision to not accept the Tender submitted by the Tenderer, to award a Contract to any other Tenderer or to cancel this Tendering Process, and the Tenderer shall be deemed to have agreed to waive such right or Claim.

2.13 INVOICES

a) In light of the requirements of Section 169 of the *Excise Tax Act*, R.S.C. 1985,c. E-15, and amendments thereto, the selected Tenderer shall provide to the City properly documented invoices with all requests for payments. This includes a government issued business number and the amount of tax included on the invoice.

b) Failure to provide properly documented invoices may result in delays in processing payments or outright rejection of the payment request.

City of Saint John

CONTRACT SPECIFICATIONS

DIVISION 3

PARTICULAR SPECIFICATIONS

City of Saint John

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DIVISION 3 – PARTICULAR SPECIFICATIONS

PARTICULAR SPECIFICATIONS

This division shall be read in conjunction with and take precedence where they may prove at variance with the City of Saint John, General Specifications.

3.1 SPECIFICATIONS FOR THIS PROJECT

See Attached

PART 1 - GENERAL

1.1 WORK COVERED BY CONTRACT DOCUMENTS

.1 The work under this contract includes the work and procedures associated with the CAER Simulation Room located at 45 Leinster Street, Saint John, NB. The work is to include the coordination, supply and installation of all improvements necessary to complete the following project in full as per the drawings and specifications:

- .1 Project Title: CAER Simulation Room
  Fire Station No. 1
  45 Leinster Street, Saint John NB
- .2 Construct work under single price contract.
- .3 Partial Owner's occupancy: Carry out work in a manner to keep disruption of normal building activities minimized.
  - .1 Fire Station No. 1 is to remain fully operational and secure throughout the duration of the work of this contract. Protect existing finishes to remain, building personnel, users and visitors from exposure to construction processes, materials as well as odours, dust and debris.
  - .2 This Contractor will schedule/coordinate all work to be performed with the Division Chief – Fire Prevention and Investigation as the Project Manager and the Architect.

.2 The work under this contract includes, but is not limited to the following:

- .1 Construct temporary barriers/walls as necessary to facilitate the separating of the construction areas from occupied areas ensuring containment of dust and debris.
- .2 Supply all labour and materials necessary to complete the work as described on the drawings and in the specifications.
- .3 Include within the architectural scope of work;
  - .1 removal of existing identified walls and provision for construction of new walls
  - .2 removal of existing doors, frames and hardware and provision for new doors, frames and hardware as scheduled
  - .3 removal of existing flooring and provision for installation of new flooring
  - .4 modifications to and replacement of existing ceiling grid and tiles as indicated
  - .5 removal of existing direct loose placed insulation from above Acoustic Ceiling and placement with spray foam insulation and thermal barrier to underside of roof deck and down exterior sidewall 500mm. Cover spray foam insulation with 20 minute thermal barrier
  - .6 removal of existing washroom fixtures and accessories and replacement with new washroom fixtures and accessories
  - .7 provide Plexiglas sneeze guards at locations shown on drawings
  - .8 provide tectum panel dividers at locations shown on drawings
- .4 Provide for Mechanical and Electrical improvements as described in the associated Mechanical and Electrical drawings and specifications.
- .7 Schedule of Work is to incorporate specific requirements of the City of Saint John (CoSJ) and the CoSJ Fire Department.
- .8 Supply and install all materials, labour and equipment required to construct the scheduled improvements as noted on drawings and described in the specifications.
- .9 Clean all work areas complete as the work of each aspect of the work is completed.
- .10 Complete all specified administrative requirements.

1.2 CONTRACTORS USE OF PREMISES

.1 Installation/Removal
- .1 Provide construction facilities and temporary controls in order to execute work expeditiously.
- .2 Remove from site all such work after use.

.2 Site Storage/Loading
- .1 Confine the Work and operations of employees to limits indicated by Contract Documents and as designated at the start-up meeting. Do not unreasonably encumber site with Products.
- .2 Do not load or permit to be loaded any part of the Work with a weight or force that will endanger the Work.

.3 Sanitary Facilities
- .1 Contractor to provide, maintain and clean portable sanitary facilities during construction unless otherwise agreed and documented within Project Minutes.

.4 Water Supply
- .1 Existing potable water supply as designated may be used during construction period.

.5 Temporary Power
- .1 Contractor to provide for temporary power required during construction for temporary lighting and operating of power tools unless otherwise agreed and documented within Project Minutes.

1.3 DOCUMENTS REQUIRED

.1 Maintain at job site, one copy of each of the following:
- .1 Contract drawings.
- .2 Specifications.
- .3 Set of documents for recording changes or deviation from drawings.
- .4 Reviewed shop drawings.
- .5 Change orders.
- .6 Modifications to Contract.
- .7 Copy of approved work schedule.
- .8 Manufacturers installation and/or application instructions.
- .9 Manufacturers MSDS product sheets.
- .10 CoSJ Covid-19 protocols.

1.4 PROJECT COORDINATION

.1 Coordinate progress of the Work, Work schedules, submittals, use of site, temporary utilities, construction facilities and controls and material and equipment location.

.2 Work on this project is to begin immediately following award of contract.

.3 Schedule verification of site dimensions, shop drawing review and ordering of materials before work commences on site so that no delays will occur.

.4 Coordinate with the Division Chief – Fire Prevention and Investigation as the Project Manager regarding work of associated contract for work being completed by others

1.5 CUTTING AND PATCHING

.1 Approvals
- .1 Submit written request in advance of cutting or alteration which affects:
  - .1 Structural integrity of any element of Project.
  - .2 Efficiency, maintenance, or safety of any operational element.
  - .3 Visual qualities of sight-exposed elements.

.2 Inspection
- .1 Inspect existing conditions, including elements subject to damage or movement during cutting and patching.
- .2 After uncovering, inspect conditions affecting performance of work.
- .3 Beginning of cutting or patching means acceptance of existing conditions.

.3 Execution
- .1 Perform cutting, fitting, and patching to complete the Work.
- .2 Remove and replace defective and non-conforming work.
- .3 Perform work to avoid damage to other work.
- .4 Prepare proper surfaces to receive patching and finishing.
- .5 Cut rigid materials using power saw or core drill. Pneumatic or impact tools not allowed. Do not use power tools for masonry repair and repointing procedures.
- .6 Restore work with new products in accordance with Contract Documents.
- .7 Refinish surfaces to match adjacent finishes; for continuous surfaces refinish to nearest intersection; for an assembly, refinish entire unit.

.4 Record Drawings
- .1 After award of Contract, Project Manager will provide 2 sets of white print drawings for purpose of maintaining record drawings. Using RED INK, accurately and neatly record deviations from Contract Documents caused by site conditions and changes ordered by Architect.
- .2 Identify drawings as "Project Record Copy". Maintain in new condition and make available for inspection on site, and at all job meetings, by Architect and/or Consultants.
- .3 On completion of Work and **prior to Substantial Completion Inspection**, submit complete and comprehensive record documents (Drawings and Specifications) to Architect for preparation of "AS BUILTS".

1.6 SITE INSTRUCTION

.1 When a clarification or modification of the Work is required which does not require an adjustment of the Contract Price or Contract Time, the Architect will issue a Site Instruction.

.2 Upon receipt of a Site Instruction, the Contractor to proceed promptly with the Work.

1.7 VALUATION OF CHANGES IN THE WORK

.1 The value of any changes in the work will be determined in one or more of the following ways, as determined by the Architect:
- .1 Lump Sum: An agreement between the Architect and the Contractor on a fixed price.
- .2 Cost Plus: Cost of work and percentage; or cost and fixed fee.

.2 When determining costs using the Lump Sum or Cost Plus method, the Contractor to submit an itemized account of the cost of expenditures and savings that includes, but is not limited to, the subcontractors' and suppliers' signed quotations and breakdown estimates for material and labour (i.e. itemized materials lists and labour, including labour rates and number of hours to perform work).

.3 When determining costs using the Lump Sum or Cost Plus method, the itemized account to include all documents and supporting data required to certify the adjustments to the Contract Price, as determined by the Architect.

.4 For changes where the individual trade cost is anticipated to be less than $1,000.00, the requirement for the itemized account may be waived, however individual trade quotations must be supplied.

.5 If appropriate submittals are not provided as required above, the Architect, the Architect's sub-consultants nor Owner will be held responsible for costs of delays associated with this Work.

1.8 MARKUP PERCENTAGES

.1 When determining costs using the Lump Sum or Cost Plus method, markup:

.1 Contract Price adjustment of $2,500.00 or less

Work completed by Contractor's own forces - 20%
Completed by subcontractor - 10%
(No markup to be applied to deductions)

.2 Contract Price adjustment over $2,500.00

Work completed by Contractor's own forces - 15%
completed by subcontractor - 5%
(No markup to be applied to deductions)

.2 Markup Costs:

.1 Included within the mark-up percentages are all overhead costs such as safety, all office costs, project management, change estimating, as-built, office supplies, courier as well as profit.

1.9 QUALITY CONTROL

.1 Inspection

.1 Architect, Mechanical and Electrical Consultants and Division Chief – Fire Prevention and Investigation shall have access to the Work throughout the duration of the work.

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

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

1.10 CONSTRUCTION FACILITIES AND TEMPORARY CONTROLS

.1 Project Cleanliness

.1 Maintain Work in tidy condition, free of accumulation of waste products and debris.

.2 Remove waste material and debris from site at end of each working shift. Clean area surrounding work area of dust at end of each working shift.

.3 Clean interior areas prior to start of finish work, maintain areas free of dust and other contaminants during finishing operations.

1.11 PROJECT CLOSEOUT

.1 Final Cleaning

.1 When each portion of the work is Substantially Performed and inspected, remove surplus products, tools construction machinery and equipment not required for performance of remaining Work.

.2 Remove waste materials and debris from site at regularly scheduled times. Do not interfere with the normal operations of Fire Station No. 1. Do not burn waste materials on site.
.3 Leave work broom clean before inspection process commences.
.4 Remove dirt and other disfigurations from exterior surfaces.

.2 Documents
.1 Collect reviewed submittals and assemble documents executed by Subcontractors, suppliers, and manufacturers.
.2 Submit material prior to final Application for Payment.
.3 Submit operation and maintenance data, record (project record copies) drawings.
.4 Provide warranties and bonds fully executed and notarized.
.5 Execute transition of Performance and Labour and Materials Payment Bond to warranty period requirements.
.6 Submit a final statement of accounting giving total adjusted Contract Price, previous payments, and monies remaining due.
.7 Architect/ Division Chief – Fire Prevention and Investigation as the Project Manager will issue a final change order reflecting approved adjustments to Contract Price not previously made.

1.12 INSPECTION AND DECLARATION PROCEDURES

.1 Contractor's Inspections: Contractor and all Subcontractors shall conduct inspections of the Work, identify deficiencies and defects; repair as required to conform to Contract Documents. Notify Architect in writing of satisfactory completion of Contractor's Inspection and that corrections have been made. The Contractor may then request the Architect to perform an interim completion inspection for the identified phase of the work.

.2 Interim Completion Inspection of December 11, 2020: The work of the contract will require an interim inspection directly associated with the completion of preparatory work associated with scheduled on-site installations and completion of related work of 3rd party contractor Environmental Techtronics Corporation (ETC). As such, architectural, mechanical and electrical work within the CAER space is to be given priority over completion of work in other spaces to ensure a completion of work within the CAER space enabling the turnover of the CAER space to ETC for the completion of their installations and related activities. The work areas will not be available to the General Contractor nor its Sub-Contractors from 8am December 15 and 5pm December 18. Any and all deficiencies related to the preparatory work associated with the readiness of the space for the work of ETC is to be fully completed prior to the occupancy of the space by ETC and as such may require work over the weekend and beyond normal work hours, at no additional cost to the Owner, to ensure completion.

Coordination with the Division Chief – Fire Prevention and Investigation as the Project Manager is required to enable a full understanding of identifiable segments of the work requiring completion for the Interim Completion Inspection of December 11, 2020.

.3 Interim Certificate of Completion at Substantial Completion: Upon completion of the interim inspection for substantial completion, if Architect is satisfied that work is substantially completed and acceptable for use, he may issue an Interim Certificate of Completion, describing portions of work not completed to his satisfaction. Completion of Interim Certificates of Completion will not constitute Substantial Completion of the Work and the commencement of the Mechanic's Lien period.

.4 Final Completion when Architect considers final deficiencies and defects have been corrected and it appears requirements of contract have been totally performed he may issue to the contractor a final certificate of completion.

.5 Interim Occupancy:

.1 On a project, which has a renovation and/or addition component with the Contractor required to complete and turn over areas in order to facilitate the users operations before undertaking work in another area, the turning over of the completed or partially completed area shall not constitute interim completion of the contract of the area involved.

.2 If tendered as a phased work, the occupying of a completed or partially completed area will be preceded by an occupancy inspection at which time the Architect shall list all deficiencies to the Work and advise Contractor accordingly. The user shall carry out and be responsible for day to day maintenance on the area that is occupied.

.6 Interim/Final Certificates of Completion: If the Architect does not find the Work to be substantially completed and an Interim/Final Certificate is not issued, the costs associated with extra inspections shall be borne by the Contractor.

.7 Commencement of Lien and warranty periods: all lien and warranty periods shall commence at date of Substantial Completion Certificate of Completion.

END OF SECTION

PART 1– GENERAL

1.1 ACCESS AND EGRESS

.1 Design, construct and maintain temporary "access to" and "egress from" work areas independent of finished surfaces and in accordance with relevant municipal, provincial and other regulations.

.2 Ensure temporary barrier is occupying least amount of area to perform construction work and does not interfere with daily functions of building employees and users.

.3 The existing dormitory room is to remain active throughout the construction and as such, a safe and unobstructed access route to the existing stair is to be maintained by the Contractor to the greatest extent possible throughout construction.

1.2 USE OF SITE AND FACILITIES

.1 Execute work with least possible interference with normal use of premises. Arrange with Division Chief – Fire Prevention and Investigation to resolve potential conflicts.

.2 Maintain existing services to building and provide for personnel and vehicle access.

.3 Where security is reduced by work provide temporary means to maintain security.

.4 Closures: protect work temporarily until permanent enclosures are completed.

1.3 ALTERATIONS, ADDITIONS OR REPAIRS TO EXISTING BUILDING

.1 Execute work with least possible interference or disturbance to building operations occupants, public and normal use of premises.

1.4 EXISTING SERVICES

.1 Construct barriers in accordance with Section 01 56 00 - Temporary Barriers and Enclosures.

1.5 SPECIAL REQUIREMENTS

.1 Paint public or occupied areas from 7:00PM to 07:00AM only or as otherwise agreed to by the Division Chief – Fire Prevention and Investigation as the Project Manager.

.2 Carry out noise generating Work from 7:00PM to 07:00AM only or as otherwise agreed to by the Division Chief – Fire Prevention and Investigation as the Project Manager.

.3 Submit schedule showing work broken down as to item, duration, location and division.

.4 Ensure that Contractor personnel employed on site become familiar with and obey regulations including safety, Covid-19 safety, fire, traffic and security regulations.

.5 Keep within limits of work and designated avenues of ingress and egress.

.6 Limited parking/storage areas are available adjoining the facility and can be used only as directed by the Division Chief – Fire Prevention and Investigation.

1.6 BUILDING SMOKING ENVIRONMENT

.1 Comply with smoking restrictions. Smoking is not allowed in this building.

END OF SECTION

PART 1 GENERAL

1.1 ADMINISTRATIVE

.1 Schedule and administer project meetings, subsequent to the initial project start-up meeting, throughout the progress of the work at the call of Division Chief – Fire Prevention and Investigation and the Architect.

.2 Prepare agenda for meetings.

.3 Distribute written notice of each meeting four days in advance of meeting date to Division Chief – Fire Prevention and Investigation as the Project Manager and Architect.

.4 Provide physical space and make arrangements for meetings.

.5 Preside at meetings.

.6 Record the meeting minutes. Include significant proceedings and decisions. Identify 'actions by' parties.

.7 Reproduce and distribute copies of minutes within three days after meetings and transmit to meeting participants, affected parties not in attendance, Division Chief – Fire Prevention and Investigation as the Project Manager and Architect.

.8 Representative of Contractor, Subcontractor and suppliers attending meetings will be qualified and authorized to act on behalf of party each represents.

1.2 PRECONSTRUCTION MEETING

.1 Within 15 days after award of Contract, request a meeting of parties in contract to discuss and resolve administrative procedures and responsibilities.

.2 Senior representatives of the Fire Department, Richard & Co. Architecture, the Contractor, major Subcontractors, field inspectors and supervisors will be in attendance.

.3 Establish time and location of meeting and notify parties concerned minimum 5 days before meeting.

.4 Incorporate mutually agreed variations to Contract Documents into Agreement, prior to signing.

.5 Agenda to include:

- .1 Appointment of official representative of participants in the Work.
- .2 Schedule of Work:
  Construction Progress Schedule - Critical Path Method (CPM).
  Progress of work pertaining to scheduled December 11 Interim Inspection.
- .3 Schedule of submission of shop drawings, samples, colour chips. Submit submittals in accordance with Section 01 33 00 - Submittal Procedures.
- .4 Requirements for temporary facilities, site sign, offices, dumpster, storage sheds, utilities, fences in accordance with Section 01 52 00 - Construction Facilities.
- .5 Delivery schedule of specified equipment and materials.
- .6 Site security in accordance with Section 01 56 00 - Temporary Barriers and Enclosures.
- .7 Proposed changes, change orders, procedures, approvals required, mark-up percentages permitted, time extensions, overtime, administrative requirements.
- .8 Owner provided products.
- .9 Record drawings in accordance with Section 01 33 00 - Submittal Procedures.
- .10 Maintenance manuals in accordance with Section 01 78 00 - Closeout

Submittals.

.11 Take-over procedures, acceptance, warranties in accordance with Section 01 78 00 - Closeout Submittals.

.12 Monthly progress claims, administrative procedures, photographs, hold backs.

.13 Appointment of inspection and testing agencies or firms.

.14 Insurances, transcript of policies.

1.3 PROGRESS MEETINGS

.1 During course of Work and two weeks prior to project completion, schedule progress meetings bi-weekly.

.2 Schedule a meeting for December 11 in association with Interim Inspection.

.3 Contractor, major Subcontractors involved in Work and Division Chief – Fire Prevention and Investigation as the Project Manager and Architect are to be in attendance.

.4 Notify parties minimum 4 days prior to meetings.

.5 Record minutes of meetings and circulate to attending parties and affected parties not in attendance within 3 days after meeting.

.6 Agenda to 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 which impede construction schedule.

.5 Review of off-site fabrication delivery schedules.

.6 Corrective measures and procedures to regain projected schedule.

.7 Revision to construction schedule.

.8 Progress schedule, during succeeding work period.

.9 Review submittal schedules: expedite as required.

.10 Maintenance of quality standards.

.11 Review proposed changes for effect on schedule and on completion dates.

.12 Other business.

PART 2 PRODUCTS

2.1 NOT USED

PART 3 EXECUTION

3.1 NOT USED

END OF SECTION

1 GENERAL

1.1 RELATED REQUIREMENTS

.1 Specification Sections associated with CAER Simulation Room, Fire Station No. 1.

1.2 DEFINITIONS

.1 Activity: element of Work performed during course of Project. Activity normally has expected duration, and expected cost and expected resource requirements. Activities can be subdivided into tasks.

.2 Bar Chart (GANTT Chart): graphic display of schedule-related information. In typical bar chart, activities or other Project elements are listed down left side of chart, dates are shown across top, and activity durations are shown as date-placed horizontal bars. Generally Bar Chart should be derived from commercially available computerized project management system.

.3 Baseline: original approved plan (for project, work package, or activity), plus or minus approved scope changes.

.4 Construction Work Week: Monday to Friday, inclusive, will provide five day work week and define schedule calendar working days as part of Bar (GANTT) Chart submission.

.5 Duration: number of work periods (not including holidays or other nonworking periods) required to complete activity or other project element. Usually expressed as workdays or workweeks.

.6 Master Plan: summary-level schedule that identifies major activities and key milestones.

.7 Milestone: significant event in project, usually completion of major deliverable.

.8 Project Schedule: planned dates for performing activities and the planned dates for meeting milestones. Dynamic, detailed record of tasks or activities that must be accomplished to satisfy Project objectives. Monitoring and control process involves using Project Schedule in executing and controlling activities and is used as basis for decision making throughout project life cycle.

.9 Project Planning, Monitoring and Control System: overall system operated by Division Chief – Fire Prevention and Investigation and Architect to enable monitoring of project work in relation to established milestones.

1.3 REQUIREMENTS

.1 Ensure Master Plan and Detail Schedules are practical and remain within specified Contract duration.

.2 Plan to complete Work in accordance with prescribed milestones and time frame.

.3 Limit activity durations to maximum of approximately 10 working days, to allow for progress reporting.

.4 Ensure that it is understood that Award of Contract or time of beginning, rate of progress, Interim Certificate and Final Certificate as defined times of completion are of essence of this contract.

1.4 ACTION AND INFORMATIONAL SUBMITTALS

.1 Provide submittals in accordance with Section 01 33 00 - Submittal Procedures.

.2 Submit to Division Chief – Fire Prevention and Investigation and Architect within 5 working days of Award of Contract Bar (GANTT) Chart as Master Plan for planning, monitoring and reporting of project progress.

.3 Submit Project Schedule to Division Chief – Fire Prevention and Investigation and Architect within 5 working days of receipt of acceptance of Master Plan.

1.5 PROJECT MILESTONES

.1 Project milestones form interim targets for Project Schedule.

.1 Interim Inspection December 11, 2020 associated with predatory work ensuring accommodation of ETC requirements.

.2 Interim Certificate (Substantial Completion) within 45 working days of Award of Contract date.

1.6 MASTER PLAN

.1 Structure schedule to allow orderly planning, organizing and execution of Work as Bar Chart (GANTT).

.2 Division Chief – Fire Prevention and Investigation and Architect will review and return revised schedules within 5 working days.

.3 Revise impractical schedule and resubmit within 5 working days.

.4 Accepted revised schedule will become Master Plan and be used as baseline for updates.

1.7 PROJECT SCHEDULE

.1 Develop detailed Project Schedule derived from Master Plan.

.2 Ensure detailed Project Schedule includes milestones and activity types as follows:

.1 Award.
.2 Shop Drawings, Samples.
.3 Permits.
.4 Mobilization.
.5 Architectural, Mechanical and Electrical improvements.
.6 Testing of materials.
.7 Interim Inspection December 11, 2020.
.8 Substantial Completion.
.9 Demobilization and Final Cleaning.

1.8 PROJECT SCHEDULE REPORTING

.1 Update Project Schedule on weekly basis reflecting activity changes and completions, as well as activities in progress. Include as part of Project Schedule, narrative report identifying Work status to date, comparing current progress to baseline, presenting current forecasts, defining problem areas, anticipated delays and impact with possible mitigation.

1.9 PROJECT MEETINGS

.1 Discuss Project Schedule at regular site meetings, identify activities that are behind schedule and provide measures to regain slippage. Activities considered behind schedule are those with projected start or completion dates later than current approved dates shown on baseline schedule.

.2 Covid-19 related delays with their remedial measures will be discussed and negotiated.

2 PRODUCTS

2.1 NOT USED

.1 Not used.

3 EXECUTION

3.1 NOT USED

.1 Not used.

END OF SECTION

PART 1 - GENERAL

1.1 SUBMITTALS

.1 Administrative
- .1 Submit to Division Chief – Fire Prevention and Investigation as the Project Manager submittals listed for review. Submit with reasonable promptness and in an orderly sequence so as to not cause delay in the Work.
- .2 Work affected by submittal shall not proceed until review is complete.
- .3 Review and sign submittals prior to submission to Division Chief – Fire Prevention and Investigation as the Project Manager. This review represents that necessary requirements have been determined and verified, or will be, and that each submittal has been checked and co-ordinated with requirements of the Work and Contract Documents.
- .4 Verify field measurements and affected adjacent Work are co-ordinated.

.2 Shop Drawings and Product Data
- .1 "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 the Work.
- .2 Indicate materials, methods of construction and attachment or anchorage, erection diagrams, connection, explanatory notes and other information necessary for completion of Work.
- .3 Adjustments made on shop drawings by Division Chief – Fire Prevention and Investigation as the Project Manager and Architect are not intended to change Contract Price.
- .4 Make changes in shop drawings as Division Chief – Fire Prevention and Investigation as the Project Manager may require.
- .5 Submit STAMPED ELECTRONIC COPIES.
- .6 Submit STAMPED ELECTRONIC COPIES of product data sheets.

.3 Operating Maintenance Manuals
- .1 Two weeks prior to Substantial Performance of the Work, submit to Division Chief – Fire Prevention and Investigation as the Project Manager, one electronic copy of operating and maintenance manual for review. Modify operating maintenance manuals as required by review. Once approved 2 hard copies to be handed over.
- .2 Manuals to follow CoSJ Manual Guidelines.

.4 Record Drawings
- .1 After award of Contract, Architect will provide 2 sets of white print drawings for purpose of maintaining record drawings. Using RED INK, accurately and neatly record deviations from Contract Documents caused by site conditions and changes ordered by Architect/ Division Chief – Fire Prevention and Investigation as the Project Manager.
- .2 Record locations of concealed components of mechanical and electrical services.
- .3 Identify drawings as "Project Record Copy". Maintain in new condition and make available for inspection on site, and at all job meetings, by Division Chief – Fire Prevention and Investigation as the Project Manager.
- .4 On completion of Work and prior to Interim inspection associated with Substantial Completion, submit record documents to Architect/ Division Chief – Fire Prevention and Investigation as the Project Manager for preparation of "AS BUILT" transparencies.

1.2 MATERIALS AND EQUIPMENT

.1 Product and Material Quality

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

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

.3 Should any dispute arise as to quality or fitness of Products, decision rests strictly with Division Chief – Fire Prevention and Investigation based upon requirements of Contract Documents.

.2 Storage, Handling and Protection

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

.2 Store packaged or bundled Products in original and undamaged condition with manufacturer's seals and labels intact.

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

.3 Manufacturer's Instructions

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

.2 Notify Division Chief – Fire Prevention and Investigation in writing, of conflicts between specifications and manufacturer's instructions, so that Division Chief – Fire Prevention and Investigation as the Project Manager may establish course of action.

.3 Improper installation or erection of Products, due to failure in complying with these requirements, authorizes Division Chief – Fire Prevention and Investigation as the Project Manager to require removal and reinstallation at no increase in Contract Price.

.4 Workmanship

.1 Workmanship shall be best quality, executed by workers experienced and skilled in respective duties for which they are employed. Immediately notify Consultant if required Work is such as to make it impractical to produce required results.

.2 Do not employ any unfit/unskilled person in their required duties.

.3 Decisions as to quality or fitness of workmanship in cases of dispute rest solely with Division Chief – Fire Prevention and Investigation as the Project Manager, whose decision is final.

END OF SECTION

PART 1 GENERAL

1.1 RELATED REQUIREMENTS

.1 Specification sections associated with the CAER Simulation Room, Fire Station No. 1.

1.2 REFERENCE STANDARDS

.1 Canada Labour Code, Part 2, Canada Occupational Safety and Health Regulations

.2 Province of New Brunswick
- .1 Occupational Health and Safety Act, S.N.B.- Updated [2009].

1.3 ACTION AND INFORMATIONAL SUBMITTALS

.1 Submit in accordance with Section 01 33 00 - Submittal Procedures.

.2 Submit site-specific Health and Safety Plan: Within 7 days after date of Notice to Proceed and prior to commencement of Work. Health and Safety Plan must include:
- .1 Results of site specific safety hazard assessment.
- .2 Results of safety and health risk or hazard analysis for site tasks and operation.
- .3 Covid-19 safety plans based on CoSJ and Fire Department requirements

.3 Submit 3 copies of Contractor's authorized representative's work site health and safety inspection reports to Division Chief – Fire Prevention and Investigation as the Project Manager and Architect and authority having jurisdiction.

.4 Submit copies of reports or directions issued by Federal, Provincial and Territorial health and safety inspectors.

.5 Submit copies of incident and accident reports.

.6 Submit WHMIS Safety Data Sheets (SDS) in accordance with Section 01 33 00 – Submittal Procedures.

.7 Division Chief – Fire Prevention and Investigation as the Project Manager and Architect will review Contractor's site-specific Health and Safety Plan and provide comments to Contractor within 3 days after receipt of plan. Revise plan as appropriate and resubmit plan to Division Chief – Fire Prevention and Investigation as the Project Manager and Architect within 3 days after receipt of comments from Division Chief – Fire Prevention and Investigation as the Project Manager and Architect.

.8 Division Chief – Fire Prevention and Investigation Project Manager and Architect review of Contractor's final Health and Safety plan should not be construed as approval and does not reduce Contractor's overall responsibility for construction Health and Safety.

.9 Medical Surveillance: where prescribed by legislation, regulation or safety program, submit certification of medical surveillance for site personnel prior to commencement of Work, and submit additional certifications for any new site personnel to Division Chief – Fire Prevention and Investigation as the Project Manager and Architect.

.10 On-site Contingency and Emergency Response Plan: address standard operating procedures to be implemented during emergency situations.

1.4 FILING OF NOTICE

.1 File Notice of Project with Provincial authorities prior to beginning of Work.

.2 Contractor shall agree to install proper site separation and identification in order to

maintain time and space at all times throughout life of project.

1.5 SAFETY ASSESSMENT

.1 Perform site specific safety hazard assessment related to project.

1.6 MEETINGS

.1 Schedule and administer Health and Safety meeting with Division Chief – Fire Prevention and Investigation as the Project Manager and Architect prior to commencement of Work.

1.7 REGULATORY REQUIREMENTS

.1 Do Work in accordance with Section 01 41 00 - Regulatory Requirements.

1.8 PROJECT/SITE CONDITIONS

.1 Work at site will involve contact with:
  .1 Work at heights.
  .2 Work with chemicals.

1.9 GENERAL REQUIREMENTS

.1 Develop written site-specific Health and Safety Plan based on hazard assessment prior to beginning site Work and continue to implement, maintain, and enforce plan until final demobilization from site. Health and Safety Plan must address project specifications.

.2 Division Chief – Fire Prevention and Investigation as the Project Manager and Architect may respond in writing, where deficiencies or concerns are noted and may request re-submission with correction of deficiencies or concerns.

1.10 RESPONSIBILITY

.1 Be responsible for health and safety of persons on site, safety of property on site and for protection of persons adjacent to site and environment to extent that they may be affected by conduct of Work.

.2 Comply with and enforce compliance by employees with safety requirements of Contract Documents, applicable federal, provincial, territorial and local statutes, regulations, and ordinances, and with site-specific Health and Safety Plan.

1.11 COMPLIANCE REQUIREMENTS

.1 Comply with Occupational Health and Safety Act, General Regulation, N.B. Reg.

.2 Comply with Canada Labour Code, Canada Occupational Safety and Health Regulations.

1.12 UNFORSEEN HAZARDS

.1 When unforeseen or peculiar safety-related factor, hazard, or condition occur during performance of Work, advise Health and Safety Coordinator, Safety Officer and follow procedures in accordance with Acts and Regulations of Province having jurisdiction and advise Division Chief – Fire Prevention and Investigation as the Project Manager and Architect verbally and in writing.

1.13 HEALTH AND SAFETY CO-ORDINATOR

.1 Employ and assign to Work, competent and authorized representative as Health and Safety Coordinator. Health and Safety Coordinator must:
- .1 Have site-related working experience specific to activities associated with masonry restoration/restoration work at elevated heights.
- .2 Have working knowledge of occupational safety and health regulations.
- .3 Be responsible for completing Contractor's Health and Safety Training Sessions and ensuring that personnel not successfully completing required training are not permitted to enter site to perform Work.
- .4 Be responsible for implementing, enforcing daily and monitoring site-specific Contractor's Health and Safety Plan.

1.14 POSTING OF DOCUMENTS

.1 Ensure applicable items, articles, notices and orders are posted in conspicuous location on site in accordance with Acts and Regulations of Province having jurisdiction, and in consultation with Division Chief – Fire Prevention and Investigation as the Project Manager and Architect.

1.15 CORRECTION OF NON-COMPLIANCE

.1 Immediately address health and safety non-compliance issues identified by authority having jurisdiction or by Division Chief – Fire Prevention and Investigation as the Project Manager and Architect.

.2 Provide Division Chief – Fire Prevention and Investigation as the Project Manager and Architect with written report of action taken to correct non-compliance of health and safety issues identified.

.3 Division Chief – Fire Prevention and Investigation as the Project Manager and Architect may stop Work if non-compliance of health and safety regulations is not corrected.

1.16 WORK STOPPAGE

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

2 PRODUCTS

2.01 NOT USED

.1 Not used.

3 EXECUTION

3.1 NOT USED

.1 Not used.

END OF SECTION

PART 1 - GENERAL

1.1 REPORTING FIRES

.1 Know the location of the nearest fire alarm box and telephone, including the emergency phone number.

.2 Report immediately all fire incidents to the fire department as follows:
- .1 Activate nearest fire alarm box or telephone.

.3 Person activating fire alarm box will remain at the box to direct Fire Department to scene of fire.

.4 When reporting a fire by telephone, give location of fire, name and number of building and be prepared to verify location.

1.2 INTERIOR AND EXTERIOR FIRE PROTECTION AND ALARM SYSTEMS

.1 Fire protection and alarm system will not be:
- .1 obstructed;
- .2 shut-off; and
- .3 left inactive at the end of a working day or shift without authorization of the Fire Chief.

1.3 FIRE EXTINGUISHERS

.1 Supply fire extinguishers as scaled by the Fire Chief, necessary to protect, the work in progress and the Contractor's physical plant on site.

1.4 SMOKING PRECAUTIONS

.1 Smoking is not permitted.

1.5 RUBBISH AND WASTE MATERIALS

.1 Rubbish and waste materials are to be kept to a minimum.

.2 The burning of rubbish is prohibited.

.3 Removal:
- .1 Remove all rubbish from the work site at the end of the work day or as

.4 Storage:
- .1 Store oily waste in approved receptacles to ensure maximum cleanliness and safety.
- .2 Deposit greasy or oily rags and materials subject to spontaneous combustion in approved receptacles and remove as required.

1.6 FLAMMABLE AND COMBUSTIBLE LIQUIDS

.1 The handling, storage and use of flammable liquids are to be governed by the current National Fire Code of Canada.

.2 Flammable and combustible liquids such as gasoline, kerosene and naptha will be kept in ready use in quantities not exceeding 45 litres provided they are stored in approved safety cans bearing the Underwriter's Laboratory of Canada or Factory Mutual seal of approval.

Storage of quantities of flammable or combustible liquids exceeding 45 litres for work purposes, requires the permission of the Fire Chief.

1.7 HAZARDOUS SUBSTANCES

.1 Work entailing the use of toxic or hazardous materials, chemicals and/or explosives, otherwise creates a hazard to life, safety or health, will be in accordance with the National Fire Code of Canada.

.2 Obtain from Division Chief – Fire Prevention and Investigation as the Project Manager a "Hot Work" permit for work involving welding, burning or the use of blow torches and salamanders, in building or facilities.

.3 When work is carried out in dangerous or hazardous areas involving use of heat, provide fire watchers, equipped with sufficient fire extinguishers. Determination of dangerous or hazardous areas along with the level of protection necessary for Fire Watch is at the discretion of the Fire Chief. Contractors are responsible for providing fire watch service for work on a scale established and in conjunction with the Fire Chief at the pre-work conference.

END OF SECTION

PART 1 - GENERAL

1.1 SUBMITTALS

.1 Submittals: in accordance with Section 01 33 00 - Submittal Procedures.

.2 Prior to commencing construction activities or delivery of materials to site, submit Environmental Protection Plan for review and approval by Division Chief – Fire Prevention and Investigation as the Project Manager. Environmental Protection Plan is to present comprehensive overview of known or potential environmental issues which must be addressed during construction.

.3 Address topics at level of detail commensurate with environmental issue and required construction tasks.

.4 Environmental protection plan: include:

.1 Air pollution control plan detailing provisions to assure that dust, debris, materials, and trash, do not become air borne and travel off project site.

.2 Contaminant prevention plan that: identifies potentially hazardous substances to be used on job site; identifies intended actions to prevent introduction of such materials into air, water, or ground; and details provisions for compliance with Federal, Provincial, and Municipal laws and regulations for storage and handling of these materials.

1.2 FIRES

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

1.3 DISPOSAL OF WASTES

.1 Do not bury rubbish and waste materials on site.

.2 Do not dispose of waste or volatile materials, such as mineral spirits, oil or paint thinner into waterways, storm or sanitary sewers.

.3 Disposal of refrigerants is to be in strict accordance with published regulations and requirements of the NB Department of the Environment.

1.4 PLANT PROTECTION

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

1.5 NOTIFICATION

.1 Division Chief – Fire Prevention and Investigation as the Project Manager will notify Contractor in writing of observed noncompliance with Federal, Provincial or Municipal environmental laws or regulations.

.2 Contractor: after receipt of such notice, inform Architect/ Division Chief – Fire Prevention and Investigation as the Project Manager of proposed corrective action and take such action.

.3 Architect/ Division Chief – Fire Prevention and Investigation as the Project Manager will issue stop order of work until satisfactory corrective action has been taken.

.4 No time extensions granted or equitable adjustments allowed to Contractor for such suspensions.

END OF SECTION

PART 1 - GENERAL

.1 Perform Work in accordance with National Building Code of Canada (NBC) including amendments up to signing date and other codes of provincial or local application provided that in case of conflict or discrepancy, more stringent requirements apply.

.2 Meet or exceed requirements of:
- .1 Contract documents.
- .2 Specified standards, codes and referenced documents.

1.2 HAZARDOUS MATERIAL DISCOVERY

.1 Asbestos: demolition of spray or trowel-applied asbestos is hazardous to health. Stop work immediately when material resembling spray or trowel-applied asbestos is encountered during demolition work. Notify Division Chief – Fire Prevention and Investigation as the Project Manager / Architect.

.2 Mould: stop work immediately when material resembling mould is encountered during demolition work. Notify Division Chief – Fire Prevention and Investigation as the Project Manager / Architect.

1.3 BUILDING SMOKING ENVIRONMENT

.1 Comply with smoking restrictions and municipal by-laws.

END OF SECTION

PART 1 – GENERAL

1.1 INSPECTION

.1 Allow Architect/ Division Chief – Fire Prevention and Investigation as the Project Manager access to Work.

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

1.2 PROCEDURES

.1 Notify Architect/ Division Chief – Fire Prevention and Investigation as the Project Manager in advance of requirement for inspections, in order that attendance arrangements can be made.

1.3 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 Architect/ Division Chief – Fire Prevention and Investigation as the Project Manager as failing to conform to Contract Documents. Replace or re-execute in accordance with Contract Documents.

.2 If in opinion of Architect/ Division Chief – Fire Prevention and Investigation as the Project Manager it is not expedient to correct defective Work or Work not performed in accordance with Contract Documents, Owner will deduct from Contract Price difference in value between Work performed and that called for by Contract Documents, amount of which will be determined by Architect/ Division Chief – Fire Prevention and Investigation as the Project Manager.

1.4 REPORTS

.1 Submit 4 copies of inspection and test reports to Division Chief – Fire Prevention and Investigation as the Project Manager. Note requirement for report associated with mortar analysis.

END OF SECTION

PART 1 - GENERAL

1.1 SUBMITTALS

.1 Provide submittals in accordance with Section 01 33 00 - Submittal Procedures.

1.2 INSTALLATION AND REMOVAL

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

.2 Remove from site all such work after use.

1.3 SANITARY FACILITIES

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

.2 Existing services as designated may be used during construction period, if permission granted by Owner.

1.4 WATER SUPPLY

.1 Contractor/Owner will provide a continuous supply of potable water for construction use.

.2 Existing potable water supply as designated may be used during construction period, if permission granted by Owner.

1.5 TEMPORARY POWER AND LIGHT

.1 Division Chief – Fire Prevention and Investigation as the Project Manager will arrange with Owner for temporary power during construction for operating of power tools, to a maximum supply of 230 volts 30 amps.

1.6 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.

END OF SECTION

PART 1 – GENERAL

1.1 INSTALLATION AND REMOVAL

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

.2 Remove from site all such work after use.

1.2 SCAFFOLDING

.1 Scaffolding in accordance with CAN/CSA-S269.2.

.2 Provide and maintain scaffolding, ladders.

1.3 SITE STORAGE/LOADING

.1 Confine work and operations of employees by Contract Documents. Do not unreasonably encumber premises with products.

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

1.4 CONSTRUCTION PARKING

.1 No Contractor parking is available. Contractor is to make independent arrangements.

1.5 SECURITY

.1 Contractor will ensure the building remains secure throughout construction.

1.6 EQUIPMENT, TOOL AND MATERIALS STORAGE

.1 Provide and maintain, in 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 manner to cause least interference with work activities.

1.7 SANITARY FACILITIES

.1 Permanent facilities may be used on approval of Division Chief – Fire Prevention and Investigation as the Project Manager.

1.8 PROTECTION AND MAINTENANCE OF TRAFFIC

.1 Protect travelling public from damage to person and property.

1.9 CLEAN-UP

.1 Remove construction debris, waste materials, packaging material from work site daily.

END OF SECTION

PART 1 - GENERAL

1.1 RELATED SECTIONS

.1 Section 02 41 99 Demolition

1.2 DUST TIGHT SCREENS

.1 Provide dust tight screens to localize dust generating activities, and for protection of workers, existing equipment, finished areas of work and public areas.

.2 Maintain access egress to and from dormitory space throughout construction.

1.3 PUBLIC TRAFFIC FLOW

.1 Provide and maintain as required public walkways around construction areas to perform work and protect public.

.2 Do not obstruct walkways with stored materials or tools at any time.

1.4 FIRE ROUTES

.1 Maintain access around construction areas. Do not block established routes to fire exits.

1.5 PROTECTION FOR PUBLIC PROPERTY

.1 Protect surrounding areas from damage during performance of work.

.2 Be responsible for damage incurred.

1.6 PROTECTION OF BUILDING FINISHES

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

.2 Provide necessary screens, covers, and hoardings.

.3 Confirm with Architect/ Division Chief – Fire Prevention and Investigation as the Project Manager, locations and installation schedule prior to installation.

.4 Be responsible for damage and clean-up incurred due to lack of or improper protection.

END OF SECTION

PART 1 - GENERAL

1.1 REFERENCES

.1 Within text of each specifications section, reference may be made to reference standards.

.2 Conform to these reference standards, in whole or in part as specifically requested in specifications.

.3 If there is question as to whether products or systems are in conformance with applicable standards, Division Chief – Fire Prevention and Investigation as the Project Manager reserves the right to have such products or systems verified to prove or disprove conformance.

.4 Cost for such testing will be borne by Contractor in event of non-conformance.

1.2 QUALITY

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

.2 Procurement policy is to acquire, in cost effective manner, items containing percentage of recycled and recovered materials practicable consistent with maintaining satisfactory levels of competition. Make reasonable efforts to use recycled and recovered materials and in otherwise utilizing recycled and recovered materials in execution of work.

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

.4 Should disputes arise as to quality or fitness of products, decision rests strictly with Division Chief – Fire Prevention and Investigation as the Project Manager based upon requirements of Contract Documents.

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

1.3 AVAILABILITY

.1 Contract, review product delivery requirements and anticipate foreseeable supply delays for items. If delays in supply of products are foreseeable, notify Architect/ Division Chief – Fire Prevention and Investigation as the Project Manager of such, in order that substitutions or other remedial action may be authorized in ample time to prevent delay in performance of Work.

.2 In event of failure to notify Architect/ Division Chief – Fire Prevention and Investigation as the Project Manager at commencement of Work and should it subsequently appear that Work may be delayed for such reason, Architect/ Division Chief – Fire Prevention and Investigation as the Project Manager reserves right to substitute more readily available products of similar character, at no increase in Contract Price or Contract Time.

1.4 STORAGE, HANDLING AND PROTECTION

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

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

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

.4 Remove and replace damaged products at own expense and to satisfaction Division Chief – Fire Prevention and Investigation as the Project Manager.

1.5 TRANSPORTATION

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

1.6 MANUFACTURER'S INSTRUCTIONS

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

.2 Notify Architect/ Division Chief – Fire Prevention and Investigation as the Project Manager in writing, of conflicts between specifications and manufacturer's instructions, so that Architect/ Division Chief – Fire Prevention and Investigation as the Project Manager will establish course of action.

.3 Improper installation or erection of products, due to failure in complying with these requirements, authorizes Division Chief – Fire Prevention and Investigation as the Project Manager to require removal and re-installation at no increase in Contract Price or Contract Time.

1.7 QUALITY OF WORK

.1 Ensure Quality of Work is of the highest standard, executed by workers experienced and skilled in respective duties for which they are employed. Immediately notify Division Chief – Fire Prevention and Investigation as the Project Manager if required work is such as to make it impractical to produce required results.

.2 Do not employ anyone unskilled in their required duties. Division Chief – Fire Prevention and Investigation as the Project Manager reserves the right to require dismissal from site, workers deemed incompetent or careless.

.3 Decisions as to standard or fitness of Quality of Work in cases of dispute rest solely with Division Chief – Fire Prevention and Investigation as the Project Manager, whose decision is final.

1.8 CO-ORDINATION

.1 Ensure co-operation of workers in laying out Work. Maintain efficient and continuous supervision.

1.9 REMEDIAL WORK

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

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

1.10 PROTECTION OF WORK IN PROGRESS

.1 Prevent overloading of parts of building. Do not cut, drill or sleeve load bearing structural member, unless specifically indicated without written approval of Division Chief – Fire Prevention and Investigation as the Project Manager.

END OF SECTION

PART 1- GENERAL

1.1 EXISTING SERVICES

.1 Before commencing work, establish location and extent of service lines in area of Work and notify Division Chief – Fire Prevention and Investigation as the Project Manager of findings.

1.2 LOCATION OF EQUIPMENT AND FIXTURES

.1 Location of equipment, fixtures and outlets indicated or specified are to be considered as approximate.

.2 Locate equipment, fixtures and distribution systems to provide minimum interference and maximum usable space and in accordance with manufacturer's recommendations for safety, access and maintenance.

.3 Inform Division Chief – Fire Prevention and Investigation as the Project Manager of impending installation and obtain approval for actual location.

1.3 SUBSURFACE CONDITIONS

.1 Promptly notify Architect/ Division Chief – Fire Prevention and Investigation as the Project Manager in writing if subsurface conditions found during demolition at Place of Work differ materially from those indicated in Contract Documents, or a reasonable assumption of probable conditions based thereon.

END OF SECTION

PART 1 - GENERAL

1.1 SUBMITTALS

.1 Submittals: in accordance with Section 01 33 00 - Submittal Procedures.

.2 Submit written request in advance of cutting or alteration which affects:
- .1 Structural integrity of elements of project.
- .2 Integrity of weather-exposed or moisture-resistant elements.
- .3 Efficiency, maintenance, or safety of operational elements.
- .4 Visual qualities of sight-exposed elements.

1.2 MATERIALS

.1 Required for original installation.

.2 Change in Materials: Submit request for substitution in accordance with Section 01 33 00 - Submittal Procedures.

1.3 PREPARATION

.1 Inspect existing conditions, including elements subject to damage or movement during cutting and patching.

.2 After uncovering, inspect conditions affecting performance of Work.

.3 Beginning of cutting or patching means acceptance of existing conditions.

.4 Provide supports to assure structural integrity of surroundings; provide devices and methods to protect other portions of project from damage.

.5 Provide protection from elements for areas which are to be exposed by uncovering work; maintain excavations free of water.

1.4 EXECUTION

.1 Execute cutting, fitting, and patching to complete Work.

.2 Fit several parts together, to integrate with other Work.

.3 Remove and replace defective and non-conforming Work.

.4 Provide openings in non-structural elements of Work for penetrations of Mechanical and Electrical work.

.5 Execute Work by methods to avoid damage to other Work, and which will provide proper surfaces to receive patching and finishing.

.6 Restore work with new products in accordance with requirements of Contract Documents.

.7 Fit Work airtight to pipes, sleeves, ducts, conduit, and other penetrations through surfaces.

.8 Refinish surfaces to match adjacent finishes: Refinish continuous surfaces to nearest intersection. Refinish assemblies by refinishing entire unit.

.9 Conceal pipes, ducts and wiring in wall and ceiling construction of finished areas except where indicated otherwise.

END OF SECTION

PART 1 - GENERAL

1.1 GENERAL

.1 Conduct cleaning and disposal operations to comply with local ordinances and anti-pollution laws.

.2 Store volatile waste in covered metal containers, and remove from premises at end of each working day.

1.2 MATERIALS

.1 Use only cleaning materials recommended by manufacturer of surface to be cleaned, and as recommended by cleaning material manufacturer.

1.3 CLEANING DURING CONSTRUCTION

.1 Provide on-site containers for collection of waste materials, and debris.

.2 Dispose of waste materials, and debris at an approved regional landfill site.

.3 Schedule cleaning operations so that resulting dust, debris and other contaminants will not fall on wet, newly painted surfaces nor contaminate building systems.

1.4 FINAL CLEANING

.1 Remove grease, dust dirt, stains, labels, fingerprints, and other foreign materials, from interior and exterior finished surfaces including glass and other polished surfaces.

END OF SECTION

PART 1 - GENERAL

1.1 WASTE MANAGEMENT GOALS

.1 Prior to start of Work conduct meeting with Architect/ Division Chief – Fire Prevention and Investigation as the Project Manager to review and discuss Waste Management Plan and Goals.

.2 Waste Management Goal - 75 percent of total Project Waste to be diverted from landfill sites. Provide documentation certifying that waste management, recycling, and reusable is being practiced.

.3 Accomplish maximum control of solid construction waste.

1.2 RELATED SECTION

.1 Section 02 41 99 Demolition for Minor Works.

1.3 DOCUMENTS

.1 Maintain at job site, one copy of following documents:
- .1 Waste Reduction Workplan.

1.4 SUBMITTALS

.1 Submittals in accordance with Section 01 33 00 - Submittal Procedures.

.2 Prepare and submit following prior to project start-up:
- .1 Submit 2 copies of completed Waste Reduction Workplan (WRW): Schedule B.

.3 Submit before final payment summary of waste materials salvaged for reuse, recycling by project using (WRW) form.
- .1 Failure to submit could result in hold back of final payment.
- .2 Provide receipts, and show quantities and types of materials reused, recycled, or disposed of.

1.5 WASTE REDUCTION WORKPLAN (WRW)

.1 Prepare WRW prior to project start-up.

.2 WRW should include but not be limited to:
- .1 Destination of materials listed.
- .2 Clear labelling of storage areas.
- .3 Details on materials handling and removal procedures.
- .4 Quantities for materials to be salvaged for reuse or recycled and materials sent to landfill.

.3 Structure WRW to prioritize actions and follow 3R's hierarchy, with Reduction as first priority, followed by Reuse, then Recycle.

.4 Describe management of waste.

.5 Identify opportunities for reduction, reuse, and recycling of materials.

.6 Set realistic goals for waste reduction, recognize existing barriers and develop strategies to overcome these barriers.

1.6 STORAGE, HANDLING AND PROTECTION

.1 Store, materials to be reused, recycled and salvaged in locations as noted by

Contractor to Architect/ Division Chief – Fire Prevention and Investigation as the Project Manager.

.2 Unless specified otherwise, materials for removal become Contractor's property.

1.7 DISPOSAL OF WASTES

.1 Do not bury rubbish or waste materials.

.2 Do not dispose of volatile materials, mineral spirits, paint thinner into waterways, storm, or sanitary sewers.

.3 Keep records of construction waste including:
- .1 Total tonnage generated.
- .2 Tonnage reused or recycled.
- .3 Reused or recycled waste destination.

.4 Remove materials from Construction Site as work progresses.

.5 Prepare project summary to verify destination and quantities on a material-by-material basis as identified in pre-demolition material audit.

1.8 USE OF SITE AND FACILITIES

.1 Execute work with least possible interference or disturbance to normal use of premises.

.2 Maintain security measures established by existing facility.

1.9 SCHEDULING

.1 Co-ordinate Work with other activities at site to ensure timely and orderly progress of Work.

PART 2 - PRODUCTS

2.1 NOT USED

PART 3 - EXECUTION

3.1 APPLICATION

.1 Handle waste materials not reused, salvaged, or recycled in accordance with appropriate regulations and codes.

3.2 CLEANING

.1 Remove tools and waste materials on completion of Work, and leave work area in clean and orderly condition

.2 Clean-up work area as work progresses.

END OF SECTION

PART 1 - GENERAL

1.1 INSPECTION AND DECLARATION

.1 Contractor's Inspection:
- .1 Prior to requesting a substantial completion inspection of the work by the Architect and Sub-Consultants, the Contractor and Subcontractors are to conduct an inspection of the work to identify obvious defects or deficiencies.
- .2 Contractor and Sub-Consultants to correct work accordingly.
- .3 Following corrections of the Contractor identified defects and deficiencies, the Contractor is to request through the Division Chief – Fire Prevention and Investigation that a Substantial Completion Inspection be scheduled.

.2 Architects Inspection: Architect, Sub-Consultants, Division Chief – Fire Prevention and Investigation as the Project Manager and Contractor will perform an inspection of work to identify obvious defects or deficiencies. Contractor to correct work accordingly.

.3 Completion: submit written certificate that following have been performed:
- .1 Work has been completed and inspected for compliance with Contract Documents.
- .2 Defects have been corrected and deficiencies have been completed.
- .3 Equipment and systems have been tested, adjusted and balanced and are fully operational.
- .4 Operation of systems have been demonstrated to Owner's personnel.
- .5 Work is complete and ready for final inspection.

.4 Final Inspection: when items noted above are completed, request final inspection of work by Architect and Contractor. If work is deemed incomplete by Architect, complete outstanding items and request re-inspection.

.5 Declaration of Substantial Performance: when Architect considers deficiencies and defects have been corrected and it appears requirements of Contract have been substantially performed, the Contractor shall make application for Certificate of Substantial Performance.

.6 Commencement of Lien and Warranty Periods: date of Owner's acceptance of submitted declaration of Substantial Performance of the entire work shall be date for commencement for warranty period and commencement of lien period unless required otherwise by lien statute of Place of Work.

.7 Final Payment: when Owner and Architect 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 Architect, complete outstanding items and request re-inspection.

1.2 CLEANING

.1 In accordance with Section 01 74 11 - Cleaning.

.2 Remove waste and surplus materials, rubbish and construction facilities from the site.

END OF SECTION

PART 1 - GENERAL

1.1 SUBMITTALS

.1 Submittals: in accordance with Section 01 33 00 - Submittal Procedures.

.2 Prepare instructions and data using personnel experienced in maintenance and operation of described products.

.3 Copy will be returned after final inspection, with Division Chief – Fire Prevention and Investigation as the Project Manager /Architect comments.

.4 Revise content of documents as required prior to final submittal.

.5 Two weeks prior to Substantial Performance of the Work, submit to Division Chief – Fire Prevention and Investigation as the Project Manager /Architect one electronic copy for review followed by two hard copies required once approved.

.6 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.

.7 Furnish evidence, if requested, for type, source and quality of products provided.

.8 Defective products will be rejected, regardless of previous inspections. Replace products at own expense.

.9 Pay costs of transportation.

1.2 - FORMAT

.1 Organize data based on requirements of City of Saint John.

1.3 - AS-BUILTS AND SAMPLES

.1 Maintain, in addition to requirements in General Conditions, at site for Division Chief – Fire Prevention and Investigation as the Project Manager /Architect one record copy of:
- .1 Contract Drawings.
- .2 Specifications.
- .3 Addenda.
- .4 Change Orders and other modifications to Contract.
- .5 Reviewed shop drawings, product data, and samples.
- .6 Field test records.
- .7 Inspection certificates.
- .8 Manufacturer's certificates.

.2 Store record documents and samples in field office apart from documents used for construction. Provide files, racks, and secure storage.

.3 Label record documents and file in accordance with Section number listings in List of Contents of this Project Manual. Label each document "PROJECT RECORD" in neat, large, printed letters.

.4 Maintain record documents in clean, dry and legible condition. Do not use record documents for construction purposes.

.5 Keep record documents and samples available for inspection by Division Chief – Fire Prevention and Investigation as the Project Manager /Architect.

1.4 - RECORDING ACTUAL SITE CONDITIONS

.1 Record information on set of black line opaque drawings, provided by Division Chief – Fire Prevention and Investigation as the Project Manager.

.2 Provide felt tip marking pens, maintaining separate colours for each major system, for recording information.

.3 Record information concurrently with construction progress.

.4 Contract Drawings and shop drawings: mark each item to record actual construction, including:
- .1 Measured depths of pointing.
- .2 Field changes of dimension and detail.
- .3 Changes made by change orders.
- .4 Details not on original Contract Drawings.
- .5 References to related shop drawings and modifications.

.5 Specifications: 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: qualified laboratory analysis and report, mason certifications, inspection certifications, field test records, and as required by individual specifications sections.

1.5 - MATERIALS AND FINISHES

.1 Building Products, Applied Materials, and Finishes: include product data, with catalogue number, size, composition, and colour and texture designations. Provide information for re-ordering custom manufactured products

.2 Instructions for cleaning agents and methods, precautions against detrimental agents and methods, and recommended schedule for cleaning and maintenance.

.3 Moisture-Protection and Weather-Exposed Products: include manufacturer's recommendations for cleaning agents and methods, precautions against detrimental agents and methods, and recommended schedule for cleaning and maintenance.

.4 Additional Requirements: as specified in individual specifications sections.

1.6 - SPARE PARTS

.1 Provide spare parts/materials, in quantities specified in individual specification sections.

.2 Provide items of same manufacture and quality as items in Work.

.3 Deliver to location as directed by Division Chief – Fire Prevention and Investigation as the Project Manager; place and store.

.4 Receive and catalogue items. Submit inventory listing to Division Chief – Fire Prevention and Investigation as the Project Manager. Include approved listings in Maintenance Manual.

.5 Obtain receipt for delivered products and submit prior to final payment.

1.7 - MAINTENANCE MATERIALS

.1 Provide maintenance and extra materials, in quantities specified in individual specification sections.

.2 Provide items of same manufacture and quality as items in Work.

.3 Deliver to location as directed by Division Chief – Fire Prevention and Investigation as the Project Manager; place and store.

.4 Receive and catalogue items. Submit inventory listing to Division Chief – Fire Prevention and Investigation as the Project Manager. Include approved listings in Maintenance Manual.

.5 Obtain receipt for delivered products and submit prior to final payment.

1.8 - 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 Division Chief – Fire Prevention and Investigation as the Project Manager /Architect.

1.9 - WARRANTIES AND BONDS

.1 Develop warranty management plan to contain information relevant to Warranties.

.2 Submit warranty management plan, 30 days before planned pre-warranty conference, to Division Chief – Fire Prevention and Investigation as the Project Manager approval.

.3 Warranty management plan to include required actions and documents to assure that Owner receives warranties to which it is entitled.

.4 Provide plan in narrative form and contain sufficient detail to make it suitable for use by future maintenance and repair personnel.

.5 Submit, warranty information made available during construction phase, to Division Chief – Fire Prevention and Investigation as the Project Manager for approval prior to each monthly pay estimate.

.6 Assemble approved information in binder and submit upon acceptance of work. Organize binder as follows:

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

.7 Except for items put into use with Owner's permission, leave date of beginning of time of warranty until Date of Substantial Performance is determined.

.8 Conduct joint one year warranty inspection, measured from time of acceptance, by Division Chief – Fire Prevention and Investigation as the Project Manager.

.9 Include information contained in warranty management plan as follows:
- .1 Roles and responsibilities of personnel associated with warranty process, including points of contact and telephone numbers within the organizations of Contractors, subcontractors, manufacturers or suppliers involved.
- .2 Listing and status of delivery of Certificates
- .3 Contractor's plans for attendance at one year post-construction warranty inspections.

.10 Respond in a timely manner to oral or written notification of required construction warranty repair work.

.11 Written verification will follow oral instructions. Failure to respond will be cause for the Division Chief – Fire Prevention and Investigation as the Project Manager to proceed with action against Contractor.

1.10 - PRE-WARRANTY CONFERENCE

.1 Meet with Division Chief – Fire Prevention and Investigation as the Project Manager to develop understanding of requirements of this section. Schedule meeting prior to contract completion, and at time designated by Division Chief – Fire Prevention and Investigation as the Project Manager.

.2 Division Chief – Fire Prevention and Investigation as the Project Manager will establish communication procedures for:
- .1 Notification of construction warranty defects.
- .2 Determine priorities for type of defect.
- .3 Determine reasonable time for response.

.3 Provide name, telephone number and address of licensed and bonded company that is authorized to initiate and pursue construction warranty work action.

.4 Ensure contact is located within local service area of warranted construction, is continuously available, and is responsive to inquiries for warranty work action.

PART 2 - PRODUCTS

2.1 - NOT USED

PART 3 - EXECUTION

3.1 - NOT USED

END OF SECTION

PART 1- GENERAL

1.1 SUMMARY

.1 Section Includes:
  .1 This section is limited to portions of the Building Management Manual (BMM) provided to Architect by Contractor.

.2 Related Sections:
  .1 Section 01 33 00 - Submittal Procedures.
  .2 Section 01 77 00 – Closeout Procedures.

.3 Acronyms:
  .1 BMM - Building Management Manual.
  .2 PI - Product Information.
  .3 PV – Performance Verification.
  .4 WHMIS - Workplace Hazardous Materials Information System.

1.2 GENERAL REQUIREMENTS

.1 Standard letter size paper 216 mm x 279 mm.

.2 Methodology used to facilitate updating.

.3 Drawings, diagrams and schematics to be professionally developed.

.4 Electronic copy of data to be in a format accepted and approved by Architect.

1.3 APPROVALS

.1 Prior to commencement, co-ordinate requirements for preparation, submission and approval with Architect.

1.4 GENERAL INFORMATION

.1 One week prior to Substantial Performance of the Work, submit to Architect, one copy of operating and maintenance manual for review. Modify operating maintenance manuals as required by review.

.2 Operating Maintenance Manuals
  .1 Manuals to contain the following.
    .1 Date submitted.
    .2 Project title, location and project number.
    .3 Table of Contents.
    .4 Guaranties and Warranties.
    .5 Operational information on products. Cleaning and, storing, and similar maintenance information.
    .6 Complete set of reviewed and stamped shop drawings.
    .7 Complete set of project specification.

.3 Bind contents in a three-ring, hard covered, plastic jacketed binder. Organize contents into applicable categories of work, parallel to specifications Sections.

.4 On completion of Work and prior to Interim Inspection for Substantial Completion, submit three (3) copies of modified Operating Maintenance Manuals.

.5 Record Drawings
  .1 After award of Contract, Owner will provide 2 sets of white print drawings for purpose of maintaining record drawings. Using RED INK, accurately and neatly

record deviations from Contract Documents caused by site conditions and changes ordered by Architect.

.2 Record locations of concealed components of this contracts electrical services.

.3 Identify drawings as "Project Record Copy". Maintain in new condition and make available for inspection on site, and at all job meetings, by Architect.

.4 On completion of Work and prior to Interim inspection, submit record documents to Architect for preparation of "AS BUILT" transparencies.

.5 Operating Maintenance manuals need not be submitted prior to the scheduled Interim occupancy inspection of the library addition.

.6 No additional cost is to be applied to the contract relative to the preparation of record drawings and specifications. This service is considered part of the contractor’s overhead.

END OF SECTION

PART 1 - GENERAL

The General Conditions, Supplementary General Conditions and Division 1 shall be read with, and form part of, this section of the Specification.

1.1 DESCRIPTION

.1 Work described includes, but is not necessarily limited to:
- .1 Removal of identified portions of interior walls as scheduled.
- .2 Miscellaneous demolition as necessary to facilitate the completion of architectural, mechanical and electrical improvements.
- .3 Clean up of all demolition products from interior of building.
- .4 Extreme care is to be taken to ensure all adjacent surfaces and materials are not damaged through the work of this contract.
- .5 Any collateral damage to portions of the building to remain shall be restored to as good or better condition by the Contractor and wholly at the Contractor's expense.

1.2 REFERENCE STANDARDS

.1 CSA Group (CSA)
- .1 CSA S350-M1980(R2003), Code of Practice for Safety in Demolition of Structures.

.2 Department of Justice Canada (Jus)
- .1 Canadian Environmental Assessment Act (CEAA), 2012
- .2 Canadian Environmental Protection Act (CEPA), 2012

.3 National Fire Protection Association (NFPA)
- .1 NFPA 241 - 96, Standard for Safeguarding Construction, Alteration, and Demolition Operations

.4 National Research Council Canada (NRC)
- .1 National Building Code of Canada 2015 (NBC).
- .2 National Fire Code of Canada 2015 (NFC).

1.3 EXISTING CONDITIONS

.1 Take over areas to be demolished in their condition on date that Contract is signed, irrespective of their condition at time of examination prior to pricing.

1.4 PROTECTION

.1 Protect parts of existing building to remain. Make good any damage and be liable for injury caused by demolition

.2 Unless otherwise specified, carry out demolition work in accordance with Canadian Construction Code.

.3 Post warning signs on electrical lines and equipment which must remain energized to serve temporary occupancy and other parts of the building during period of demolition.

1.5 JOB CONDITIONS

.1 The existing building, which is the object of selected demolition, will continue to be occupied during all phases of this work. Schedule and perform this work in such a manner as to permit continuous access, egress, and acceptable working conditions for the staff performing work within the areas of the building.

.2 Co-operate with others in the execution of their work regarding existing building, in relocation of services, disconnections, bracing of existing structure, etc.

.3 No site burning will be permitted.

.4 Unless otherwise noted on the drawings or in other sections of the specifications, existing equipment and materials which are part of the work to be demolished and cleared, shall become the property of the Contractor and be legally disposed of off-site. No one not having a contract with the Contractor for part of the work of this contract may demolish or remove anything from the site.

1.6 SAFETY

.1 Provide barriers, warning signs, dust screens, and other forms of protection required by regulations for ensuring the safety of others.

1.7 EXECUTION

.1 Remove existing equipment, services and obstacles where required for refinishing or making good of existing surfaces, and replace same as work progresses.

.2 Where materials or existing surfaces are to be reused, make cuts to and around square, neat and suitable to be worked to or refinished.

1.8 CLEAN-UP

.1 As work progresses, and at completion of work of this section, remove all debris, equipment and materials and leave site ready for work of others.

.2 As work progresses, and at completion of work of this section, repair, replace and clean, as directed, all damaged or dirtied property of others to Architect/Engineers acceptance.

END OF SECTION

1 GENERAL

1.1 RELATED REQUIREMENTS

.1 Section 08 14 16 Flush Wood Doors.

.2 Section 08 71 00 Door Hardware.

.3 Section 08 81 00 Metal Doors and Frames.

.4 Section 09 91 99 Painting for Minor Works.

1.2 REFERENCE STANDARDS

.1 Architectural Woodwork Manufacturers Association of Canada (AWMAC) and Architectural Woodwork Institute (AWI)
- .1 Architectural Woodwork Quality Standards, 1st edition, 2009.

.2 ASTM International
- .1 ASTM A 123/A 123M-09, Standard Specification for Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products.

.3 Canadian General Standards Board (CGSB)
- .1 CAN/CGSB-11.3-M87, Hardboard.

.4 CSA International
- .1 CSA B111-74(R2003), Wire Nails, Spikes and Staples.
- .2 CSA O121-08, Douglas Fir Plywood.
- .3 CSA O141-05(R2009), Softwood Lumber.
- .4 CSA O151-09, Canadian Softwood Plywood.
- .5 CSA O153-M1980(R2008), Poplar Plywood.

.5 National Lumber Grades Authority (NLGA)
- .1 Standard Grading Rules for Canadian Lumber 2010.

.6 Underwriters Laboratories of Canada (ULC)
- .1 CAN/ULC-S104-10, Standard Method for Fire Tests of Door Assemblies.
- .2 CAN/ULC-S105-09, Standard Specification for Fire Door Frames.

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 plywood and include product characteristics, performance criteria, physical size, finish and limitations. (MDF not permitted)

1.4 QUALITY ASSURANCE

.1 Lumber by grade stamp of agency certified by Canadian Lumber Standards Accreditation Board (CLSAB).

.2 Sustainable Standards Certification:
- .1 Certified Wood: submit listing of wood products and materials used in accordance with CAN/CSA-Z809 or FSC or SFI.

.3 Plywood panels to CSA and ANSI standards.

.4 Wood fire rated frames and panels: listed and labelled by an organization accredited by Standards Council of Canada to CAN/ULC-S104 and CAN/ULC-S105.

1.5 DELIVERY, STORAGE AND HANDLING

.1 Deliver, store and handle materials in accordance with Section 01 52 00 Construction Facilities and 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 and in accordance with manufacturer's recommendations in clean, dry, well-ventilated area.
- .2 Store and protect wood products from nicks, scratches, and blemishes.
- .3 Replace defective or damaged materials with new.

.4 Develop Construction Waste Management Plan related to Work of this Section.

2 PRODUCTS

2.1 MATERIALS

.1 Softwood lumber: S4S, moisture content 19% or less in accordance with the following standards:
- .1 CSA O141.
- .2 CAN/CSA-Z809 or FSC or SFI certified.
- .3 NLGA Standard Grading Rules for Canadian Lumber.
- .4 AWMAC custom grade, moisture content as specified.
- .5 Machine stress-rated lumber is acceptable.
- .6 Hardwood lumber: moisture content 17% or less in accordance:
  - .1 National Hardwood Lumber Association (NHLA).
  - .2 AWMAC custom grade, moisture content as specified.
  - .3 CAN/CSA-Z809 or FSC or SFI certified.

2.2 ACCESSORIES

.1 Nails and staples: to CSA B111; galvanized to ASTM A 123/A 123M for exterior work, interior humid areas and for treated lumber; plain finish elsewhere.

.2 Wood screws: stainless steel, type and size to suit application.

.3 Splines: wood.

.4 Adhesive and Sealants: in accordance with Section 07 92 00 - Joint Sealants.

3 EXECUTION

3.1 EXAMINATION

.1 Verification of Conditions: verify conditions of substrates previously installed under other Sections or Contracts are acceptable for wood products installation in accordance with manufacturer's written instructions.
- .1 Visually inspect substrate in presence of Division Chief – Fire Prevention and investigation.
- .2 Inform Division Chief – Fire Prevention and Investigation of unacceptable conditions immediately upon discovery.
- .3 Proceed with installation only after unacceptable conditions have been remedied.

3.2 INSTALLATION

.1 Do finish carpentry to Quality Standards of (AWMAC).
.2 Scribe and cut as required, fit to abutting walls, and surfaces, fit properly into recesses and to accommodate piping, columns, fixtures, outlets, or other projecting, intersecting or penetrating objects.
.3 Form joints to conceal shrinkage.

3.3 CONSTRUCTION

.1 Fastening:
- .1 Position items of finished carpentry work accurately, level, plumb, true and fasten or anchor securely.
- .2 Design and select fasteners to suit size and nature of components being joined. Use proprietary devices as recommended by manufacturer.
- .3 Set finishing nails to receive filler. Where screws are used to secure members, countersink screw in round smooth cut hole and plug with wood plug to match material being secured.
- .4 Replace items of finish carpentry with damage to wood surfaces including hammer and other bruises.

.2 Standing and running trim:
- .1 Butt and cope internal joints of baseboards to make snug, tight, joint. Cut right angle joints of casing and base with mitred joints.
- .2 Fit backs of baseboards and casing snugly to wall surfaces to eliminate cracks at junction of base and casing with walls.
- .3 Make joints in baseboard, where necessary using a 45 degrees scarf type joint.
- .4 Install door and window trim in single lengths without splicing.

.3 Interior and exterior frames:
- .1 Set frames with plumb sides and level heads and sills and secure.
- .2 Install wood extensions to interior of window frames complete to face of interior gypsum board.

.4 Hardware:
- .1 Install as scheduled.

3.4 INSTALLATION OF TRIM

.1 Standing and running trim:
.1 Interior:
- .1 Grade: Custom.
- .2 Solid stock: Pine species.

3.5 INSTALLATION OF FRAMES

.1 Interior frames: wood unless scheduled otherwise
- .1 Grade: Custom.
- .2 Frames to be solid wood Ash, Birch or Maple species.
- .3 Construction:
  - .1 Profile: 33mm Single Rabbeted Frame with19mm cased opening.

3.6 CLEANING

.1 Progress Cleaning: clean in accordance with Section 01 74 11 – Project Closeout - 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 77 00 – Closeout Procedures - Cleaning.

.3 Waste Management: separate waste materials for recycling.
- .1 Remove recycling containers and bins from site and dispose of materials at appropriate facility.

3.7 PROTECTION

.1 Protect installed products and components from damage during construction.

.2 Repair damage to adjacent materials caused by finish carpentry installation.

END OF SECTION

1 GENERAL

1.1 RELATED REQUIREMENTS

.1 Section 09 91 99 Painting for Minor Works.

1.2 REFERENCE STANDARDS

.1 American National Standards Institute (ANSI)
- .1 ANSI/HPVA HP-1-10, Standard for Hardwood and Decorative Plywood.

.2 ASTM International
- .1 ASTM E 1333-10, Standard Test Method for Determining Formaldehyde Concentrations in Air and Emission Rates From Wood Products Using a Large Chamber.
- .2 ASTM D 2832-92(R2011), Standard Guide for Determining Volatile and Nonvolatile Content of Paint and Related Coatings.
- .3 ASTM D 5116-10, Standard Guide For Small-Scale Environmental Chamber Determinations of Organic Emissions From Indoor Materials/Products.

.3 Architectural Woodwork Manufacturers Association of Canada (AWMAC) and Architectural Woodwork Institute (AWI)
- .1 Architectural Woodwork Quality Standards Illustrated, 8th edition, Version 1.0 (2009).

.4 Canadian General Standards Board (CGSB)
- .1 CAN/CGSB-71.20-M88, Adhesive, Contact, Brushable.

.5 CSA International
- .1 CSA B111-74(R2003), Wire Nails, Spikes and Staples.
- .2 CSA O112.10-08, Evaluation of Adhesives for Structural Wood Products (Limited Moisture Exposure).
- .3 CSA O121-08, Douglas Fir Plywood.
- .4 CSA O141-05(R2009), Softwood Lumber.
- .5 CSA O151-09, Canadian Softwood Plywood.
- .6 CSA O153-M1980(R2008), Poplar Plywood.

.6 Health Canada/Workplace Hazardous Materials Information System (WHMIS)
- .1 Material Safety Data Sheets (MSDS).

.7 National Hardwood Lumber Association (NHLA)
- .1 Rules for the Measurement and Inspection of Hardwood and Cypress 2011.

.8 National Lumber Grades Authority (NLGA)
- .1 Standard Grading Rules for Canadian Lumber 2010.

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 architectural woodwork and include product characteristics, performance criteria, physical size, finish and limitations.
- .2 Submit two copies of WHMIS MSDS.

.3 Shop Drawings:
- .1 Submit drawings - Indicate details of construction, profiles, jointing, fastening and other related details.
  - .1 Scales: profiles full size, details half full size.
- .2 Indicate materials, thicknesses, finishes and hardware.
- .3 Indicate locations of service outlets in casework, typical and special installation conditions, and connections, attachments, anchorage and location of exposed fastenings.

1.4 QUALITY ASSURANCE

.1 Lumber by grade stamp of an agency certified by Canadian Lumber Standards Accreditation Board.

.2 Sustainable Standards Certification:
- .1 Certified Wood: submit listing of wood products and materials used in accordance with CAN/CSA-Z809 or FSC or SFI.

.3 Plywood panels to CSA and ANSI standards.

1.5 DELIVERY, STORAGE AND HANDLING

.1 Deliver, store and handle materials in accordance with Section 01 52 00 Construction Facilities and 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.
- .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.

.3 Storage and Handling Requirements:
- .1 Store materials off ground, indoors, in dry location and in accordance with manufacturer's recommendations in clean, dry, well-ventilated area.
- .2 Store and protect architectural woodwork from nicks, scratches, and blemishes.
- .3 Replace defective or damaged materials with new.

2 PRODUCTS

2.1 MATERIALS

.1 Softwood lumber: unless specified otherwise, S4S, moisture content 19 % or less in accordance with following standards:
- .1 CSA O141.
- .2 CAN/CSA-Z809 or FSC or SFI certified.
- .3 NLGA Standard Grading Rules for Canadian Lumber.
- .4 AWMAC custom grade, moisture content as specified.

.2 Machine stress-rated lumber is acceptable for all purposes.

.3 Hardwood lumber: moisture content 10% or less in accordance with following standards:
- .1 National Hardwood Lumber Association (NHLA).
- .2 CAN/CSA-Z809 or FSC or SFI certified.
- .3 AWMAC custom grade, moisture content as specified.

.4 Douglas fir plywood (DFP): to CSA O121, standard construction, CAN/CSA-Z809 or FSC or SFI certified.
.1 Plywood resin to contain no added urea-formaldehyde.

.5 Canadian softwood plywood (CSP): to CSA O151, standard construction, CAN/CSA-Z809 or FSC or SFI certified.
.1 Plywood resin to contain no added urea-formaldehyde.

.6 Hardwood plywood: to ANSI/HPVA HP-1, CAN/CSA-Z809 or FSC or SFI certified.
.1 Plywood resin to contain no added urea-formaldehyde.

.7 Poplar plywood (PP): to CSA O153, standard construction, CAN/CSA-Z809 or FSC or SFI certified.
.1 Plywood resin to contain no added urea-formaldehyde.

.8 Birch plywood: to AWMAC Paint Grade, CAN/CSA-Z809 or FSC or SFI certified.
.1 Plywood resin to contain no added urea-formaldehyde.

.9 Laminated plastic for flatwork: Section 06 47 00 Plastic Laminates.

.10 Nails and staples: to CSA B111.

.11 Wood screws: steel, plain, type and size to suit application.

.12 Splines: wood.

.13 Sealant: in accordance with Section 07 92 00 - Joint Sealants.

.14 Laminated plastic adhesive:
.1 Adhesive: urea resin adhesive to CSA O112.10, contact adhesive to CAN/CGSB-71.20, resorcinol resin adhesive to CSA O112.10, polyvinyl adhesive to CSA O112.10, two component epoxy thermosetting adhesive.
.2 Adhesives: VOC limit 30g/L maximum to SCAQMD Rule 1168 GS-36.
.3 Clear Wood Finishes: VOC limit 350g/L maximum to GS-11 SCAQMD Rule 1113
.4 Paints: VOC limit 50g/L maximum to GS-11 SCAQMD Rule 1113.

2.2 MANUFACTURED UNITS

.1 Casework:
.1 Fabricate caseworks to AWMAC custom quality grade.
.2 Furring, blocking, nailing strips, grounds and rough bucks and sleepers.
.1 S2S is acceptable.
.2 Board sizes: "standard" or better grade.
.3 Dimension sizes: "standard" light framing or better grade.
.4 Urea-formaldehyde free.
.3 Framing birch or maple species, NHLA grade.
.4 Case bodies (ends, divisions and bottoms).
.1 Hardwood plywood:
.1 Thickness: 20mm.
.2 Face veneer: birch or maple species, custom grade, square cut, matching requirement.
.3 Back veneer: matching requirement.
.5 Backs:
.1 Hardwood plywood:
.1 Thickness: 20 mm.
.2 Face veneer: birch or maple species, custom grade, square cut, matching requirement.

.3 Back veneer: birch or maple species, custom grade, square cut, matching requirement.

.6 Shelving:

.1 Hardwood plywood:

.1 Thickness: 20 mm.

.2 Face veneer: birch or maple species, custom grade, square cut, matching requirement.

.3 Back veneer: birch or maple species, custom grade, square cut, matching requirement.

.2 Edge banding: provide 10 mm thick solid matching wood strip on plywood edges 12 mm or thicker, exposed in final assembly. Strips same width as plywood.

.2 Drawers:

.1 Fabricate drawers to AWMAC custom grade supplemented as follows:

.2 Sides and Backs.

.1 Softwood & poplar plywood DFP custom grade, square edge, 12mm thick.

.3 Bottoms:

.1 Softwood & poplar plywood DFP custom grade, square edge, 12mm thick.

.4 Fronts:

.1 Softwood & poplar plywood DFP custom grade, square edge, 20mm thick.

.3 Casework Doors:

.1 Fabricate doors to AWMAC custom grade supplemented as follows:

.2 Solid wood: birch or maple species, custom grade, 20 mm thick.

.2 Acoustic Panel Dividers - Tectum Panel:

.1 Fabricate acoustic panel dividers using 50.8 mm (2”) TECTUM, (cementitious wood fibre) wall panels with let-in birch hardwood surround and birch hardwood brackets as detailed on the drawings and to AWMAC custom quality grade.

.2 TECTUM panel to be square edge with thickness 50.8 mm (2”).

.3 TECTUM colour to be selected by Architect from full manufacturer’s colour range

.4 Birch surround to be full width of TECTUM panel let-in 13 mm with tongue 13 mm. Birch to be rounded at all exposed edges. Birch to be finished minimum three (3) coats of clear urethane over sanded and sealed substrate.

.3 Sneeze Guard:

.1 Provide clear fabricated sneeze guard of acrylic, polycarbonate or similar type material to size and profile shown on the drawings. Sneeze to be complete with integral bracketing system.

2.3 FABRICATION

.1 Set nails and countersink screws apply plain 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 cutouts for plumbing fixtures, inserts, appliances, outlet boxes and 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 Veneer laminated plastic to core material in accordance with adhesive manufacturer's instructions. Ensure core and laminate profiles coincide to provide continuous support and bond over entire surface. Use continuous lengths up to 3000 mm. Keep joints 600 mm from sink cutouts.

.9 Form shaped profiles and bends as indicated, using postforming grade laminate to laminate manufacturer's instructions.

.10 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.

.11 Apply laminate backing sheet to reverse side of core of plastic laminate work.

.12 Apply laminated plastic liner sheet to interior of cabinetry.

.13 Acoustic panel dividers - Tectum Panel to be fabricated off-site under controlled conditions ensuring joinery is neat, trim and in conformance with AWMAC custom quality grade requirements.

2.4 FINISHING

.1 Finish in accordance with Section 06 47 00 Plastic Laminates and Section 09 91 99 – Painting for Minor Works.

3 EXECUTION

3.1 EXAMINATION

.1 Verification of Conditions: verify conditions of substrates previously installed under other Sections or Contracts are acceptable for architectural woodwork installation in accordance with manufacturer's instructions.
  .1 Visually inspect substrate in presence of Division Chief – Fire Prevention and Investigation.
  .2 Inform Division Chief – Fire Prevention and Investigation of unacceptable conditions immediately upon discovery.
  .3 Proceed with installation only after unacceptable conditions have been remedied.

3.2 INSTALLATION

.1 Do architectural woodwork to Quality Standards of AWMAC.
.2 Install prefinished millwork at locations shown on drawings.
  .1 Position accurately, level, plumb straight.

.3 Fasten and anchor millwork securely.
  .1 Supply and install heavy duty fixture attachments for wall mounted cabinets.

.4 Use draw bolts in countertop joints.

.5 Scribe and cut as required to fit abutting walls and to fit properly into recesses and to accommodate piping, columns, fixtures, outlets or other projecting, intersecting or penetrating objects.

.6 At junction of plastic laminate counter back splash and adjacent wall finish, apply small bead of sealant in accordance with Section 07 92 00 - Joint Sealants.

.7 Apply bituminous coating over wood framing members in contact with masonry or cementitious construction.

.8 Fit hardware accurately and securely in accordance with manufacturer's written instructions.

.9 Site apply laminated plastic to units as indicated.
- .1 Adhere laminated plastic over entire surface.
- .2 Make corners with hairline joints.
- .3 Use full sized laminate sheets.
- .4 Make joints only where approved by Division Chief – Fire Prevention and Investigation as Project Manager and Architect.
- .5 Slightly bevel arises.

.10 For site application, offset joints in plastic laminate facing from joints in core.

3.3 CLEANING

.1 Progress Cleaning: clean in accordance with Section 01 74 11 – Contract Closeout - 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 77 00 Contract Closeout - Cleaning.
- .1 Clean millwork and cabinet work, inside cupboards and drawers and outside surfaces.
- .2 Remove excess glue from surfaces.

3.4 PROTECTION

.1 Protect millwork and cabinet work from damage until final inspection.

.2 Protect installed products and components from damage during construction.

.3 Repair damage to adjacent materials caused by architectural woodwork installation.

END OF SECTION

1 GENERAL

1.1 RELATED REQUIREMENTS

.1 Section 06 20 00 – Finish Carpentry.

.2 Section 06 40 00 – Architectural Woodwork

1.2 REFERENCE STANDARDS

.1 Canadian General Standards Board (CGSB)
- .1 CAN/CGSB-71.20-M88, Adhesive, Contact, Brushable.

.2 CSA International
- .1 CSA O112.10-08, Evaluation of Adhesives for Structural Wood Products (Limited Moisture Exposure).
- .2 CSA O153-M1980 (R2008), Poplar Plywood.

.3 National Electrical Manufacturers Association (NEMA)
- .1 ANSI/NEMA LD-3-05, High Pressure Decorative Laminates (HPDL).

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 laminate, adhesive, and core materials and include product characteristics, performance criteria, physical size, finish and limitations.

.3 Samples:
- .1 Submit for review and acceptance of each unit.

1.4 CLOSEOUT SUBMITTALS

.1 Provide maintenance data for laminate work for incorporation into manual specified in Section 01 77 00 – Closeout Procedures.

1.5 QUALITY ASSURANCE

.1 Test Reports: certified test reports showing compliance with specified performance characteristics and physical properties.

1.6 DELIVERY, STORAGE AND HANDLING

.1 Deliver, store and handle materials in accordance with Section 01 52 00 Construction Facilities and Sheds and Section 01 61 00 – Common Product Requirements.

.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 and in accordance with manufacturer's recommendations in clean, dry, well-ventilated area.
- .2 Store and protect laminate, adhesive, and core materials from nicks, scratches, and blemishes.
- .3 Replace defective or damaged materials with new.

.4 Maintain relative humidity between 25 & 60% at 22 deg C during storage and ventilation.

2 PRODUCTS

2.1 MATERIALS

.1 Laminated plastic for flatwork: to NEMA LD3.
- .1 Type: general purpose.
- .2 Grade: HGS.
- .3 To be durable and stain resistant.
- .3 Size: 1.27 mm thick.
- .4 Colour: integral colour throughout.
- .5 Pattern: solid.
- .6 Finish: satin.

.2 Laminated plastic for postforming work: to NEMA LD3.
- .1 Type: postforming.
- .2 Grade: HGP.
- .3 Size: 1.016 mm thick.
- .4 Colour: integral colour throughout.
- .5 Pattern: solid.
- .6 Finish: satin.

.3 Laminated plastic for backing sheet: to NEMA LD3.
- .1 Type: backer.
- .2 Grade: BKH.
- .3 Size: not less than 0.5 mm thick or same thickness as face laminate.
- .4 Colour: white.

.4 Laminated plastic for liner: to NEMA LD3.
- .1 Type: cabinet liner.
- .2 Grade: CLS.
- .3 Size: 0.75 mm thick
- .4 Colour: white.

.5 Plywood core: to CSA O153 solid two sides, Grade Poplar Plywood, 19 mm thick.

.6 Laminated plastic adhesive: urea resin adhesive to CSA O112.10 contact adhesive to CAN/CGSB-71.20 resorcinol resin adhesive to CSA O112.10, polyvinyl adhesive to CSA O112.10, two component epoxy thermosetting adhesive.

.7 Sealer: water resistant sealer or glue acceptable to laminate manufacturer.

.8 Sealants: Silicone based material to CGSB 19-GP-22M.

.9 Draw bolts and splines: as recommended by fabricator.

2.2 FABRICATION

.1 Comply with NEMA LD3, Annex A.

.2 Obtain governing dimensions before fabricating items which are to accommodate or abut appliances, equipment and other materials.

.3 Ensure adjacent parts of continuous laminate work match in colour and pattern.

.4 Veneer laminated plastic to core material in accordance with adhesive manufacturer's instructions. Ensure core and laminate profiles coincide to provide continuous support and bond over entire surface. Use continuous lengths up to 2400 mm. Where applicable, Keep joints 600 mm from sink cutouts.

.5 Form shaped profiles and bends as indicated, using post forming grade laminate to laminate manufacturer's instructions.

.6 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.

.7 Apply laminate backing sheet to reverse side of core of plastic laminate work.

.8 Apply laminated plastic liner sheet to interior of cabinetry.

3 EXECUTION

3.1 EXAMINATION

.1 Verification of Conditions: verify conditions of substrates previously installed under other Sections or Contracts are acceptable for laminate, adhesive, and core materials installation in accordance with manufacturer's written instructions.

- .1 Visually inspect substrate in presence of Division Chief – Fire Prevention and Investigation as Project Manager.
- .2 Inform Division Chief – Fire Prevention and Investigation of unacceptable conditions immediately upon discovery.
- .3 Proceed with installation only after unacceptable conditions have been remedied.

3.2 MANUFACTURER'S INSTRUCTIONS

.1 Compliance: comply with manufacturer's written recommendations, including product technical bulletins, product catalogue installation instructions, product carton installation instructions, and data sheets.

3.3 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 on centre, 75 mm 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 Site apply laminated plastic to units as indicated. Adhere laminated plastic over entire surface. Make corners with hairline joints. Use full sized laminate sheets. Make joints only where approved. Slightly bevel arises.

.7 For site application, offset joints in plastic laminate facing from joints in core.

3.4 CLEANING

.1 Progress Cleaning: clean in accordance with Section 01 74 11 – Project Closeout-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 77 00 – Contract Closeout Procedures - Cleaning.
  .1 Clean to NEMA LD3, Annex B.
  .2 Remove traces of primer, caulking, epoxy and filler materials and clean doors and frames.

.3 Waste Management: separate waste materials for recycling.
  .1 Remove recycling containers and bins from site and dispose of materials at appropriate facility.

3.5 PROTECTION

.1 Cover finished laminated veneered surfaces with heavy kraft paper or put in cartons during shipment.

.2 Protect installed laminated surfaces in accordance with manufacturer's written recommendations.
  .1 Remove protection only immediately before final inspection.

.3 Protect installed products and components from damage during construction.

.4 Repair damage to adjacent materials caused by laminate, adhesive, and core materials installation.

END OF SECTION

PART 1- GENERAL

1.1 RELATED SECTIONS

.1 Section 09 21 99 Partitions for Minor Works.

.2 Section 09 51 99 Acoustic Ceiling for Minor Works

1.2 REFERENCES

.1 American Society for Testing and Materials International (ASTM):
  .1 ASTM C 553-02, Specification for Mineral Fibre Blanket Thermal Insulation for Commercial and industrial applications.

.2 Canadian Standards Association (CSA)/ULC:
  .1 CAN/ULC S702, Thermal Insulation, Mineral, Fibre for Buildings.
  .2 CSA B111-1974 (R2004), Wire Nails, Spikes and Staples.

.3 Canadian General Standards Board (CGSB)CAN/ULC:
  .1 CAN/ULC-S702-97, Standard for Thermal Insulation, Mineral Fibre, for Bldgs.

.4 Health Canada/Workplace Hazardous Materials Information System (WHMIS);
  .1 Material Safety Data Sheets (MSDS).

1.3 SUBMITTALS

.1 Submit manufacturer's printed product literature, specifications and data sheet in accordance with -General Requirements - Submittal Procedures.

.2 Submit copy of WHMIS MSDS - Material Safety Data Sheets in accordance with General Requirements - Submittal Procedures. Indicate VOC's.

.3 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 Convene pre-installation meeting prior to beginning work of this Section and on-site installations.
  .1 Verify project requirements:
    .1 Review installation and substrate conditions.
    .2 Co-ordinate with other building subtrades.

1.5 WASTE MANAGEMENT AND DISPOSAL

.1 Separate waste materials for reuse and recycling in accordance with General Requirements - Construction/Demolition Waste Management And Disposal.

.2 Remove from site and dispose of packaging materials at appropriate recycling facilities.

.3 Collect and separate for disposal: paper, plastic, polystyrene, corrugated cardboard and packaging materials in appropriate on-site bins for recycling in accordance with Waste Management Plan.

PART 2 - PRODUCTS

2.1 SUSTAINABLE REQUIREMENTS

.1 Materials and Products in accordance with - General Requirements – Sustainable Requirements.

.2 Verification requirements in accordance with Sustainable Requirements: Contractor's Verification.

- .1 Materials and resources.
- .2 Storage and collection of recyclables.
- .3 Construction waste management.
- .4 Resource reuse.
- .5 Recycled content.
- .6 Local/regional materials.
- .7 Low-emitting materials.

2.2 INSULATION – for use within walls

.1 Acoustic Batt Insulation/Absorptive Insulation

- .1 Unfaced glass fiber acoustical insulation to ASTM C665, Type 1, thickness as indicated.
  - .1 Flame spread: to ASTM E84
  - .2 Smoke development: 10 to ASTM E84.
  - .3 Sound Transmission Class: STC 49.
  - .4 Dimensional stability: linear shrinkage to less than 0.1%.

2.3 INSULATION – for use above ceilings

.1 Black Acoustic Blanket Insulation/Absorptive Insulation

- .1 Unfaced black acoustic blanket insulation to ASTM C4111, Type III, thickness 51mm. density 32Kg/m3, securement Type A.
  - .1 Flame spread: 25 or less to ASTM E84.
  - .2 Smoke development: 50 to ASTM E84.
  - .3 Sound Transmission Class: STC 49 minimum.
  - .4 Dimensional stability: linear shrinkage to less than 0.1%.

2.4 ACCESSORIES

.1 Insulation clips:

- .1 Impale type, perforated 50 x 50 mm cold rolled carbon steel 0.8 mm thick, adhesive back, spindle of 2.5 mm diameter annealed steel, length to suit insulation, 25 mm diameter washers of self locking type.

.2 Nails: galvanized steel, length to suit insulation plus 25 mm, to CSA B111.

.3 Staples: 12 mm minimum leg.

.4 Tape: as recommended by manufacturer.

PART 3 - EXECUTION

3.1 MANUFACTURER'S INSTRUCTION

.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 INSULATION INSTALLATION

.1 Install insulation to maintain continuity of thermal protection to building elements/spaces.

.2 Install insulation after building substrate materials are dry.

.3 Fit insulation tight around electrical boxes, plumbing and heating pipes, ducts and other protrusions.

.4 Remove boxes, provide backing and fit insulation tight to faces of opening. Limit backing to 200mm as a means of containing depth of insulation top bottom and sides.

.5 Keep insulation minimum 75mm from heat emitting devices such as recessed light fixtures, and minimum 50 mm from CAN/CGA-B149.1 and CAN/CGA-B149.2 type B and L vents.

.6 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.

.7 Offset both vertical and horizontal joints in multiple layer applications.

.8 Do not compress insulation to fit into spaces.

.9 Do not enclose insulation until it has been inspected and approved by Architect.

.10 Ensure insulation batt is fitted into hollow construction of any steel stud units to provide proper wall type conformity.

.11 Provide a continuous 50mm layer of rigid insulation board from eave to footing of exterior of building envelope. Cover layer as detailed on drawings.

- .1 Adhere rigid insulation to concrete surfaces using purpose made adhesives in strict accordance with Manufacturer's instructions.
- .2 Fasten rigid insulation to exterior wall sheathing with purpose made galvanized washers and nails in strict accordance with Manufacturer's instructions.

3.3 CLEANING

.1 Upon completion of installation, remove surplus materials, rubbish, tools and equipment barriers.

END OF SECTION

1 GENERAL

1.01 RELATED REQUIREMENTS

.1 Section 09 51 99 Acoustic Ceiling for Minor Works.

1.02 REFERENCE STANDARDS

.1 ASTM International (ASTM)
- .1 ASTM C 1029-[15]. Standard Specification for Spray-Applied Rigid Cellular Polyurethane Thermal Insulation.

.2 Underwriters Laboratories of Canada (ULC)
- .1 CAN/ULC-S102-[10], Standard Method of Test for Surface Burning Characteristics of Building Materials and Assemblies.
- .2 CAN/ULC-S127-[14]. Standard Corner Wall Method of Test for Flammability Characteristics on Non-Melting Foam Plastic Building Materials.
- .3 CAN/ULC-S705.1-[15], Standard for Thermal Insulation - Spray Applied Rigid Polyurethane Foam, Medium Density, Material Specification. Includes Amendment 1.2.
- .4 CAN/ULC-S705.2-2005-R2016, Standard for Thermal Insulation - Spray Applied Rigid Polyurethane Foam, Medium Density, Application.

1.03 ADMINISTRATIVE REQUIREMENTS

.1 Pre-installation meeting:
- .1 Convene a pre-installation meeting two (2) weeks prior to beginning work of this Section or any on-site preparation or application. Insulation contractor, manufacturer and [Departmental Representative][DCC Representative][Consultant] will review the following:
  - .1 Verify project requirements.
  - .2 Submission of technical literature and Test reports.
  - .3 Review installation and substrate conditions.
  - .4 Co-ordination with other building sub-trades.
  - .5 Review manufacturer's installation instructions.
  - .6 Preparation of Mock-Ups.
  - .7 On-site testing and inspections.

1.04 ACTION AND INFORMATIONAL SUBMITTALS

.1 Provide submittals in accordance with Section 01 33 00 - Submittal Procedures.

.2 Submit manufacturer's printed product literature, specifications and data sheets. Include product characteristics, performance criteria, and limitations.

.3 Submit manufacturer's installation instructions. Include preparation instructions, recommendations for special storage and handling. Include installation sequence and cleaning procedures.

.4 Submit WHMIS Safety Data Sheet (SDS) in accordance with Section [01 47 15 - Sustainable Requirements: Construction] and Section [02 81 00 - Hazardous Materials].

.5 Submit product certificates signed by manufacturer certifying materials comply with specified performance characteristics and criteria and physical requirements.

.6 Submit evaluation report, test reports and listing from an independent recognized evaluation service or testing laboratory, indicating compliance with specifications for specified performance characteristics and physical properties.

.7 Submit test reports verifying compliance with CAN/ULC-S102 for surface burning characteristics.

1.05 QUALITY ASSURANCE

.1 Manufacturer: company with experience in producing material required for this project, with sufficient production capacity to produce and deliver required units without causing delay in work.

.2 Installer: person specializing in sprayed insulation installations [with documented experience]. Approved by manufacturer. Installer to be certified by an ISO 17024 accredited certification organization in accordance with the requirements in CAN/ULC S705.2. Submit copies of licenses to Division Chief – Fire Prevention and Investigation and Architect for each installer.

.3 Construct mock-up in accordance with Section 01 45 00 - Quality Control.
- .1 Construct mock-up 10 m² minimum. Mock-up to include one inside corner and one outside corner and termination details at openings including doors and windows.
- .2 Allow 24 hours for inspection of mock-up Division Chief – Fire Prevention and Investigation and Architect before proceeding with sprayed insulation work.
- .3 When accepted, Mock-up will demonstrate minimum standard for this work.
- .4 Approved Mock-up may be part of finished work.

1.06 HEALTH AND SAFETY

.1 Comply with requirements of Workplace Hazardous Materials Information System regarding use, handling, storage and disposal of insulation materials.

.2 Protect workers in accordance with CAN-ULC-S705.2 and manufacturer's recommendations.

.3 Ensure that workers wear gloves, supplied fresh air system, dust masks, long sleeved clothing, eye protection and protective clothing when applying foam insulation.

.4 Ensure that workers do not eat, drink or smoke while applying foam insulation.

1.07 DELIVERY, STORAGE AND HANDLING

.1 Deliver, store and handle materials in accordance with Section 01 61 00 - Common Product Requirements and with manufacturer's written instructions.

.2 Delivery and Acceptance Requirements:
- .1 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, indoors, and in clean, dry, well-ventilated area.
- .2 Protect insulation materials from exposure to moisture.
- .3 Replace wet or damaged materials with new.

1.08 WASTE MANAGEMENT7

.1 Conduct Waste Management Plan, Waste Reduction Workplan as specified in Sections 01 74 19- Waste Management and Disposal.

.2 Separate and recycle waste packaging materials in accordance with Waste Management Plan and Waste Reduction Plan.

.3 Return all packaging materials for recycling as specified in the Construction Waste Management Plan and Waste Reduction Workplan.

.4 Dispose of waste products at appropriate recycling facilities. Collect and separate paper and plastic material in appropriate on-site storage containers.

.5 Dispose of waste foam daily and decontaminate empty drums in accordance with foam manufacturer's instructions. Divert metal drums to metal recycling facility.

1.09 SITE CONDITIONS

.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 and fall-out.

.5 Apply insulation only when surfaces and ambient temperatures are within manufacturers' prescribed limits.

2 PRODUCTS

2.01 MATERIALS

.1 Insulation: spray applied closed cell, rigid polyurethane foam to CAN/ULC-S705.1 and ASTM C 1029. Type 2, two component, Medium density. Zero ozone depletion blowing agent. Properties as follows:
- .1 Core density: minimum 38.2 kg /m³. (2.4 pounds per cubic foot).
- .2 Compressive strength: minimum 262 kPa. (38 pounds per square inch).
- .3 Tensile strength: 283 kPa. (41 pounds per square inch).
- .4 Open cell content by volume: maximum 2%.
- .5 Water absorption: less than 0.6% by volume.
- .6 Dimensional stability: aged 28 days at 70° C at 97 % RH plus/minus 3%: less than 12.1% by volume.
- .7 Long term thermal resistance: minimum RSI 1 per 25 mm thickness.
- .8 Air permeance at 35 mm thickness: 0.0005 litres per second per m².
- .9 Water vapour permeance at 50 mm thickness: less than 34 ng/Pa x second x m².
- .10 Specific Gravity: denote range.
- .11 Maximum thickness per pass: 50 mm.
- .12 Surface burning characteristics: to CAN/ULC-S102. Smoke developed: 325.
- .13 Surface flame spread rating: to CAN/ULC-S127: 340.
- .14 Fungus Testing: to ASTM C 1338 – no growth.

.2 Primers: in accordance with manufacturer's recommendations for surface conditions.
- .1 Maximum VOC limit 100 g/L.

.3 Intumescent coating for Spray Foam Insulation: providing 20 minute thermal barrier to ULC and CCMC DC315. Properties as follows:
- .1 Finish: Flat.
- .2 Colour: Ice Gray.
- .3 VOC: 18g/L.
- .4 Volume Solids: 67%.

.5 Drying Time: @77degrees 50% RH to touch, 1-2 hours to recoat 2-4 hours.
.6 Type of cure: Coalescence.
.7 Flash Point: None.
.8 Reducer/Cleaner: Water.
.9 Application: Brush, roller, conventional and airless spray.
.10 Performance: 50+ years HOAC tested.
.11 QAI Listed.
.12 Acceptable Product: DC315 Intumescent Coating as manufactured by International Fireproof technology Inc. or approved equal.

2.02 EQUIPMENT

.1 Spray equipment: in accordance with CAN-ULC-S705.2 and the equipment manufacturer's recommendations for specific type of application.

.2 Provide a separate ‘proportioner’ unit for each spray gun.

3 EXECUTION

3.01 MANUFACTURER'S INSTRUCTIONS

.1 Comply with manufacturer's written instructions including data sheets, technical bulletins, catalogue installation instructions and carton installation instructions.

3.02 EXAMINATION

.1 Verify that conditions of existing substrate are acceptable for sprayed insulation application in accordance with manufacturer's written instructions.
.1 Visually inspect substrate in presence of Division Chief – Fire Prevention and Investigation and Architect.
.2 Ensure surfaces are free of grease and other deleterious materials.
.3 Measure moisture content and temperature of substrate and surface suitability in accordance with CAN/ULC S705.2. Measurements below CAN/ULC S705.2 requirements are not acceptable.
.4 Inform Division Chief – Fire Prevention and Investigation and Architect of unacceptable conditions immediately upon discovery.
.5 Proceed with installation only after unacceptable conditions have been remedied and after receipt of written approval to proceed from Division Chief – Fire Prevention and Investigation and Architect.

3.03 PROTECTION OF IN-PLACE CONDITIONS

.1 Mask and cover adjacent areas to protect from over spray.

.2 Ensure any required foam stop or back up material are in place to prevent over spray and achieve complete seal.

.3 Seal off existing ventilation equipment. Install temporary ducting and fans to ensure exhaust fumes. Provide for make-up air.

.4 Erect barriers, isolate area and post warning signs to advise non-protected personnel to avoid the spay area.

3.04 SURFACE PREPARATION

.1 Clean all surfaces free of oil, grease, dust and debris. Ensure surfaces are clean, dry and properly fastened to ensure adhesion of the foam to the substrate.

.2 Ensure that all work by other trades that may penetrates through the insulation is in place and complete.

3.05 APPLICATION

.1 Apply primer to surfaces where recommended by manufacturer. Apply primer in accordance with manufacturer's instructions.

.2 Spray apply insulation to maintain continuity of thermal protection to building elements and spaces.

.3 Spray apply insulation to primed surfaces in accordance with CAN-ULC-S705.2.

.4 Record equipment settings on the Daily Work Record as required by CAN-ULC-S705.2.

.5 Spray apply insulation to final thickness as indicated on drawings. Apply in consecutive passes to thicknesses as recommended by manufacturer. Minimum thickness: 15 mm. Maximum thickness: 50 mm.

.6 Spray insulation to seal perimeter of electrical boxes, pipes, ducts, frames and other objects into or passing through insulation.

.7 Keep insulation away from heat emitting devices such as recessed light fixtures, chimneys and furnace vents. Maintain minimum distances as recommended by manufacturer's instructions.

.8 Finished surface of foam insulation to be free of voids and imbedded foreign objects.

.9 Remove masking materials and over spray from adjacent areas immediately after foam surface has hardened. Ensure cleaning methods do not damage work performed under other sections.

.10 Trim, as required, any excess thickness that would interfere with the application of cladding system by other trades.

.11 Do not enclose insulation until it has been inspected and approved by Division Chief – Fire Prevention and Investigation and Architect.

3.06 TOLERANCES

.1 Maximum variation from indicated thickness: minus 6 mm, plus 10 mm but not universally high or low.

3.07 PROTECTION

.1 Protect installed products and accessories from damage during construction.

.2 Protect the spray foam from ultraviolet in accordance with manufacturer's requirements.

.3 Cover the spray foam with an appropriate thermal barrier, installed in strict conformance with manufacturer’s written instructions.

3.08 CLEANING

.1 Perform daily cleaning in accordance with Section 01 74 00 - Cleaning.
.1 Leave Work area clean at end of each day.

.2 Upon completion of insulation work, remove surplus materials, rubbish, tools and equipment.
.1 Remove insulation material spilled during installation and leave work area clean.

.3 Separate waste materials for reuse and recycling. Remove recycling containers and bins from Site and dispose of materials at appropriate facility.

END OF SECTION

PART 1 - GENERAL

1.1 RELATED SECTIONS

.1 This Section specifies caulking and sealants not specified in other Sections.

1.2 REFERENCES

.1 Canadian General Standards Board (CGSB):
- .1 CAN/CGSB-19.13-87 Sealing Compound, One component, Elastomeric, Chemical Curing.
- .2 CAN/CGSB-19.24-M90 Multi-component, Chemical Curing Sealing Compound.

.2 American Society for Testing and Materials International (ASTM):
- .1 ASTM C1193 - Standard Guide for Use of Joint Sealants.
- .2 ASTM C920 - Elastomeric Joint Sealants.

.3 Health Canada/Workplace Hazardous Materials Information System (WHMIS) Material Safety Data Sheets (MSDS).

1.3 SHOP DRAWINGS

.1 Submit shop drawings in accordance with General Requirements – Submittals.

1.4 DELIVERY, STORAGE, AND HANDLING

.1 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.

.2 Do not use sealants and primers after manufacturer’s stated shelf life.

1.5 ENVIRONMENTAL AND SAFETY REQUIREMENTS

.1 Comply with requirements of Workplace Hazardous Materials Information System (WHMIS) regarding use, handling, storage, and disposal of hazardous materials; and regarding labeling & provision of material safety data sheets 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.

PART 2 - PRODUCTS

2.1 SEALANT MATERIALS

.1 Sealants for exterior joints: one component, silicone based, low-modulus, neutral-cure joint sealant for general above-grade weathersealing.
- .1 Standard of Acceptance: Dow Corning #791 Silicone Waterproofing or appr’d equal.

.2 Colour of sealant: selected by Architect/Division Chief – Fire Prevention and Investigation.

2.2 BACK-UP MATERIALS

.1 Preformed compressible and non-compressible back-up materials:
- .1 Polyethylene, urethane, neoprene or vinyl foam.
- .2 Extruded closed cell foam backer rod, compatible with primers and sealants.
- .3 Oversize 30 to 50%.

.2 High density foam:

.1 Extruded closed cell polyvinyl chloride (PVC), extruded polyethylene, closed cell, shore A hardness 20, tensile strength 140 to 200 kPa, extruded polyolefin foam, 32 kg/cu. Meter density, or neoprene backer, size as recommended by manufacturer.

.3 Bond breaker tape:

.1 Polyethlene bond breaker tape which will not bond to sealant.

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 existing and completed work of other trades from staining or contamination.

3.2 PREPARATION OF JOINT SURFACES

.1 Examine joint sizes and conditions to establish correct depth to width relationship for installation of backup materials and sealant.

.2 Clean bonding joint surfaces of existing caulking material, harmful matter substances including dust, rust, oil grease, and other matter which may impair work.

.3 Prepare surfaces in accordance with manufacturer's directions.

.4 Ensure joint surfaces are dry and frost free.

.5 Do not apply sealants to joint surfaces treated with sealer, curing compound, water repellent or other coatings unless tests have been performed to ensure compatibility of materials. Remove coatings as required.

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 Sealant backing: Install without gaps, twisting, stretching or puncturing backing material.

3.5 MIXING

.1 Mix materials in strict accordance with manufacturer’s instructions.

3.6 APPLICATION

.1 Control Joint:
- .1 Ensure joint is clean and ready for application of joint material.
- .2 Before installation of caulking, supply and install a foam backer bead within full length of each individual joint per installation recommendations.
- .3 Mask edges of joint where irregular surface or sensitive joint border exist to provide neat joint.
- .4 Apply sealant in continuous beads.
- .5 Apply sealant using gun with proper size nozzle.
- .6 Use sufficient pressure to fill voids and joints solid and provide uniform contact to all adjacent surfaces.
- .7 Form surface of sealant with full bead, smooth, free from ridges, wrinkles, sags, air pockets, embedded impurities.
- .8 Tool exposed surfaces before skinning begins to give slightly concave shape.
- .9 Remove excess compound promptly as work progresses and upon completion

.2 Caulking joint:
- .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 and provide uniform contact to all adjacent surfaces.
- .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.

.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.

END OF SECTION

PART 1 - GENERAL

1.1 RELATED SECTIONS

.1 Section 07 92 00 - Joint Sealants

.2 Section 08 14 16 - Flush Wood Doors.

.3 Section 08 71 00 - Door Hardware.

.4 Section 09 21 99 – Partitions for Minor Works.

.5 Section 09 91 99 – Painting for Minor Works.

1.2 REFERENCES

.1 Canadian Standards Association (CSA)/ULC:
- .1 CAN/ULC S702-1997, Thermal Insulation, Mineral Fibre, for Buildings.
- .2 CSA W59-03, Welded Steel Construction (Metal Arc Welding).

.2 Canadian General Standards Board (CGSB):
- .1 CAN/CGSB-1.40-M89, Primer, Structural Steel, Oil Alkyd Type.
- .2 CAN/CGSB-51.20-M87, Thermal Insulation, Polystyrene, Boards and Pipe Covering.
- .3 CGSB 51-GP-21M-78, Thermal Insulation, Urethane and Isocyanurate, Unfaced.

.3 American Society for Testing and Materials (ASTM):
- .1 ASTM A 366-85, Specification for Steel, Carbon, Cold-Rolled Sheet, Commercial Quality.
- .2 ASTM E 2074-00e1, Methods for Fire Tests of Door Assemblies.

.4 Canadian Steel Door and Frame Manufacturers' Association, (CSDFMA):
- .1 CSDFMA, Specifications for Commercial Steel Doors and Frames, 1990.
- .2 CSDFMA, Recommended Selection and Usage Guide for Commercial Steel Doors, 1990.

1.3 ACTION AND INFORMATIONAL SUBMITTALS

.1 Product Data:
- .1 Submit manufacturer's printed product literature, specifications and data sheet in accordance with Section 01 33 00 - Submittals.

.2 Submit two copies of WHMIS MSDA – Material Safety Data Sheets in accordance with Section 01 33 00 – Submittal Procedures. Indicate VOC’s.
- .1 For caulking materials during application and curing.
- .2 For door materials and adhesives.

.3 Submit shop drawings in accordance with Section 01 33 00 –Submittal Procedures.

.4 Provide produce data in accordance with Section 01 33 00 – Submittal Procedures.

1.4 DELIVERY, STORAGE AND HANDLING

.1 Deliver, store and handle materials in accordance with Section 01 61 00 – Common Product Requirements.

PART 2 - PRODUCTS

2.1 MATERIALS

.1 Steel sheet: cold rolled to ASTM A 366-85, Class 1.

.2 Hot dipped galvanized steel sheet: to ASTM A 653M, minimum base steel thickness in accordance with CSDMA Table 1 – Thickness for Component Parts.

.3 Door and frame types and sizes as listed in the Door Schedule on the tender drawings.

2.2 ADHESIVES

.1 Polystyrene and polyurethane cores: heat resistant, epoxy resin based, low viscosity, contact cement.

2.3 PAINT

.1 Field paint doors and frames in accordance with Section 09 21 99 – Painting for Minor Works. Protect weatherstrips from paint. Provide final finish free of scratches or other blemishes.

2.4 PRIMERS

.1 Touch-up prime CAN/CGSB-1.40-M89.

2.5 ACCESSORIES

.1 Door silencers: single stud rubber/neoprene type.

.2 Fabricate glazing stops as formed channel, minimum 16 mm height, accurately fitted, butted at corners and fastened to frame sections with counter-sunk oval head sheet metal screws.

.3 Metallic paste filler: to manufacturer's standard.

.4 Fire labels: metal riveted as required.

.5 Sealant: Section 07 92 00 – Joint Sealants.

2.6 FRAMES FABRICATION GENERAL

.1 Fabricate frames in accordance with CSDFMA specifications.

.2 Fabricate frames to profiles and maximum face sizes as indicated. Materials to be free from defects impairing strength, durability or appearance.

.3 Interior frames: 1.6 mm welded type construction.

.4 Blank, reinforce, drill and tap frames for mortised, templated hardware, and electronic hardware using templates provided by finish hardware supplier. Reinforce frames for surface mounted hardware. Reinforce frames across the head where a closer is to be installed with a continuous 3 mm thick steel plate welded to both sides of frame. Reinforce frames at each hinge and strike plate of sufficient length to be welded at each end of hinge and strike opening. Reinforce heads of frames wider than 1,200 mm.

.5 Protect mortised cutouts with steel guard boxes.

.6 Prepare frame for door silencers, 3 for single door, 2 at head for double door.

.7 Manufacturer's nameplates on frames and screens are not permitted.

.8 Conceal fastenings except where exposed fastenings are indicated.

.9 Provide factory applied touch up primer at areas where zinc coating has been removed during fabrication.

2.7 FRAME ANCHORAGE

.1 Provide appropriate anchorage to floor and wall construction.

.2 Locate each wall anchor immediately above or below each hinge reinforcement on hinge jamb and directly opposite on strike jamb.

.3 Provide 2 anchors for rebate opening heights up to 1520 mm and 1 additional anchor for each additional 760 mm of height or fraction thereof.

.4 Locate anchors for frames in existing openings not more than 150 mm from top and bottom of each jambs and intermediate at 660 mm o.c. maximum.

2.8 FRAMES: WELDED TYPE

.1 Welding in accordance with CSA W59-03.

.2 Accurately mitre or mechanically joint frame product and securely weld on inside of profile.

.3 Cope accurately and securely weld butt joints of mullions, transom bars, centre rails and sills.

.4 Grind welded joints and corners to a flat plane, fill with metallic paste and sand to uniform smooth finish.

.5 Securely attach floor anchors to inside of each jamb profile.

.6 Weld in 2 temporary jamb spreaders per door frame to maintain proper alignment during shipment.

.7 Fabricate frame products for openings as noted on drawings.

PART 3 - EXECUTION

3.1 INSTALLATION GENERAL

.1 Compliance: comply with manufacturer's written recommendations or specifications, including product technical bulletins, handling, storage and installation instructions, and datasheets.

.2 Install labeled steel fire rated doors and frames to NFPA 80 unless specified otherwise.

.3 Install doors and frames to CSDFMA Installation Guide.

3.2 FRAME INSTALLATION

.1 Set frames plumb, square, level and at correct elevation.

.2 Secure anchorages and connections to adjacent construction.

.3 Brace frames rigidly in position while building in. Install temporary horizontal wood spreader at third points of door opening to maintain frame width. Provide vertical support at centre of head for openings over 1200 mm wide. Remove temporary spreaders after frames are built in.

.4 Make allowances for deflection of structure to ensure structural loads are not transmitted to frames.

.5 Caulk perimeter of frames between frame and adjacent material.

.6 Maintain continuity of air barrier and vapour retarder.

3.3 DOOR INSTALLATION (Wood Doors)

.1 Install doors and hardware in accordance with hardware templates and manufacturer's instructions and Section 08 71 00 – Door Hardware.

.2 Provide even margins between doors and jambs and doors and finished floor and threshold as follows;

- .1 Hinge Side; 1.0mm.
- .2 Latch side and head; 1.5mm.
- .3 Finished floor or top of thresholds; 13mm.

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 i.e. tempered glass, for doors as scheduled.

END OF SECTION

1 GENERAL

1.1 RELATED REQUIREMENTS

.1 Section 08 71 00 Door Hardware

.2 Section 09 91 99 Painting for Minor Works

.3 Section 10 14 00 Signage

1.2 REFERENCE STANDARDS

.1 Architectural Woodwork Manufacturers Association of Canada (AWMAC).
- .1 Quality Standards for Architectural Woodwork 1998.

.2 Canadian General Standards Board (CGSB).
- .1 CAN/CGSB-71.19-M88, Adhesive, Contact, Sprayable.
- .2 CAN/CGSB-71.20-M88, Adhesive, Contact, Brushable.

.3 Canadian Standards Association (CSA International).
- .1 CSA A440.2-98, Energy Performance of Windows and Other Fenestration Systems.
- .2 CSA O1150-M1982 (R2001), Hardwood and Decorative Plywood.
- .3 CAN/CSA O132.2 Series-[90(R1998)], Wood Flush Doors.
- .4 CAN/CSA-O132.5-M1992 (R1998)], Stile and Rail Wood Doors.
- .5 CAN/CSA-Z808-96, A Sustainable Forest Management System: Guidance Document.
- .6 CSA Certification Program for Windows and Doors 00.

.4 Environmental Choice Program (ECP).
- .1 CCD-045-92, Sealants and Caulking Compounds.
- .2 CCD-046-92, Adhesives.

1.3 ACTION AND INFORMATIONAL SUBMITTALS

.1 Product Data:
- .1 Submit manufacturer's printed product literature, specifications and data sheet in accordance with Section 01 33 00 - Submittals.
- .2 Submit two copies of WHMIS MSDS - Material Safety Data Sheets in accordance with Section 01 33 00 – Submittal Procedures. Indicate VOC's:
  - .1 For caulking materials during application and curing.
  - .2 For door materials and adhesives.

.2 Shop Drawings:
- .1 Submit shop drawings in accordance with Section 01 33 00 – Submittal Procedures.
- .2 Indicate door types and cutouts for lights and louvres, sizes, core construction, transom panel construction and cutouts.

1.4 SAMPLES

.1 Manufacturer's Instructions:
- .1 Submit manufacturer's installation instructions.

1.5 QUALITY ASSURANCE

.1 Test Reports: certified test reports showing compliance with specified performance characteristics and physical properties.

.2 Certificates: product certificates signed by manufacturer certifying materials comply with specified performance characteristics and criteria and physical requirements.

.3 Pre-installation Meetings: conduct pre-installation meeting to verify project requirements, manufacturer's installation instructions and manufacturer's warranty requirements. Comply with Section 06 20 00 Finish Carpentry.

1.6 DELIVERY, STORAGE, AND HANDLING

.1 Storage and Protection:
- .1 Protect doors from dampness. Arrange for delivery after work causing abnormal humidity has been completed.
- .2 Store doors in well ventilated room, off floor, in accordance with manufacturer's recommendations.
- .3 Protect doors from scratches, handling marks and other damage. Wrap doors.
- .4 Store doors away from direct sunlight.

1.7 WASTE MANAGEMENT AND DISPOSAL

.1 Remove from site and dispose of packaging materials at appropriate recycling facilities.

.2 Do not dispose of unused paint materials into sewer systems, into lakes, streams, onto ground or in locations where it will pose health or environmental hazard.

2 PRODUCTS

2.1 WOOD FLUSH DOORS

.1 Solid core: to CAN/CSA-O132.2.1.
- .1 Construction:
  - .1 Solid wood core: Glued block core with wood edge band.
- .2 Face Panels:
  - .1 Hardwood; veneer grades: Grade I (Premium), birch species.
- .3 Adhesive: Type I (waterproof) for interior doors.
- .4 Provide Fire Rated solid core wood doors as scheduled.

2.2 GLAZING

.1 Glass: Flat Type 2 - tempered.

2.3 FABRICATION

.1 Vertical edge strips to match face veneer.

.2 Prepare doors for louvres and glazing. Provide hardwood birch species to match face veneer, glazing stops with mitred corners.

.3 Bevel vertical edges of single acting doors 3 mm in 50 mm on lock side and 1.5 mm in 50 mm on hinge side.

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 Unwrap and protect doors in accordance with CAN/CSA-O132.2 Series, Appendix A.

.2 Install labelled fire rated doors to NFPA 80.

.3 Install doors and hardware in accordance with manufacturer's printed instructions and CAN/CSA-O132.2 Series, Appendix A.

.4 Adjust hardware for correct function.

.5 Install glazing. i.e., tempered glass for doors as scheduled.

.6 Install louvres as scheduled.

.7 Where applicable, secure transom and side panels by means of concealed fasteners or countersunk screws concealed by means of wood plugs matching panel in grain and colour.

3.3 ADJUSTMENT

.1 Re-adjust doors and hardware just prior to completion of building to function freely and properly.

3.4 CLEANING

.1 Perform cleaning as soon as possible after installation to remove construction and accumulated environmental dirt.

.2 Remove traces of primer, caulking; clean doors and frames.

.3 Clean glass and glazing materials with approved non-abrasive cleaner.

.4 On completion of installation, remove surplus materials, rubbish, tools and equipment barriers.

END OF SECTION

1 GENERAL

1.1 RELATED REQUIREMENTS

.1 Section 06 20 00 Finish Carpentry

.2 Section 08 11 00 Metal Doors and Frames.

.3 Section 08 14 16 Flush Wood Doors.

1.2 REFERENCE STANDARDS

.1 American National Standards Institute (ANSI) / Builders Hardware Manufacturers Association (BHMA)
- .1 ANSI/BHMA A156.1-2000, American National Standard for Butts and Hinges.
- .2 ANSI/BHMA A156.2-2003, Bored and Preassembled Locks and Latches.
- .3 ANSI/BHMA A156.3-2001, Exit Devices.
- .4 ANSI/BHMA A156.4-2000, Door Controls - Closers.
- .5 ANSI/BHMA A156.5-2001, Auxiliary Locks and Associated Products.
- .6 ANSI/BHMA A156.6-2005, Architectural Door Trim.
- .7 ANSI/BHMA A156.12-2005, Interconnected Locks and Latches.
- .8 ANSI/BHMA A156.13-2002, Mortise Locks and Latches Series 1000.
- .9 ANSI/BHMA A156.16-2002, Auxiliary Hardware.
- .10 ANSI/BHMA A156.18-2006, Materials and Finishes.
- .11 ANSI/BHMA A156.20-2006, Strap and Tee Hinges and Hasps.

.2 Canadian Steel Door and Frame Manufacturers' Association (CSDMA)
- .1 CSDMA Recommended Dimensional Standards for Commercial Steel Doors and Frames - 2009.

1.3 ACTION AND INFORMATIONAL SUBMITTALS

.1 Submit in accordance with Section 01 33 00 - Submittals.

.2 Product Data:
- .1 Submit manufacturer's instructions, printed product literature and data sheets for door hardware and include product characteristics, performance criteria, physical size, finish and limitations.

.3 Samples:
- .1 Submit for review and acceptance of each unit.
- .2 Samples will be returned for inclusion into work.
- .3 Identify each sample by label indicating applicable specification paragraph number, brand name and number, finish and hardware package number.
- .4 After approval samples will be returned for incorporation in Work.

.4 Hardware List:
- .1 Submit contract hardware list.
- .2 Indicate specified hardware, including make, model, material, function, size, finish and other pertinent information.

.5 Test Reports: certified test reports showing compliance with specified performance characteristics and physical properties.

.6 Manufacturer's Instructions: submit manufacturer's installation instructions.

1.4 CLOSEOUT SUBMITTALS

.1 Submit in accordance with Section 01 77 00 – Contract Closeout - Submittals.

.2 Operation and Maintenance Data: submit operation and maintenance data for door hardware for incorporation into manual.

1.5 MAINTENANCE MATERIALS SUBMITTALS

.1 Extra Stock Materials:
- .1 Supply maintenance materials in accordance with Section 01 77 00 – Contract Closeout - Submittals.
- .2 Tools:
  - .1 Contractor to turn over to Division Chief – Fire Prevention and Investigation as Project Manager all wrenches for door closers, locksets and fire exit hardware, and any other specialized tools required for installation and/or removal of hardware, as supplied by the manufacturer.

1.6 QUALITY ASSURANCE

.1 Regulatory Requirements:
- .1 Hardware for doors in fire separations and exit doors certified by a Canadian Certification Organization accredited by Standards Council of Canada.

.2 Certificates: product certificates signed by manufacturer certifying materials comply with specified performance characteristics and criteria and physical requirements.

1.7 DELIVERY, STORAGE AND HANDLING

.1 Deliver, store and handle materials in accordance with Section 01 52 00 Construction Facilities and Section 01 61 00 Common Product Requirements and 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 Package items of hardware including fastenings, separately or in like groups of hardware, label each package as to item definition and location.

.4 Storage and Handling Requirements:
- .1 Store materials in accordance with manufacturer's recommendations in clean, dry, well-ventilated area.
- .2 Store and protect door hardware from nicks, scratches, and blemishes.
- .3 Protect prefinished surfaces with wrapping and strippable coating.
- .4 Replace defective or damaged materials with new.

2 PRODUCTS

2.1 HARDWARE ITEMS

.1 Use one manufacturer's products only for similar items.

2.2 DOOR HARDWARE

.1 Locks and latches:
- .1 Bored and preassembled locks and latches: to ANSI/BHMA A156.2, series 2000 preassembled lock, grade 1, designed for function and keyed as stated in Hardware Schedule.
- .2 Interconnected locks and latches: to ANSI/BHMA A156.12,
- .3 Mortise locks and latches: to ANSI/BHMA A156.13, series 1000 mortise lock, grade 1, designed for function and keyed as stated in Hardware Schedule.
- .4 Lever handles: plain design.
- .5 Roses Escutcheons: round.
- .6 Normal strikes: box type, lip projection not beyond jamb.
- .7 Cylinders: key into keying system as directed by Division Chief – Fire Prevention and Investigation as Project Manager.
- .8 Finished to schedule.

.2 Butts and hinges:
- .1 Butts and hinges: to ANSI/BHMA A156.1, designated by letter A and numeral identifiers, followed by size and finish, listed in Hardware Schedule.
- .2 Self-closing hinges and pivots: to ANSI/BHMA A156.17, designated by letter K and numeral identifiers listed in Hardware Schedule, with suffix letter F indicating listed for used on fire doors, finished to schedule.
- .3 Strap and tee hinges and hasps: to ANSI/BHMA A156.20, designated by letter A and numeral identifiers listed in Hardware Schedule, size listed in Hardware Schedule in accordance with ANSI/BHMA A156.20, table I, finished to 602 (cadmium plated).

.3 Exit devices: to ANSI/BHMA A156.3.

.4 Door Closers and Accessories:
- .1 Door controls (closers): to ANSI/BHMA A156.4, designated by letter C and numeral identifiers listed in Hardware Schedule, size in accordance with ANSI/BHMA A156.4, table A1, finished to schedule.

.5 Architectural door trim: to ANSI/BHMA A156.6, designated by letter J and numeral identifiers listed in Hardware Schedule

.6 Auxiliary hardware: to ANSI/BHMA A156.16.

.7 Door bottom seal: heavy duty door seal of extruded aluminum frame and solid closed cell neoprene seal, recessed in door bottom, closed ends, adjustable, automatic retract mechanism when door is open, clear anodized finish.

.8 Thresholds: to suit x mm wide x full width of door opening, extruded aluminum.

2.3 MISCELLANEOUS HARDWARE

.1 Indexed key control system: to ANSI/BHMA A156.5, designated by letter E and numeral identifiers, provide as directed by Division Chief – Fire Prevention and Investigation as Project Manager for inclusion with existing wall mounted system.

2.4 FASTENINGS

.1 Use only fasteners provided by manufacturer. Failure to comply may void warranties and applicable licensed labels.

.2 Supply screws, bolts, expansion shields and other fastening devices required for satisfactory installation and operation of hardware.

.3 Exposed fastening devices to match finish of hardware.

.4 Where pull is scheduled on one side of door and push plate on other side, supply fastening devices, and install so pull can be secured through door from reverse side. Install push plate to cover fasteners.

.5 Use fasteners compatible with material through which they pass.

2.5 KEYING

.1 Doors, padlocks and cabinet locks to be grand master keyed as directed. Prepare detailed keying schedule in conjunction with Division Chief – Fire Prevention and Investigation.

.2 Supply keys in duplicate for every lock in this Contract.

.3 Supply (3) master keys for each master key or grand master key group.

.4 Stamp keying code numbers on keys and cylinders.

.5 Supply construction cores - locks to be removable core.

.6 Project to be provided (8) construction cores, (8) construction keys and (2) control keys at supply of locksets. Supplier to also provide (2) SKD cores with (2) keys each and (1) control key each, to be turned over to owners and installed by owners.

.7 Hand over permanent cores and keys to Division Chief – Fire Prevention and Investigation for GC to install.

3 EXECUTION

3.1 INSTALLATION

.1 Manufacturer's Instructions: comply with manufacturer's written recommendations, including product technical bulletins, product catalogue installation instructions, product carton installation instructions, and data sheets.

.2 Supply metal door and frame manufacturers with complete instructions and templates for preparation of their work to receive hardware.

.3 Supply manufacturers' instructions for proper installation of each hardware component.

.4 Install hardware to standard hardware location dimensions in accordance with CSDFMA Canadian Metric Guide for Steel Doors and Frames (Modular Construction).

.5 Where door stop contacts door pulls, mount stop to strike bottom of pull.

.6 Install key control cabinet.

.7 Use only manufacturer's supplied fasteners.

.1 "quick" type fasteners, unless specifically manufacturer supplied, is unacceptable.

.8 Remove construction cores when directed by Division Chief – Fire Prevention and Investigation.
.1 Install permanent cores and ensure locks operate correctly.

3.2 ADJUSTING

.1 Adjust door hardware, operators, closures and controls for optimum, smooth operating condition, safety and for weather tight closure.

.2 Lubricate hardware, operating equipment and other moving parts.

.3 Adjust door hardware to ensure tight fit at contact points with frames.

3.3 CLEANING

.1 Progress Cleaning: in accordance with Section 01 74 11 – Contract Closeout - Cleaning.
.1 Leave Work area clean at end of each day.
.2 Clean hardware with damp rag and approved non-abrasive cleaner, and polish hardware in accordance with manufacturer's instructions.
.3 Remove protective material from hardware items where present.
.4 Final Cleaning: upon completion remove surplus materials, rubbish, tools and equipment in accordance with Section 01 74 11 – Contract Closeout - cleaning.

3.4 DEMONSTRATION

.1 Keying System Setup and Cabinet:
.1 Set up key control system with file key tags, duplicate key tags, numerical index, alphabetical index and key change index, label shields, control book and key receipt cards.
.2 Place file keys and duplicate keys in key cabinet on their respective hooks.
.3 Lock key cabinet and turn over key to Division Chief – Fire Prevention and Investigation.

.2 Maintenance Staff Briefing:
.1 Brief maintenance staff regarding:
.1 Proper care, cleaning, and general maintenance of hardware.
.2 Description, use, handling, and storage of keys.
.3 Use, application and storage of wrenches for door closers, locksets, etc.

.3 Demonstrate operation, operating components, adjustment features, lubrication.

3.5 PROTECTION

.1 Protect installed products and components from damage during construction.

.2 Repair damage to adjacent materials caused by door hardware installation.

3.6 SCHEDULE

Item #1 **Interior Door D201 (Fire Rated 45 minutes)**

Door to have:

.1	1	ANSI Function F01 – Latch bolt operated by lever from either side at all times. Hardware to match existing standard of manufacture, type and finish.		
.2	3	Hinges 114 x 101	626	ANSI 8112
.3	1	Floor Stop	626	ANSI 156.16
.4	1	Mortised door bottom	689	ANSI 156.222011
.5	1	Door gasket and sweep		
.6	1	Smoke Seal	Black	ANSI 156.222011

Provide signage as per Section 10 14 00 Signage

Item #2 **Interior Doors: D220A, D220B, D222A, D222B**

Each door to have:

.1	1	ANSI Function F04 – Latch bolt operated by lever from either side except when outside lever is made inoperable by mechanical means other than key. When outside lever is locked, latch bolt is retracted by CoSJ FOB type door operating system or by operating inside lever. Coordination of door operating system with Division Chief – Fire Prevention and Investigation as Project Manager is required to ensure complete and effective integration with existing door operating system.		
.2	3	Hinges 114 x 101	626	ANSI 8112
.3	1	Floor Stop	626	ANSI 156.16
.4	1	Mortised door bottom	689	ANSI 156.222011
.5	1	Door gasket and sweep		
.6	1	Smoke Seal	Black	ANSI 156.222011

Provide signage as per Section 10 14 00 Signage

Item #3 **Interior Doors: D207, D222, and D226**

Each door, frame and its existing hardware is be re-used.

Provide signage as per Section 10 14 00 Signage

Item #4 **Interior Doors: Double Doors D226A D226B at Electrical Panel Enclosure**

Each door to have:

.1	1	ANSI Function F18 – Deadbolt operated by lever from outside and made operable by mechanical means, i.e. by CoSJ FOB type door operating system. Coordination of door operating system with Division Chief – Fire Prevention and Investigation as Project Manager is required to ensure complete and effective integration with existing door operating system.		
.2	6	Hinges 114 x 101	626	ANSI 8112
.3	2	Floor Stop	626	ANSI 156.16

Provide signage as per Section 10 14 00 Signage

END OF SECTION

1 GENERAL

1.1 RELATED REQUIREMENTS

.1 Section 02 41 99 Demolition for Minor Works.

1.2 REFERENCE STANDARDS

.1 ASTM International
- .1 ASTM C 1396/C 1396M-09a, Standard Specification for Gypsum Wallboard.
- .2 ASTM C 475/C 475M 02(2007), Standard Specification for Joint Compound and Joint Tape for Finishing Gypsum Board.
- .3 ASTM C 514-04(2009)e1, Standard Specification for Nails for the Application of Gypsum Board.
- .4 ASTM C 645-09a, Standard Specification for Nonstructural Steel Framing Members.
- .5 ASTM C 754-09a, Standard Specification for Installation of Steel Framing Members to Receive Screw-Attached Gypsum Panel Products.
- .6 ASTM C 840-08, Standard Specification for Application and Finishing of Gypsum Board.
- .7 ASTM C 954-10, Standard Specification for Steel Drill Screws for the Application of Gypsum Panel Products or Metal Plaster Bases to Steel Studs from 0.033 in. (0.84 mm) to 0.122 in. (2.84 mm) in Thickness.
- .8 ASTM C 1002-07, Standard Specification for Steel Self-Piercing Tapping Screws for the Application of Gypsum Panel Products or Metal Plaster Bases to Wood Studs or Steel Studs.
- .9 ASTM C 1047-10, Standard Specification for Accessories for Gypsum Wallboard and Gypsum Veneer Base.
- .10 ASTM C 1178/C 1178M-08, Standard Specification for Glass Mat Water-Resistant Gypsum Backing Board.

.2 Underwriters' Laboratories of Canada (ULC)
- .1 CAN/ULC-S102-07, Standard Method of Test for Surface Burning Characteristics of Building Materials and Assemblies.

1.3 ACTION AND INFORMATIONAL SUBMITTALS

.1 Submit in accordance with Section 01 33 00 - Submittals.

.2 Product Data:
- .1 Submit manufacturer's instructions, printed product literature and data sheets for gypsum, framing, sealants 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 01 52 00 Construction Facilities and Section 01 61 00 Common Product Requirements and 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 materials inside, level, under cover. Protect from weather, damage from construction operations and other causes, in accordance with manufacturer's printed instructions.
.3 Handle materials to prevent damage to edges or surfaces. Protect metal accessories and trim from being bent or damaged.
.4 Store and protect partition materials from nicks, scratches, and blemishes.
.5 Replace defective or damaged materials with new.

.4 Develop Construction Waste Management Plan, Waste Reduction Workplan related to Work of this Section.

2 PRODUCTS

2.1 MATERIALS

.1 Performance / Design Criteria:
.1 Partition assembly to be non-combustible construction and as noted fire resistance rated.
.2 Minimum sound transmission class rating of installed panel partition to be STC 30, tested to ASTM E 90.

.2 Non-structural Metal Framing:
.1 Non-load bearing channel stud framing: to ASTM C 645, stud size as indicated on drawings, roll formed from 0.53 mm thickness hot dipped galvanized steel sheet, for screw attachment of gypsum board. Knock-out service holes at 460 mm centres.
.2 Floor and ceiling tracks: to ASTM C 645 , in widths to suit stud sizes, 32 mm flange height.

2.2 FRAMING AND STRUCTURAL MATERIALS

.1 Lumber: unless specified otherwise, softwood, No. 1 structural grade S-P-F, S4S, moisture content 19% or less at time of installing in accordance with following standards:
.1 CAN/CSA-O141.
.2 NLGA Standard Grading Rules for Canadian Lumber.

.2 Acceptable lumber grading stamps (moisture): S-Dry, KD, MC-15; green lumber not acceptable.
.1 If in the opinion of the Architect the wood material being installed is in excess of 19% moisture content, random moisture testing under the direction of the Architect will be conducted. Contractor to pay for such testing. Provide kiln-dried wood blockings at structural transfer points within floor assemblies.

.3 Glued end-jointed finger-jointed lumber is not acceptable.

.4 Framing and board lumber: in accordance with NBC, except as follows:
.1 Framing and Blocking: Eastern Spruce, NLGA No.1 grade.

.5 Underlayment: ULAY Premium Underlayment:
.1 1220mm x 2440mm and 1220 x 1220mm
.2 8.5mm thickness
.3 50 year limited warranty
.4 to be installed over construction paper

.6 Furring, blocking, nailing strips, grounds, rough bucks, curbs, fascia backing and sleepers:
- .1 S2S is acceptable.
- .2 Board sizes: "Standard" or better grade.
- .3 Dimension sizes: "Standard" light framing or better grade.

.7 Post and timber sizes: Standard or better grade.

.8 Yard Lumber:
- .1 Nailers, Rough bucks, Grounds, Curbs: Species Group D, S-P-F, standard grade.
- .2 Furring and Blocking: Species Group E, Eastern White Pine.

.9 Appearance lumber: Grade A.

2.3 GYPSUM BOARD

.1 Standard board: to ASTM C 1396/C 1396M regular, 12.7 mm thick and Type X, 15.7 mm thick, 1200 mm wide x maximum practical length, ends square cut, edges tapered.

.2 Glass mat water-resistant gypsum backing board: to ASTM C 1178/C 1178M, 15.7mm thick, 1200 mm wide x maximum practical length.

.3 Metal furring runners, hangers, tie wires, inserts, anchors: to ASTM C 1047-10.

.4 Drywall furring channels: 0.5 mm core thickness galvanized steel channels for screw attachment of gypsum board.

.5 Steel drill tapping screws: to ASTM C 1002.

.6 Casing beads, corner beads, control joints and edge trim: to ASTM C 1047, ABS, PVC, Zinc, metal, zinc-coated by hot-dip process, zinc-coated by electrolytic process, aluminum coated or phosphatized, 0.5 mm base thickness, perforated flanges, one piece length per location.

2.4 ACCESSORIES

.1 Acoustical insulation: type recommended by manufacturer to achieve STC rating specified.

.2 Sealants: in accordance with Section 07 92 00 - Joint Sealants to ASTM C 475.
- .1 VOC limit 250 g/L maximum to SCAQMD Rule 1168.

.3 Insulating strip: rubberized, moisture resistant, 3 mm thick closed cell neoprene strip, 12 mm wide, with self sticking permanent adhesive on one face, lengths as required.

3 EXECUTION

3.1 EXAMINATION

.1 Verification of Conditions: verify conditions of substrates previously installed under other Sections or Contracts are acceptable for product installation in accordance with manufacturer's written instructions prior to partition installation.
- .1 Visually inspect substrate in presence of Division Chief – Fire Prevention and Investigation as the Project Manager.
- .2 Inform Division Chief – Fire Prevention and Investigation as the Project Manager and Architect of unacceptable conditions immediately upon discovery.
- .3 Proceed with installation only after unacceptable conditions have been remedied.

3.2 ERECTION OF FRAMING

.1 Install steel framing members to receive screw-attached gypsum board in accordance with ASTM C 754 except where specified otherwise.

.2 Align partition tracks at floor and ceiling and secure at 600 mm on centre maximum.

.3 Place studs vertically at 400 mm on centre and maximum of 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.

.4 Erect metal studding to tolerance of 1:1000.

.5 Co-ordinate simultaneous erection of studs with installation of service lines. When erecting studs ensure web openings are aligned.

.6 Include two studs extending from floor to ceiling at each side of openings wider than stud centres specified. Secure studs together, 50 mm apart using column clips or other approved means of fastening placed alongside frame anchor clips.

.7 Erect track at head of door/window openings and sills of sidelight/window openings to accommodate intermediate studs. Secure track to studs at each end, in accordance with manufacturer's instructions. Install intermediate studs above and below openings in same manner and spacing as wall studs.

.8 Include 40 mm stud or furring channel secured between studs for attachment of fixtures behind lavatory basins, toilet and bathroom accessories, and other fixtures including grab bars and towel rails, attached to steel stud partitions.

.9 Install steel studs or furring channel between studs for attaching electrical & other boxes.

.10 Extend partitions to ceiling height except where indicated.

.11 Maintain clearance under beams and structural slabs to avoid transmission of structural loads to studs. Use double track slip joint.

.12 Install continuous insulating strips to isolate studs from uninsulated surfaces.

.13 Install insulating strip under studs and tracks at perimeter of sound control partitions.

3.3 ERECTION OF GYPSUM BOARD AND ACCESSORIES

.1 Do application and finishing of gypsum board in accordance with ASTM C 840 except where specified otherwise.

.2 Erect hangers and runner channels for suspended gypsum board ceilings in accordance with ASTM C 840 except where specified otherwise.

.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 Frame with furring channels, perimeter of openings for access panels, light fixtures, diffusers, grilles, etc.

.5 Install 19 x 64 mm furring channels parallel to, and at exact locations of steel stud partition header track.

.6 Furr for gypsum board faced vertical bulkheads within and at termination of ceilings.

.7 Furr above suspended ceilings for gypsum board fire and sound stops and to form plenum areas as indicated.

.8 Install wall furring for gypsum board wall finishes in accordance with ASTM C 840, except where specified otherwise.

.9 Install acoustical insulation and sealant in sound rated partitions to correspond with tested assembly.

.10 Install gypsum boards in direction that will minimize number of end-butt joints. Stagger end joints 250 mm minimum.

3.4 APPLICATION

.1 Apply gypsum board after bucks, anchors, blocking, sound attenuation, electrical and mechanical work are approved.

.2 Apply single layer gypsum board to metal furring or framing using screw fasteners. Maximum spacing of screws 300 mm on centre.

.3 Apply water-resistant gypsum board where wall tiles, coating to be applied and adjacent to slop sinks, in janitors closets and in washrooms, shower rooms, etc. 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.

3.5 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 Install insulating strips continuously at edges of gypsum board and casing beads abutting metal window and exterior door frames, to provide thermal break.

.5 Install access doors to electrical and mechanical fixtures specified in respective sections.
  .1 Rigidly secure frames to furring or framing systems.

.6 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.

.7 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.

.8 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.

.9 Completed installation to be smooth, level or plumb, free from waves and other defects and ready for surface finish.

3.6 CLEANING

.1 Progress Cleaning: clean in accordance with Section 01 74 11 – Contract Closeout.
  .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 77 00 – Contract Closeout.

3.7 PROTECTION

.1 Protect installed products and components from damage during construction.

.2 Repair damage to adjacent materials caused by partition installation.

3.8 SCHEDULES

.1 Construct fire rated assemblies where indicated.

END OF SECTION

1 GENERAL

1.1 RELATED REQUIREMENTS

.1 Section 02 21 99 Partitions for Minor Works.

1.2 REFERENCE STANDARDS

.1 ASTM International
- .1 ASTM C635, Standard Specification for Metal Suspension Systems for Acoustical Tile and Lay-In Panel Ceilings.
- .2 ASTM C636/C636M-08, Standard Practice for Installation of Metal Ceiling Suspension Systems for Acoustical Tile and Lay-In Panels.
- .3 ASTM E84: Surface Burning Characteristics Classification.
- .4 ASTM E119: Standard Methods of Fire Tests of Building Construction and Materials.
- .5 ASTM C423: Sound Absorption Coefficients by the Reverberation Room Method.
- .6 ASTM E1414: For CAC Testing.

.2 CISCA Ceiling Installation Handbook.

.3 Canadian General Standards Board (CGSB)
- .1 CAN/CGSB-92.1-M89, Sound Absorptive Prefabricated Acoustical Units.

.4 Underwriter's Laboratories of Canada (ULC)
- .1 CAN/ULC-S102-2007, Standard Method of Test for Surface Burning Characteristics of Building Materials and Assemblies.
- .2 Fire Resistance Directory – Listing and classification.

1.3 ACTION AND INFORMATIONAL SUBMITTALS

.1 Submit in accordance with Section 01 33 00 - Submittals.

.2 Product Data:
- .1 Submit manufacturer's instructions, printed product literature and data sheets for ceiling panels and ceiling suspension system and include product characteristics, performance criteria, physical size, finish and limitations.
- .2 Submit 2 copies of WHMIS MSDS in accordance with provincial requirements.

.3 Shop Drawings:
- .1 Submit drawings stamped and signed by professional engineer registered or licensed in Province of New Brunswick..
- .2 Submit reflected ceiling plans for special grid patterns as indicated.
- .3 Indicate lay-out, insert and hanger spacing and fastening details, splicing method for main and cross runners, change in level details, and acoustical unit support at ceiling fixture, lateral bracing and accessories.

.4 Samples:
- .1 Submit for review and acceptance of each unit.
- .2 Samples will be returned for inclusion into work.
- .3 Submit duplicate full size samples of each type acoustical units.
- .4 Construction Waste Management:
  - .1 Submit project Waste Management Plan Waste Reduction Workplan highlighting recycling and salvage requirements.

1.4 DELIVERY, STORAGE AND HANDLING

.1 Deliver, store and handle materials in accordance with Section 01 52 00 Construction Facilities and Section 01 61 00 Common Product Requirements and with manufacturer's written instructions.

.2 Delivery and Acceptance Requirements: deliver materials to site in original factory packaging, labeled with manufacturer's name and address.

.3 Storage and Handling Requirements:

- .1 Store materials indoors in dry location and in accordance with manufacturer's recommendations in clean, dry, well-ventilated area.
- .2 Store materials inside, level, under cover. Protect from weather, damage from construction operations and other causes, in accordance with manufacturer's printed instructions.
- .3 Handle materials to prevent damage to edges or surfaces. Protect metal accessories and trim from being bent or damaged.
- .4 Store and protect acoustic ceiling materials from nicks, scratches, and blemishes.
- .5 Replace defective or damaged materials with new.

2 PRODUCTS

2.1 COMPONENTS

.1 Acoustic units for suspended ceiling system.

- .1 Mineral Fibre lay-in Acoustic panels
- .2 Non Fire Rated
- .3 Panel Size 610mm x 610mm x 16mm (2’ x 2’ x 5/8”)
- .4 Square edge.
- .5 NRC .55, CAC 35, LR .85).
- .6 CGC – Radar High NRC/CAC #22421 or approved equal.

.2 Acoustical Suspension:

- .1 Hanger Supports and Anchors: as recommended by the ceiling system manufacturer for securement.
- .2 Hanger Wire: minimum 12 ga.
- .3 Interior Grade Suspension Systems 15/16” interlocking tee system consisting of main tees and cross tees for Fire Rated/non Fire Rated tile assemblies.

.3 Performance/Design Criteria:

- .1 Maximum deflection: 1/360th of span to ASTM C 635 deflection test.

2.2 ACCESSORIES

.1 Touch-up paint: in accordance with manufacturer's recommendations for surface.

3 EXECUTION

3.1 EXAMINATION

.1 Verification of Conditions: verify conditions of substrates previously installed under other Sections or Contracts are acceptable for product installation in accordance with manufacturer's written instructions prior to acoustical ceiling installation.
  .1 Visually inspect substrate with Division Chief – Fire Prevention and Investigation.
  .2 Inform Division Chief – Fire Prevention and Investigation and Architect of unacceptable conditions immediately upon discovery.
  .3 Proceed with installation only after unacceptable conditions have been remedied.

3.2 INSTALLATION

.1 Installation: in accordance with ASTM C 636 except where specified otherwise.

.2 Suspension System:
  .1 Erect ceiling suspension system after work above ceiling has been inspected by Division Chief – Fire Prevention and Investigation.
  .2 Secure hangers to overhead structure using attachment methods acceptable to Division Chief – Fire Prevention and investigation and Consultant.
  .3 Install hangers spaced at maximum 1200 mm centres and within 150 mm from ends of main tees.
  .4 Lay out centre line of ceiling both ways, to provide balanced borders at room perimeter with border units not less than 50% of standard unit width with system according to reflected ceiling plan.
  .5 Install wall moulding to provide correct ceiling height.
  .6 Completed suspension system to support super-imposed loads, such as lighting fixtures, diffusers, grilles and speakers.
  .7 Support at light fixtures diffusers with additional ceiling suspension hangers within 150 mm of each corner and at max 600 mm around perimeter of fixture.
  .8 Interlock cross member to main runner to provide rigid assembly.
  .9 Ensure ceiling system is square with adjoining walls and level within 1:1000.

.3 Acoustic Panels:
  .1 Install acoustical panels and tiles in ceiling suspension system.
  .2 Co-ordinate ceiling work with work of other sections such as interior lighting, fire protection communication, and intrusion and detection systems.

3.3 CLEANING

.1 Progress Cleaning: clean in accordance with Section 01 74 11– Contract Closeout.
  .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 77 00 – Contract Closeout.

.3 Waste Management: separate waste materials for recycling

3.4 PROTECTION

.1 Protect installed products and components from damage during construction.

.2 Repair damage to adjacent materials caused by acoustical ceiling installation.

END OF SECTION

1 GENERAL

1.1 RELATED REQUIREMENTS

.1 Section 09 21 99 Partitions for Minor Works.

1.2 REFERENCE STANDARDS

.1 ASTM International
- .1 ASTM F 1303-04(2009), Standard Specification for Sheet Vinyl Floor Covering with Backing.

1.3 ACTION AND INFORMATIONAL SUBMITTALS

.1 Submit in accordance with Section 01 33 00 - Submittals.

.2 Product Data:
- .1 Submit manufacturer's instructions, printed product literature and data sheets for flooring, adhesive, primer, sealer, and include product characteristics, performance criteria, physical size, finish and limitations.
- .2 Submit 2 copies of WHMIS MSDS.

.3 Samples:
- .1 Submit for review and acceptance of each unit.
- .2 Submit duplicate 300 x 300 mm sample pieces of sheet material.

1.4 CLOSEOUT SUBMITTALS

.1 Submit in accordance with Section 01 77 00 Contract Closeout - Submittals.

.2 Operation and Maintenance Data: submit operation and maintenance data for resilient flooring for incorporation into manual.

1.5 DELIVERY, STORAGE AND HANDLING

.1 Deliver, store and handle materials in accordance with Section 01 61 00 Common Product Requirements and 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 indoors in dry location and in accordance with manufacturer's recommendations in clean, dry, well-ventilated area.
- .2 Store and protect resilient flooring from nicks, scratches, and blemishes.
- .3 Replace defective or damaged materials with new.

1.6 SITE CONDITIONS

.1 Ensure high ventilation rate, with maximum outside air, during installation.
- .1 Vent directly to outside.
- .2 Do not let contaminated air recirculate through a district or whole building air distribution system.
- .3 Maintain extra ventilation for 1 month minimum after building occupation.

2 PRODUCTS

2.1 RESILIENT SHEET FLOORING MATERIALS

.1 Sheet flooring: To ASTM F2034 composed of natural ingredients which are mixed and calendered onto a jute backing:
- .1 Thickness: 2.5 mm.
- .2 Width: 2 meters.
- .3 Colour: Allow for four colours with no more than two colours scheduled for each room.
  - .1 Colours selected by Architect from full standard colour range.

.2 Primers and adhesives: of types recommended by resilient flooring manufacturer for specific material on applicable substrate, above, on or below grade.

.3 Sub-floor filler and leveller: as recommended by flooring manufacturer for use with their product.

.4 Sealer and wax: type recommended by resilient flooring material manufacturer for material type and location.

2.2 ACCESSORIES

.1 Resilient base: continuous, top set:
- .1 Type: rubber, 3.0 mm thick.
- .2 Style: straight and cove.
- .3 Height: 101.6 mm.
- .4 Lengths: cut lengths minimum 2400 mm.
- .5 Colour as selected by Division Chief – Fire Prevention and Investigation and Architect from manufacturer's standard colour range.

.2 Primers and adhesives: of types recommended by resilient flooring manufacturer for specific material on applicable substrate, above, on or below grade.

.3 Sub-floor filler and leveler: as recommended by flooring manufacturer for use with their product.

.4 Metal edge strips: extruded aluminum, smooth, mill finish stainless steel with lip to extend under floor finish, shoulder flush with top of adjacent floor finish.

.5 Sealer and wax: type recommended by resilient flooring material manufacturer for material type and location.

3 EXECUTION

3.1 EXAMINATION

.1 Examine conditions, substrates and work to receive work of this Section, co-ordinate with Section 01 61 00 Common Product Requirements.

.2 Verification of Conditions: verify conditions of substrates previously installed under other Sections or Contracts are acceptable for product installation in accordance with manufacturer's written instructions.

- .1 Visually inspect substrate in presence of Division Chief – Fire Prevention and Investigation.
- .2 Inform Division Chief – Fire Prevention and Investigation and Consultant of unacceptable conditions immediately upon discovery.
- .3 Proceed with installation only after unacceptable conditions have been remedied.

.3 Ensure concrete floors are clean and dry by using test methods recommended by flooring manufacturer.

3.2 PREPARATION

.1 Prepare for installation in accordance with manufacturer's written recommendations.

.2 Remove sub-floor ridges and bumps and 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.

- .1 Prohibit traffic until filler is completely cured and dry.

.4 Ensure existing vinyl flooring is removed by trained personnel.

.5 Remove or treat existing adhesives to prevent residual bleeding through to new flooring or interfering with bonding of new adhesives.

.6 Prime Seal concrete slab as recommended by resilient flooring manufacturer's written instructions.

3.3 APPLICATION: FLOORING

.1 Apply adhesive uniformly using recommended trowel. Do not spread more adhesive that can be covered by flooring before initial set takes place.

.2 Resilient sheet flooring:

- .1 Lay flooring with seams parallel to building lines to produce minimum number of seams.
- .2 Border widths: 1/3 minimum width of full material.

.3 Run sheets in direction of traffic. Double cut sheet joints and continuously seal heat weld according to manufacturer's written instructions.

.4 Heat weld seams of linoleum sheet flooring in accordance with manufacturer's written instructions.

.5 As installation progresses, and after installation roll flooring with 45 kg minimum roller to ensure full adhesion. Confirm with manufacturer’s requirements.

.6 Cut flooring neatly around fixed objects.

.7 Continue flooring over areas which will be under built-in furniture.

.8 Continue flooring through areas to receive movable type partitions without interrupting floor pattern.

.9 Terminate resilient flooring at centreline of door in openings where adjacent floor finish or colour is dissimilar.

.10 Install metal edge strips at unprotected or exposed edges where flooring terminates.

3.4 APPLICATION: BASE

.1 Lay out base to keep number of joints at minimum.

.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 Cope internal corners using premoulded corner units for right angle external corners and formed straight base material for external corners of other angles.

.8 Use toeless type base where floor finish will be carpet, coved type elsewhere.

.9 Install toeless type base before installation of carpet on floors.

3.5 CLEANING

.1 Progress Cleaning: clean in accordance with Section 01 74 11 – Contract Closeout.
- .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 77 00 – Contract Closeout.
- .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.

3.6 PROTECTION

.1 Protect installed products and components from damage during construction.

.2 Protect new floors in accordance with manufacturer's printed instructions.

.3 Repair damage to adjacent materials caused by resilient flooring installation.

END OF SECTION

1 GENERAL

1.1 RELATED REQUIREMENTS

.1 Section 08 11 00 Metal Doors and Frames

.2 Section 08 14 16 Flush Wood Doors

.2 Section 09 21 99 Partitions for Minor Works

1.2 REFERENCE STANDARDS

.1 Health Canada/Workplace Hazardous Materials Information System (WHMIS)
- .1 Material Safety Data Sheets (MSDS).

.2 The Master Painters Institute (MPI)
- .1 Architectural Painting Specification Manual - current edition.
- .2 Maintenance Repainting Manual - current edition.

.3 National Research Council Canada (NRC)
- .1 National Building Code of Canada 2015 (NBC).

1.3 ACTION AND INFORMATIONAL SUBMITTALS

.1 Submit in accordance with Section 01 33 00 Submittals Procedures.

.2 Product Data:
- .1 Submit manufacturer's instructions, printed product literature and data sheets for paint and coating products and include product characteristics, performance criteria, physical size, finish and limitations.
- .2 Submit 2 copies of WHMIS MSDS.

.3 Certificates: submit product certificates signed by manufacturer certifying materials comply with specified performance characteristics and criteria and physical requirements.

1.4 DELIVERY, STORAGE AND HANDLING

.1 Deliver, store and handle materials in accordance with Section 01 52 00 Construction Facilities and Section 01 61 00 Common Product Requirements.

.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 Provide and maintain dry, temperature controlled, secure storage.
- .2 Store painting materials and supplies away from heat generating devices.
- .3 Store materials and equipment in well ventilated area within temperature as recommended by manufacturer.

.4 Fire Safety Requirements:
- .1 Supply 1 9 kg Type ABC dry chemical fire extinguisher adjacent to storage area.
- .2 Store oily rags, waste products, empty containers and materials subject to spontaneous combustion in ULC approved, sealed containers and remove from site on a daily basis.
- .3 Handle, store, use and dispose of flammable and combustible materials in accordance with National Fire Code of Canada (NFC) requirements.

1.5 SITE CONDITIONS

.1 Heating, Ventilation and Lighting:
- .1 Ventilate enclosed spaces in accordance with Section 01 51 00 Temporary Utilities.
- .2 Provide minimum lighting level of 323 Lux on surfaces to be painted.

.2 Temperature, Humidity and Substrate Moisture Content Levels:
- .1 Apply paint finishes when ambient air and substrate temperatures at location of installation can be satisfactorily maintained during application and drying process, within MPI and paint manufacturer's prescribed limits.
- .2 Test concrete, masonry and plaster surfaces for alkalinity as required.
- .3 Apply paint to adequately prepared surfaces, when moisture content is below paint manufacturers prescribed limits.

.3 Additional application requirements:
- .1 Apply paint finish in areas where dust is no longer being generated by related construction operations or when wind or ventilation conditions are such that airborne particles will not affect quality of finished surface.

2 PRODUCTS

2.1 MATERIALS

.1 Supply paint materials for paint systems equal to or better than Benjamin Moore - AURA.

.2 Conform to latest MPI requirements for painting work including preparation and priming.

.3 Materials in accordance with MPI - Architectural Painting Specification Manual and MPI - Maintenance Repainting Manual "Approved Product" listing.
- .1 Use MPI listed materials having E2 rating where indoor air quality requirements exist.

.4 Colours: by Architect from full range of manufacturer’s colours. Allow for four (4) colours.

.5 Mixing and tinting:
- .1 Perform colour tinting operations prior to delivery of paint to site, in accordance with manufacturer's written recommendations. Obtain written approval from Division Chief – Fire Prevention and Investigation as Project Manager for tinting of painting materials.
- .2 Use and add thinner in accordance with paint manufacturer's recommendations.
  - .1 Do not use kerosene or similar organic solvents to thin water-based paints.
  - .2 Thin paint for spraying in accordance with paint manufacturer's written recommendations.
  - .3 Re-mix paint in containers prior to and during application to ensure break-up of lumps, complete dispersion of settled pigment, and colour and gloss uniformity.

3 EXECUTION

3.1 GENERAL

.1 Compliance: comply with manufacturer's written recommendations or specifications, including product technical bulletins, handling, storage and installation instructions, and data sheets.

.2 Perform preparation and operations for interior painting in accordance with MPI - Architectural Painting Specifications Manual and MPI - Maintenance Repainting Manual except where specified otherwise.

3.2 EXAMINATION

.1 Investigate existing substrates for problems related to proper and complete preparation of surfaces to be painted. Report to Division Chief – Fire Prevention and Investigation and Architect for damages, defects, unsatisfactory or unfavourable conditions before proceeding with work.

.2 Conduct moisture testing of surfaces to be painted using properly calibrated electronic moisture meter, except test concrete floors for moisture using simple "cover patch test". Do not proceed with work until conditions fall within acceptable range as recommended by manufacturer.

3.3 PREPARATION

.1 Protection of in-place conditions:
- .1 Protect existing building surfaces and adjacent structures from paint spatters, markings and other damage by suitable non-staining covers or masking. If damaged, clean and restore surfaces as directed by Division Chief – Fire Prevention and Investigation.
- .2 Protect items that are permanently attached such as Fire Labels on doors and frames.
- .3 Protect factory finished products and equipment.

.2 Surface Preparation:
- .1 Remove electrical cover plates, light fixtures, surface hardware on doors, bath accessories and other surface mounted equipment, fittings and fastenings prior to undertaking painting operations. Identify and store items in secure location and re-installed after painting is completed.
- .2 Move and cover furniture and portable equipment as necessary to carry out painting operations. Replace as painting operations progress.
- .3 Place "WET PAINT" signs in occupied areas as painting operations progress. Signs to approval of Division Chief – Fire Prevention and Investigation.
- .4 Clean and prepare surfaces in accordance with MPI - Architectural Painting Specification Manual and MPI - Maintenance Repainting Manual specific requirements and coating manufacturer's recommendations.
- .5 Prevent contamination of cleaned surfaces by salts, acids, alkalis, other corrosive chemicals, grease, oil and solvents before prime coat is applied and between applications of remaining coats. Apply primer, paint, or pretreatment as soon as possible after cleaning and before deterioration occurs.

.6 Where possible, prime non-exposed surfaces of new wood surfaces before installation. Use same primers as specified for exposed surfaces.
  .1 Apply vinyl sealer to MPI #36 over knots, pitch, sap and resinous areas.
  .2 Apply wood filler to nail holes and cracks.
  .3 Tint filler to match stains for stained woodwork.

.7 Sand and dust between coats as required to provide adequate adhesion for next coat and to remove defects visible from a distance up to 1000 mm.

.8 Clean metal surfaces to be painted by removing rust, loose mill scale, welding slag, dirt, oil, grease and other foreign substances in accordance with MPI requirements.

.9 Touch up of shop primers with primer as specified.

3.4 APPLICATION

.1 Paint only after prepared surfaces have been accepted by Division Chief – Fire Prevention and Investigation.

.2 Use method of application approved by Division Chief – Fire Prevention and Investigation.
  .1 Conform to manufacturer's application recommendations.

.3 Apply coats of paint in continuous film of uniform thickness.
  .1 Repaint thin spots or bare areas before next coat of paint is applied.

.4 Allow surfaces to dry and properly cure after cleaning and between subsequent coats for minimum time period as recommended by manufacturer.

.5 Sand and dust between coats to remove visible defects.

.6 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.

3.5 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 77 00 – Closeout Procedures.

.3 Place paint, stains, primer defined as hazardous or toxic waste, including tubes and containers, in containers or areas designated for hazardous waste.

END OF SECTION

1 GENERAL

1.1 RELATED REQUIREMENTS

.1 Section 08 14 16 Flush Wood Doors

1.2 REFERENCE STANDARDS

.1 Canadian General Standards Board (CGSB)
- .1 CGSB 41-GP-6M-1983, Sheets, Thermosetting Polyester Plastics, Glass Fibre Reinforced.

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 signage and include product characteristics, performance criteria, physical size, finish and limitations.

.3 Shop Drawings:
- .1 Submit catalogue sheets and full size templates.
- .2 Indicate materials, thicknesses, sizes, finishes, colours, construction details, removable and interchangeable components, mounting methods, sign schedule.
- .3 Submit full size templates or drawn-to-scale details for individually fabricated or incised lettering indicating word and letter spacing.

.4 Samples:
- .1 Submit representative sample of each type sign, sign image and mounting method including, but not limited to: graphics, installation method, and wall plates fixed mounting installation method.

1.4 CLOSEOUT SUBMITTALS

.1 Submit in accordance with Section 01 74 11 – Contract Closeout – Submittals.

1.5 QUALITY ASSURANCE

.1 In accordance with Section 01 61 00 – Common Product Requirements.

1.6 DELIVERY, STORAGE AND HANDLING

.1 Deliver, store and handle materials in accordance with Section 01 61 00 Materials and Equipment - Common Product Requirements and manufacturer's written instructions.

.2 Delivery and Acceptance Requirements: deliver materials to site in original factory packaging, labeled with manufacturer's name and address.

.3 Storage and Handling Requirements:
- .1 Store materials in accordance with manufacturer's recommendations in clean, dry, well-ventilated area.
- .2 Store and protect specified materials from nicks, scratches, and blemishes.
- .3 Replace defective or damaged materials with new.

2 PRODUCTS

2.1 MATERIALS

.1 Engraving sheet: lamicoid 3.2 mm thick plastic sheet, black core.

.2 Adhesives, paints, sealants and solvents for sheet: type recommended by sheet manufacturer for applicable condition.

2.2 SIGN GRAPHICS

.1 Sign graphics: well defined, arranged for balanced appearance, and properly word and letter spaced.

.2 Silk screen process: apply 2 multi colour photographic produced silk screen printed images to face side of transparent sign faces; face side of opaque sign faces.

2.3 WALL PLATES

.1 Plastic wall plates:

.1 Fabricate from colour acrylic sheet fibreglass 3.2 mm thick. Sizes to suit information to be provided by Division Chief - Fire Prevention and Investigation to a maximum of 18 characters. Include for wall plates 75mm high x 3.4 mm thick by length to suit for each room. Location - provided by Division Chief – Fire Prevention and Investigation.

.2 Sign graphics: apply by silk screen or approved alternative method.

2.4 NUMBER PLATES

.1 Fabricate number plates for doors of engraving sheet.

.1 Size: +/-50mm x +/- 75mm.

2.5 FABRICATION

.1 Fabricate signs in accordance with details, specifications and shop drawings.

2.6 FINAL ROOM IDENTIFICATION NUMBERS

.1 Division Chief – Fire Prevention and Investigation will provide a final room identification for each room.

3 EXECUTION

3.1 EXAMINATION

.1 Verification of Conditions: verify that conditions of substrate previously installed under other Sections or Contracts are acceptable for signage installation in accordance with manufacturer's written instructions.
  .1 Visually inspect substrate in presence of Division Chief – Fire Prevention and Investigation.
  .2 Inform Division Chief – Fire Prevention and Investigation of unacceptable conditions immediately upon discovery.
  .3 Proceed with installation only after unacceptable conditions have been remedied.

3.2 INSTALLATION

.1 Manufacturer's Instructions: compliance: comply with manufacturer's written recommendations or specifications, including product technical bulletins, handling, storage and installation instructions, and data sheets.
.2 Erect and secure signs plumb and level at elevations as directed by Division Chief – Fire Prevention and Investigation.
.3 Comply with sign manufacturer's installation instructions and approved shop drawings.
.4 Adhesive attachment:
  .1 Use self-stick adhesive foam tape to manufacturer's instructions to fix sign and prevent "rocking".
  .2 Keep tape maximum 1.6 mm from edges.

3.3 CLEANING

.1 Progress Cleaning: clean in accordance with Section 01 74 11 Contract Closeout - 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 Contract Closeout - Cleaning.
  .1 Leave signs clean.

END OF SECTION

1 GENERAL

1.1 RELATED REQUIREMENTS

.1 Section 06 20 00 Finish Carpentry

1.2 REFERENCE STANDARDS

.1 ASTM International
- .1 ASTM A 167-99(2009), Standard Specification for Stainless and Heat-Resisting Chromium-Nickel Steel Plate, Sheet, and Strip.
- .2 ASTM B 456-03, Standard Specification for Electrodeposited Coatings of Copper Plus Nickel Plus Chromium and Nickel Plus Chromium.
- .3 ASTM A 653/A 653M-09, Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process.

.2 Canadian General Standards Board (CGSB)
- .1 CAN/CGSB-12.5, Mirrors, Silvered.

.3 CSA International
- .1 CAN/CSA-B651-04, Accessible Design for the Built Environment.

1.3 ACTION AND INFORMATIONAL SUBMITTALS

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

.2 Product Data:
- .1 Provide manufacturer's printed product literature and data sheets and include product characteristics, performance criteria, physical size, finish and limitations.

.3 Shop Drawings:
- .1 Indicate size and description of components, base material, surface finish inside and out, hardware and locks, attachment devices, description of rough-in-frame, building-in details of anchors for grab bars.

1.4 CLOSEOUT SUBMITTALS

.1 Provide maintenance data for toilet and bath accessories for incorporation into manual specified in Section 01 77 00 – Closeout Procedures.

1.5 MAINTENANCE MATERIAL SUBMITTALS

.1 Tools:
- .1 Provide special tools required for assembly, disassembly or removal for toilet and bath accessories in accordance with requirements specified in Section 01 77 00 – Closeout Procedures.
- .2 Deliver special tools to Division Chief – Prevention and Investigation.

1.6 DELIVERY, STORAGE AND HANDLING

.1 Deliver, store and handle materials in accordance with Section 01 61 00 – Common Product Requirements.

.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, indoors, in dry location and in accordance with manufacturer's recommendations in clean, dry, well-ventilated area.
- .2 Store and protect toilet and bathroom accessories from nicks, scratches, and blemishes.
- .3 Replace defective or damaged materials with new.

2 PRODUCTS

2.1 MATERIALS

.1 Sustainability Characteristics:
- .1 Laminate Adhesives.
  - .1 Urea Formaldehyde Free.

.2 Stainless steel tubing: Type 304, commercial grade, seamless welded, 1.2 mm wall thickness.

.3 Fasteners: concealed screws and bolts hot dip galvanized, exposed fasteners to match face of unit. Expansion shields fibre, lead or rubber as recommended by accessory manufacturer for component and its intended use.

2.2 COMPONENTS

.1 Toilet tissue dispensers: one (1) for each toilet - to be provided by Division Chief – Fire Prevention and Investigation and installed by this Contractor.

.2 Paper towel dispenser one (1) for each washroom - to be provided by Division Chief – Fire Prevention and Investigation and installed by this Contractor.

.3 Waste receptacles: B-2300 Floor Standing Dome Top Waste Receptacle as manufactured by Bobrick or approved equal. Approximately 330mm wide, 1400mm high, 92mm deep.
- .1 Satin finish stainless steel with black steel-domed top. 2 required.
- .2 150mm diameter opening.
- .3 Galvanized steel liner.
- .4 Capacity: 33gal 125L.
- .5 465mm diameter x 815mm high.

.4 Soap dispenser: one (1) to be provided for each sink liquid push-in valve, as recommended by sink manufacturer and c/w self-contained tank, stainless steel piston and valve assembly, tamper proof filler lock, surface mounted, exposed metal components chrome plated.

.5 Hand dryers: QuietDRy Series TrimDry B—7120 as manufactured by Bobrick or approved equal. Units to be ADA Compliant, ULC and CSA approved. 2 required.
- .1 Mounting surface.
- .2 Wall box: 16 gauge steel.
- .3 Cover: Brushed Stainless Steel.
- .4 Motor: universal type, 74.6 kW, 7500 RPM, resilient mounting, sealed, lubricated bearings, fuse protected, 120V, 15 Amp or equivalent.
- .5 Fan: double inlet centrifugal type, dynamically balanced, directly mounted on motor shaft, 56.6 L/s or equivalent.
- .6 Heating element: protected by an automatic, resetting circuit breaker, isolated from nozzle.

.7 Electronic dryer: power controlled by infrared admitting, receiving electronic control device positioned to dryer on when hands are placed under nozzle. Operation to continue for no more than 80 seconds of continued use.

.8 Nozzle: stainless steel, fixed.

.9 Hard wire to closest available circuit.

.6 Mirrors: wall mounted unit with stainless steel frame. One (1) at each sink.

2.3 FABRICATION

.1 Weld and grind joints of fabricated components flush and smooth. Use mechanical fasteners only where approved.

.2 Wherever possible form exposed surfaces from one sheet of stock, free of joints.

.3 Brake form sheet metal work with 1.5 mm radius bends.

.4 Form surfaces flat without distortion. Maintain flat surfaces without scratches or dents.

.5 Back paint components where contact is made with building finishes to prevent electrolysis.

.6 Hot dip galvanize concealed ferrous metal anchors and fastening devices to CAN/CSA-G164.

.7 Shop assemble components and package complete with anchors and fittings.

.8 Deliver inserts and rough-in frames to job site at appropriate time for building-in. Provide templates, details and instructions for building in anchors and inserts.

.9 Provide steel anchor plates and components for installation on studding and building framing.

2.4 FINISHES

.1 Chrome and nickel plating: to ASTM B 456, satin or polished finish.

.2 Manufacturer's or brand names on face of units not acceptable.

3 EXECUTION

3.1 EXAMINATION

.1 Verification of Conditions: verify that conditions of substrates and surfaces to receive toilet and bathroom accessories previously installed under other Sections or Contracts are acceptable for product installation in accordance with manufacturer's instructions prior to toilet and bathroom accessories installation.

.2 Inform Division Chief – Fire Prevention and Investigation of unacceptable conditions immediately upon discovery.

.3 Proceed with installation only after unacceptable conditions have been remedied.

3.2 INSTALLATION

.1 Install and secure accessories rigidly in place as follows:
  .1 Stud walls: install steel back-plate to stud prior to plaster or drywall finish. Provide plate with threaded studs or plugs.

.2 Use tamper proof screws/bolts for fasteners.

.3 Fill units with necessary supplies shortly before final acceptance of renovation.

3.3 ADJUSTING

.1 Adjust toilet and bathroom accessories components and systems for correct function and operation in accordance with manufacturer's written instructions.

.2 Lubricate moving parts to operate smoothly and fit accurately.

3.4 CLEANING

.1 Progress Cleaning: clean in accordance with Section Contract Closeout 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 toilet/ bathroom accessories installation.

3.6 SCHEDULE

.1 Locate accessories where indicated on drawings and as follows. Exact locations determined by Architect.

.2 Toilet tissue dispenser: mounting height CL 800mm mm above finished floor.

.3 Waste receptacles: where indicated.

.4 Soap dispenser: located at wash basin.

.5 Hand dryer: Maximum height of dispenser and operable part from floor 1200 mm. Connect to closest available electrical circuit.

END OF SECTION

Part 1 General

1.1 REFERENCE STANDARDS

.1 ASTM International (ASTM)

- .1 ASTM A126, Standard Specification for Gray Iron Castings for Valves, Flanges and Pipe Fittings.
- .2 ASTM B62, Standard Specification for Composition Bronze or Ounce Metal Castings.

.2 American Water Works Association (AWWA)

- .1 ANSI/AWWA C700, Standard for Cold Water Meters-Displacement Type, Bronze Main Case.
- .2 ANSI/AWWA C701, Standard for Cold Water Meters-Turbine Type for Customer Service.
- .3 ANSI/AWWA C702, Standard for Cold Water Meters-Compound Type.

.3 CSA Group (CSA)

- .1 CSA-B64 Series, Backflow Preventers and Vacuum Breakers.
- .2 CSA B79, Commercial and Residential Drains and Cleanouts.
- .3 CAN/CSA-B356, Water Pressure Reducing Valves for Domestic Water Supply Systems.

.4 Efficiency Valuation Organization (EVO)

- .1 International Performance Measurement and Verification Protocol (IPMVP).

.5 National Research Council Canada (NRC)

- .1 National Plumbing Code of Canada (NPC).

.6 Plumbing and Drainage Institute (PDI)

- .1 PDI-G101, Testing and Rating Procedure for Grease Interceptors with Appendix of Installation and Maintenance.
- .2 PDI-WH201, Water Hammer Arresters Standard.

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 plumbing products and include product characteristics, performance criteria, physical size, finish and limitations.

.3 Shop Drawings:

.1 Indicate on drawings to indicate method of anchorage, dimensions, materials, accessories, construction and assembly details, and finishes.

.4 Certificates: submit certificates signed by manufacturer certifying that materials comply with specified performance characteristics and physical properties.

.5 Instructions: submit manufacturer's installation instructions.

.6 Manufacturers' Field Reports: manufacturers' field reports specified.

1.3 CLOSEOUT SUBMITTALS

.1 Submit in accordance with Section 01 78 00- Closeout Submittals.

.2 Operation and Maintenance Data: submit operation and maintenance data for plumbing specialties and accessories for incorporation into manual.

.1 Description of plumbing specialties and accessories, giving manufacturers name, type, model, year and capacity.

.2 Details of operation, servicing and maintenance.

.3 Recommended spare parts list.

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 indoors and in accordance with manufacturer's recommendations in clean, dry, well-ventilated area.

.2 Store and protect plumbing materials from nicks, scratches, and blemishes.

.3 Replace defective or damaged materials with new.

Part 2 Products

2.1 CLEANOUTS

.1 Cleanout Plugs: heavy cast iron male ferrule with brass screws and threaded brass or bronze plug. Sealing-caulked lead seat or neoprene gasket.

.2 Access Covers:

.1 Wall Access: face or wall type, round stainless steel cover with flush head securing screws, bevelled edge frame complete with anchoring lugs.

.2 Floor Access: cast iron body and frame with adjustable secured nickel bronze top round and:

.1 Plugs: bolted bronze with neoprene gasket.

.2 Cover for Unfinished Concrete Floors: round nickel bronze w/ gasket, vandal-proof screws.

.3 Cover for Tile and Linoleum Floors: polished nickel bronze with recessed cover for linoleum or tile infill, complete with vandal-proof locking screws.

.4 Cover for Carpeted Floors: polished nickel bronze with deep flange cover for carpet infill, complete with carpet retainer vandal-proof locking screws.

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 plumbing specialities and accessories installation in accordance with manufacturer's written instructions.

.1 Visually inspect substrate in presence of owners representative.

.2 Inform consultant of unacceptable conditions immediately upon discovery.

.3 Proceed with installation only after unacceptable conditions have been remedied.

3.2 MANUFACTURER'S INSTRUCTIONS

.1 Compliance: comply with manufacturer's written recommendations or specifications, including product technical bulletins, handling, storage and installation instructions, and data sheet.

3.3 INSTALLATION

.1 Install in accordance with National Plumbing Code of Canada (NPC), and the requirements of the local authority having jurisdiction.

.2 Install in accordance with manufacturer's instructions and as specified.

3.4 CLEANOUTS

.1 Install cleanouts at base of soil and waste stacks, and rainwater leaders, at locations required code, and as indicated.

.2 Bring cleanouts to wall or finished floor unless serviceable from below floor.

.3 Building drain cleanout and stack base cleanouts: line size to maximum NPS 4.

.4 Access doors:

.1 Verify size and location relative to items to be accessed.

.5 Cleanouts:

.1 Verify covers are gas-tight, secure, yet readily removable.

3.5 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 00- Cleaning.

3.6 PROTECTION

.1 Protect installed products and components from damage during construction.

.2 Repair damage to adjacent materials caused by plumbing specialties and accessories installation.

END OF SECTION

Part 1 General

1.1 SUMMARY

.1 Section Includes: Cross-Linked Polyethylene (PEX) and copper tubing and fittings for a potable water distribution system. It is the intent that PEX tubing be used where possible. Copper to be used only when required to suite site conditions.

.1 Provide labour, materials, transportation, equipment and services to install a PEX tubing potable water distribution system where indicated on the Contract Drawing and specified herein.

.2 Related Sections:

.1 Examine all other portions of the subcontract documents for work or other terms and conditions related to the work of this section.

.2 Provide all work hereunder as required for the support and accommodation of related work.

1.2 REFERENCE STANDARDS

.1 American Society of Mechanical Engineers International (ASME)

.1 ANSI/ASME B16.15, Cast Cooper Alloy Threaded Fittings, Classes 125 and 250.

.2 ANSI/ASME B16.18, Cast Copper Alloy Solder Joint Pressure Fittings.

.3 ANSI/ASME B16.22, Wrought Copper and Copper Alloy Solder Joint Pressure Fittings.

.4 ANSI/ASME B16.24, Cast Copper Alloy Pipe Flanges and Flanged Fittings: Class 150, 300, 400, 600, 900, 1500 and 2500.

.5 ASME B16.26, Cast Copper Alloy Fittings for Flared Copper Tubes.

.6 ASME B31.9, Building Services Piping.

.7 ASME B36.19M, Stainless Steel Pipe.

.2 ASTM International (ASTM)

.1 ASTM A182/A 182M, Standard Specification for Forged or Rolled Alloy and Stainless Steel Pipe Flanges, Forged Fittings, and Valves and Parts for High-Temperature Service.

.2 ASTM A269, Standard Specification for Seamless and Welded Austenitic Stainless Steel Tubing for General Service.

.3 ASTM A307, Standard Specification for Carbon Steel Bolts and Studs, 60,000 PSI Tensile Strength.

.4 ASTM A312/A312M, Seamless, Welded, and Heavily Cold Worked Austenitic Stainless Steel Pipes.

.5 ASTM A351/A351M, Castings, Austenitic, for Pressure Containing Parts.

.6 ASTM A403/A403M , Wrought Austenitic Stainless Steel Piping Fittings.

.7 ASTM A536, Standard Specification for Ductile Iron Castings.

.8 ASTM B32, Standard Specification for Solder Metal.

.9 ASTM B42, Seamless Copper Tube, Standard Sizes.

.10 ASTM B88M, Standard Specification for Seamless Copper Water Tube (Metric).

.11 ASTM F876, Standard Specification for Crosslinked Polyethylene (PEX) Tubing.

.12 ASTM F877, Standard Specification for Crosslinked Polyethylene (PEX) Hot and Cold Water Distribution System.

.13 ASTM F1960 Standard Specification for Cold Expansion Fittings with PEX Reinforcing Rings for Use with Cross-Linked Polyethylene (PEX) Tubing.

.3 American National Standards Institute/American Water Works Association (ANSI)/(AWWA)

.1 ANSI/AWWA C111/A21.11, Rubber-Gasket Joints for Ductile-Iron Pressure Pipe and Fittings.

.2 ANSI/AWWA C151/A21.51, Ductile Iron Pipe, Centrifugally Cast, for Water.

.3 AWWA C904, Crosslinked Polyethylene (PEX) Pressure Pipe, ½ In. (12 mm) through 3 In. (76mm), for Water Service.

.4 CSA Group (CSA)

.1 CSA B137.5, Crosslinked Polyethylene (PEX) Tubing Systems for Pressure Applications.

.2 CSA B242, Groove and Shoulder Type Mechanical Pipe Couplings.

.5 Plastic Pipe Institute (PPI):

.1 PPI Technical Report TR-4.

.6 Underwriters Laboratories of Canada (ULC)

.1 CAN/ULC S101, Fire Endurance Tests of Buildings Construction and Materials.

.2 CAN/ULC S102.2, Method of Test for Surface Burning Characteristics of Flooring, Floor Coverings and Miscellaneous Materials and Assemblies.

.3 CAN/ULC S115, Standard Method of Fire Tests of Firestop.

.7 Department of Justice Canada (Jus)

.1 Canadian Environmental Protection Act, 1999, c. 33 (CEPA).

.8 Health Canada/Workplace Hazardous Materials Information System (WHMIS)

.1 Material Safety Data Sheets (MSDS).

.9 Manufacturer's Standardization Society of the Valve and Fittings Industry (MSS).

.1 MSS-SP-67, Butterfly Valves.

.2 MSS-SP-70, Grey Iron Gate Valves, Flanged and Threaded Ends.

.3 MSS-SP-71, Grey Iron Swing Check Valves, Flanged and Threaded Ends.

.4 MSS-SP-80, Bronze Gate, Globe, Angle and Check Valves.

.10 National Research Council (NRC)

.1 National Plumbing Code of Canada (NPC).

.11 Transport Canada (TC)

.1 Transportation of Dangerous Goods Act, 1992, c. 34 (TDGA).

1.3 SYSTEM DESCRIPTION

.1 Performance Requirements: Provide PEX tubing potable water distribution system which has been manufactured, fabricated and installed to comply with Federal, Provincial and Municipal plumbing and building codes and to maintain performance criteria stated by manufacturer without defects, damage or failure.

1.4 ACTION AND INFORMATIONAL SUBMITTALS

.1 Provide submittals in accordance with Section 01 33 00- Submittal Procedures.

.2 Product Data: Submit product data for specified products.

.1 Submit verification of Standard Grade hydrostatic pressure ratings from Plastic Pipe Institute in accordance with TR-4. The following 3 Standard Grade ratings are required: 93 degrees C (200 degrees F) at 551 kPa (80 psi).

.2 Submit Product Submittal sheets for tubing, manifolds, brackets, pre-sleeved tubing, pre-insulated tubing, supports, tubing/fitting connection system, valves and fittings.

.3 Regulatory Listings: Submit applicable UL, ULC, Warnock Hersey, Intertek or QAI and CSA or NSF listings as proof of compliance with Federal, Provincial and Municipal plumbing and building codes.

.1 Submit listings that indicate that the PEX tubing system has been listed to CAN/ULC-S101 when the PEX tubing is incorporated in and traverses a CAN/ULC-S101 floor/ceiling assembly and wall assembly. The listing must be appropriate to assemblies on site.

.2 Submit listings that indicate that the PEX tubing firestop system has been listed to CAN/ULC-S115 where the PEX tubing penetrates a fire separation. The listing must be appropriate to assemblies on site.

.3 Submit listings that indicate that the PEX tubing system has been listed to CAN/ULC-S102.2 for maximum 25 flame spread and maximum 50 smoke developed.

.4 Submit listings that indicate that the PEX tubing system has been listed to CAN/CSA-B137.5.

.4 Quality Assurance Submittals: Submit the following:

.1 Copy of manufacturer’s letter indicating that the installer has been recognized by the manufacturer as a “Trained Installer” trained in the use of its PEX tubing potable water distribution system.

.2 Manufacturer’s Instructions: Manufacturer’s installation instructions.

.3 Installer shall provide in writing to the project owner that the PEX tubing and components furnished under this specification conforms to the material and mechanical requirements specified herein.

.4 Installer shall provide manufacturer's letter that any firestop coming in contact with the PEX tubing is chemically compatible with the PEX tubing.

.5 Submit CSA listing that the PEX tubing, PEX rings and PEX fittings from the same manufacturer have been tested together and certified as a system.

.5 Closeout Submittals: Submit the following:

.1 Warranty: Warranty documents specified herein.

.2 Manufacturer's Field Reports: Manufacturer's field reports specified herein.

.3 Record Documents: Project record documents for installed materials in accordance with Division 1 Closeout Submittals (Project Record Documents) Section.

1.5 QUALITY ASSURANCE

.1 Qualifications:

.1 Installer Qualifications: Installer shall be experienced in performing work of this section and has specialized in installation of work similar to that required for this project.

.2 Installer Qualifications: Installer shall be recognized by the tubing/fitting manufacturer as a "Trained Installer".

.3 Installation Qualifications: Installation must be by skilled tradesmen holding a trade qualification license or apprentices under the supervision of a licensed tradesman.

.2 Regulatory Requirements: PEX tubing and components shall be installed in full compliance with all Federal, Provincial and Municipal codes, standards and requirements. In particular:

.1 CAN/ULC S102.2:

.1 As outlined in CAN/ULC S102 Appendix Section A1.23, Plastic Fittings and Valves, fittings shall be tested and listed by being mounted to plastic pipe in a method that is representative of field installation.

.2 Up to 2" PEX tubing, Plastic fittings and Pex rings shall be listed to a Maximum 25 flame spread / 50 smoke developed with no spacing requirements or,

.3 Up to 3 " PEX tubing, fittings and PEX ring shall be listed to a Maximum 25 flame spread / 50 smoke developed with the rated insulations

.2 CAN/ULC S115:

.1 PEX tubing penetrating a fire separation shall be sealed per CAN/ULC-S115.

.3 CAN/ULC S101:

.1 PEX tubing contained within a fire separation shall be listed per CAN/ULC-S101.

.2 Ice maker & laundry boxes when contained within a fire separation shall be listed as part of the assembly to CAN/ULC S101.

1.6 DELIVERY, STORAGE AND HANDLING

.1 Ordering: Comply with manufacturer's ordering instructions and lead-time requirements to avoid construction delays.

.2 Delivery: Deliver materials to job site in manufacturer's original, unopened, undamaged containers with identification labels intact.

.3 Storage and Protection: Store materials protected from exposure to harmful weather and job site conditions.

.1 Store PEX tubing in original packaging or under cover to avoid dirt or foreign material from being introduced into the tubing.

.2 Do not expose PEX tubing to direct sunlight for more than 30 days. If construction delays are encountered, installer is responsible for providing UV protection to portions of tubing exposed to direct sunlight.

1.7 WARRANTY

.1 .1 Project Warranty: Refer to Conditions of the Contract for project warranty provisions.

.2 .2 PEX Manufacturer's Warranty: Warranty must meet the following conditions:

.1 Tubing and fittings shall carry a twenty-five (25) year non-prorated warranty against failure due to defect in material or workmanship and;

.2 All tubing manufacturer's valves and stops shall carry a one (1) year non-prorated warranty against failure due to defect in material or workmanship, except for commercial ball valves that shall carry a five (5) year non-prorated warranty and;

.3 The assembly of manufacturer's tubing and fittings shall carry a twenty-five (25) year non-prorated warranty on maintaining a leak-proof seal and;

.4 Warranty shall provide for repair or replacement of any tube, fittings or connection, which are proven to be defective and pay for consequential damages and;

.5 Warranty shall be transferable to subsequent owners and;

.6 Effective Warranty: Current manufacturer's warranty at time of installation and;

.7 Warranty Period: Warranty shall commence on Date of Substantial Completion.

Part 2 Products

2.1 PIPING

.1 Domestic hot, cold and recirculation systems, within building.

.1 All PEX tubing, fittings and fitting assembly shall be by one manufacturer.

.2 All PEX tubing, PEX rings and PEX fittings from the same manufacturer have been tested together and certified as a system

.3 Manufacturer: Uponor Ltd. Uponor AQUAPEX Plumbing System or approved equal.

.2 Where necessary copper tube, hard drawn, type L: to ASTM B88M.

2.2 MATERIALS

.1 Tube Materials: Tube shall be cross-linked polyethylene (PEX) manufactured by PEX-a or peroxide method.

.1 PEX tubing shall be ASTM F876 tested and approved for excessive temperature and pressure for 725 hours at 210 degrees F (99 degrees C) @ 150 psi (1035 kPa).

.2 PEX tubing shall be manufactured in accordance with ASTM F876, ASTM F877 and CAN/CSA-B137.5. The tube shall be listed to ASTM by an independent third party agency.

.3 PEX tubing shall be listed to both NSF/ANSI 14 and 61.

.4 PEX tubing shall have Standard Grade hydrostatic design and pressure ratings of 200 F (82 degrees C) at 80 psi (551 kPa), 180 degrees F (82 degrees C) at 100 psi (689 kPA), and 73.4 degrees F (23 degrees C) at 160 psi (1102 kPa). Temperature and pressure ratings shall be issued by the Plastic Pipe Institute (PPI), a division of the Society of the Plastic Industry (SPI).

.5 Minimum bend radius for cold bending of the PEX tubing shall not be less than six (6) times the outside diameter. Bends with a radius less than stated shall require the use of a bend support as supplied by tube manufacturer.

.6 PEX tube dimensions shall be:

.1 13mm (½") nominal inside diameter in accordance with ASTM F876 and ASTM F877 and/or,

.2 19mm (¾") nominal inside diameter in accordance with ASTM F876 and ASTM F877 and/or,

.3 25mm (1") nominal inside diameter in accordance with ASTM F876 and ASTM F877 and/or,

.4 32mm (1 ¼") nominal inside diameter in accordance with ASTM F876 and ASTM F877 and/or,

.5 38mm (1 ½") nominal inside diameter in accordance with ASTM F876 and ASTM F877 and/or,

.6 51mm (2") nominal inside diameter in accordance with ASTM F876 and ASTM F877 and/or,

.7 76mm (3") nominal inside diameter in accordance with ASTM F876 and ASTM F877

.2 Pre-Sleeved Tubing: All PEX tubing that is encased in concrete shall be pre-sleeved in corrugated polyethylene tubing.

.1 Pre-sleeved tubing shall be supplied by the PEX tubing manufacturer.

.3 Pre-Insulated Tubing: All 13mm to 51mm (½" to 2") PEX tubing that is required to be insulated shall be pre-insulated with 13mm (½") PEX-foam insulation. This insulation requirement does not apply to tubing that is required to be insulated to the requirements of ASHRAE 90.1.

.1 Pre-insulated tubing shall be supplied by the PEX tubing manufacturer.

.4 Manifold Materials: Manifolds shall be manufactured of Engineered Polymers (EP). Manifold connections shall be made to the requirements of ASTM F1960.

.1 Manifolds shall be supplied by the PEX tubing manufacturer.

.2 PEX-a cold expansion type manifolds shall be an assembly consisting of insert and PEX-a cold expansion ring.

.3 Manifold Type: Engineered Polymer (EP) manifold.

.5 Multi-Port Tee Materials: Multi-Port Tee's shall be manufactured of Engineered Polymers (EP). Multi-Port Tee connections shall be made to the requirements of ASTM F1960.

.1 Multi-Port Tee's shall be supplied by the PEX tubing manufacturer.

.2 PEX-a cold expansion type manifolds shall be an assembly consisting of insert and PEX-a cold expansion ring.

.3 Multi-Port Tee Type: Engineered Polymer (EP) Multi-Port Tee.

.6 Fitting Materials: Fittings shall be manufactured of Engineered Polymer (EP). Lead free brass materials are allowed only for transition fittings. Fitting connections shall be made to the requirements of ASTM F1960.

.1 Fittings shall be supplied by the PEX tubing manufacturer.

.2 PEX-a cold expansion type fittings shall be an assembly consisting of insert and PEX-a cold expansion ring.

.3 Polymer Fitting Type: Engineered Polymer (EP) fittings.

2.3 ACCESSORIES

.1 Outlet Boxes: Ice Maker and Washing Machine Outlet Boxes shall be supplied by the PEX tubing manufacturer.

.2 Fixture Shut-Off Valves: Fixture Shut-Off valves shall be supplied by the PEX tubing manufacturer.

.3 Tubing Wall Penetration Brackets: Brackets designed for tubing wall membrane penetrations shall be supplied by PEX tubing manufacturer.

.4 Horizontal Pipe Support Channels: All horizontal pipe supports for PEX sizes 1" and greater shall be gauge 23 galvanized steel channels and self-gripping and be supplied by the PEX tubing manufacturer.

2.4 COPPER PIPING SYSTEM (USE ONLY WHERE NECESSARY)

.1 FITTINGS

.1 Bronze pipe flanges and flanged fittings, Class 150: to ANSI/ASME B16.24.

.2 Cast bronze threaded fittings, Class 250 : to ANSI/ASME B16.15.

.3 Cast copper, solder type: to ANSI/ASME B16.18.

.4 Wrought copper and copper alloy, solder type: to ANSI/ASME B16.22.

.5 NPS 2 and larger:

.6 ANSI/ASME B16.18 or ANSI/ASME B16.22 roll grooved to CSA B242.

.7 NPS 1 ½ and smaller:

.1 Wrought copper to ANSI/ASME B16.22; with 301 stainless steel internal components and EPDM seals. Suitable for operating pressure to 1380 kPa.

.2 JOINTS

.1 Rubber gaskets, latex-free 1.6 mm thick: to AWWA C111.

.2 Bolts, nuts, hex head and washers: to ASTM A307, heavy series.

.3 Solder: 95/5.

.4 Teflon tape: for threaded joints.

.5 Grooved couplings: designed with angle bolt pads to provide rigid joint, complete with EPDM gasket.

.6 Dielectric connections between dissimilar metals: dielectric fitting, complete with thermoplastic liner.

Part 3 Execution

3.1 APPLICATION

.1 Manufacturer's Instructions: comply with manufacturer's written recommendations, including product technical bulletins, handling, storage and installation instructions, and datasheets.

3.2 EXAMINATION

.1 Site Verification of Conditions: Verify conditions which have been previously installed under other sections, are acceptable for PEX tubing system installation in accordance with manufacturer’s instructions.

3.3 INSTALLATION

.1 PEX Potable Water Distribution System:

.1 Install PEX tubing in accordance with tubing manufacturer’s recommendations, installation manuals and technical bulletins and as indicated on Contract Drawings.

.2 PEX tubing shall not be exposed to direct sunlight for more than 30 days.

.3 Insulation must cover the PEX tubing when exposed to a direct UV light source such as fluorescent light bulbs or any UV generating device.

.4 Ensure that no glues, solvents, sealants or chemicals come in contact with the tubing without prior permission from the tube manufacturer.

.5 PEX tubing passing through structural concrete slabs shall be pre-sleeved with corrugated polyethylene as supplied by the manufacturer.

.6 PEX tubing passing through metal studs shall be use grommets or sleeves at the penetration.

.7 Protect PEX tubing with sleeves where abrasion may occur.

.8 Use strike protectors where PEX tubing has the potential for being struck with a screw or nail.

.9 Manufacturer’s bend supports shall be used where bends are less than 6 times outside pipe diameter.

.10 All horizontal runs of 1” and greater PEX tubing runs shall be supported by PEX-a galvanized support channels.

.11 All fitting connections to the PEX tubing shall made to the requirements of ASTM F1960.

.12 Multi-Port Tee’s shall be used in-suite wherever possible instead of straight or reducing tee’s to minimize pressure drops in the plumbing distribution system.

.13 A mid-story support shall be installed in all PEX risers.

.14 A riser clamp shall be installed on top of every floor and against every second ceiling for all PEX risers.

.15 Manufacturer’s wall penetration brackets shall be used at all wall membrane penetrations.

.16 Pressurize PEX potable water distribution system with air or potable water in accordance with applicable codes or, in the absence of applicable codes, to a pressure of 173 kPa (25-psi) above normal working pressure of the system provided that the pressure and temperature rating on the tubing us not exceeded.

.17 Comply with safety precautions when pressure testing, including use of compressed air, where applicable. Water shall not be used to pressurize the system if ambient air temperature has the possibility of dropping below 0 degrees C (32 degrees F).

.18 Related Products Installation: Refer to other sections listed in Related Sections paragraph herein for related products installation.

.2 Install in accordance with NPC and local authority having jurisdiction.

.3 Assemble piping using fittings manufactured to ANSI and Standard Council of Canada (SCC) standards.

.4 Install CWS piping below and away from HWS and HWC and other hot piping so as to maintain temperature of cold water as low as possible.

.5 Connect to fixtures and equipment in accordance with manufacturer's written instructions unless otherwise indicated.

.6 Buried tubing:

.1 Lay in well compacted washed sand in accordance with AWWA Class B bedding.

.2 Bend tubing without crimping or constriction. Fittings are not permitted in buried piping.

.7 Valves

.1 Isolate equipment, fixtures and branches with ball valves.

3.4 FLUSHING AND CLEANING

.1 Flush entire system for 8 h. Ensure outlets flushed for 2 hours.

3.5 PRE-START-UP INSPECTIONS

.1 Systems to be complete, prior to flushing, testing and start-up.

.2 Verify that system can be completely drained.

.3 Ensure that air chambers, expansion compensators are installed properly.

3.6 START-UP

.1 Timing: start up after:

.1 Pressure tests have been completed.

.2 Disinfection procedures have been completed.

.3 Certificate of static completion has been issued.

.4 Water treatment systems operational.

.2 Provide continuous supervision during start-up.

.3 Start-up procedures:

.1 Establish circulation and ensure that air is eliminated.

.2 Check pressurization to ensure proper operation and to prevent water hammer, flashing and/or cavitation.

.3 Monitor piping HWS and HWC piping systems for freedom of movement, pipe expansion as designed.

.4 Check control, limit, safety devices for normal and safe operation.

.4 Rectify start-up deficiencies.

3.7 PERFORMANCE VERIFICATION

.1 Scheduling:

.1 Verify system performance after pressure and leakage tests and disinfection are completed, and Certificate of Completion has been issued by authority having jurisdiction.

.2 Procedures:

.1 Verify that flow rate and pressure meet Design Criteria.

.2 Adjust pressure regulating valves while withdrawal is maximum and inlet pressure is minimum.

.3 Verify performance of temperature controls.

.4 Verify compliance with safety and health requirements.

.5 Check for proper operation of water hammer arrestors. Run one outlet for 10 seconds, then shut of water immediately. If water hammer occurs, replace water hammer arrestor or re-charge air chambers. Repeat for outlets and flush valves.

.6 Confirm water quality consistent with supply standards, and ensure no residuals remain as result of flushing or cleaning.

3.8 CLEANING

.1 Cleaning: Remove temporary coverings and protection of adjacent work areas. Repair or replace damaged installed products. Clean installed products in accordance with manufacturer's instructions prior to Owner's acceptance. Remove construction debris from project site and legally dispose of debris.

3.9 PROTECTION

.1 Protection: Protect installed product and finish surfaces from damage during construction.

END OF SECTION

Part 1 General

1.1 REFERENCE STANDARDS

.1 ASTM International (ASTM)

.1 ASTM D2235, Standard Specification for Solvent Cement for Acrylonitrile-Butadiene-Styrene (ABS) Plastic Pipe and Fittings.

.2 ASTM D2564, Standard Specification for Solvent Cements for Poly (Vinyl-Chloride) (PVC) Plastic Piping Systems.

.2 CSA Group (CSA)

.1 CAN/CSA-Series B1800, Thermoplastic Nonpressure Pipe Compendium - B1800 Series.

.3 Green Seal Environmental Standards (GSES)

.1 Standard GS-36, Commercial Adhesives.

.4 Health Canada/Workplace Hazardous Materials Information System (WHMIS)

.1 Material Safety Data Sheets (MSDS).

.5 National Research Council Canada (NRC)

.1 National Plumbing Code of Canada (NPC).

.6 South Coast Air Quality Management District (SCAQMD), California State

.1 SCAQMD Rule 1168, Adhesive and Sealant Applications.

1.2 ACTION AND INFORMATIONAL SUBMITTALS

.1 Provide submittals in accordance with Section 01 33 00- Submittal Procedures.

.2 Product Data:

.1 Provide manufacturer's printed product literature and datasheets for piping and adhesives, and include product characteristics, performance criteria, physical size, finish and limitations.

1.3 DELIVERY, STORAGE AND HANDLING

.1 Deliver materials to site in original factory packaging, labelled with manufacturer's name, address.

.2 Store at temperatures and conditions recommended by manufacturer.

Part 2 Products

2.1 MATERIAL

.1 For DWV piping to:

.1 CAN/CSA B1800.

.2 Standard of Acceptance:

.1 IPEX System 15 or approved alternate, where concealed or below slab.

.2 IPEX System XFR or approved alternate, where not concealed or below slab.

2.2 JOINTS

.1 Solvent weld for PVC: to ASTM D2564.

.2 Solvent weld for ABS: to ASTM D2235.

Part 3 Execution

3.1 APPLICATION

.1 Manufacturer's Instructions: comply with manufacturer's written recommendations, including product technical bulletins, handling, storage and installation instructions, and datasheets.

3.2 INSTALLATION

.1 Install in accordance with most stringent requirements of the local authority having jurisdiction and the National Plumbing Code.

3.3 TESTING

.1 Hydraulically test to verify grades and freedom from obstructions.

3.4 PERFORMANCE VERIFICATION

.1 Cleanouts:

.1 Ensure accessible and that access doors are correctly located.

.2 Open, cover with linseed oil and re-seal.

.3 Verify cleanout rods can probe as far as the next cleanout, at least.

.2 Test to ensure traps are fully and permanently primed.

.3 Affix applicable label (storm, sanitary, vent, pump discharge) c/w directional arrows every floor or 4.5 m (whichever is less).

END OF SECTION

Part 1 General

1.1 REFERENCE STANDARDS

.1 CSA Group (CSA)

.1 CAN/CSA-B45 Series, Plumbing Fixtures, (Consists of B45.0, B45.1, B45.2, B45.3, B45.4, B45.5, B45.6, B45.7, B45.8 and B45.9).

.2 CSA B125.3, Plumbing Fittings.

.3 CSA B651, Accessible Design for the Built Environment.

.2 Green Seal (GS)

.1 GS-36, Adhesives for Commercial Use.

.3 National Research Council Canada (NRC)

.1 National Building Code of Canada (NBC).

.4 South Coast Air Quality Management District (SCAQMD)

.1 SCAQMD Rule 1168- , Adhesive and Sealant Applications.

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 washroom fixtures and include product characteristics, performance criteria, physical size, finish and limitations.

.2 Indicate fixtures and trim:

.1 Dimensions, construction details, roughing-in dimensions.

.2 Factory-set water consumption per flush at recommended pressure.

.3 For water closets, urinals: minimum pressure required for flushing.

1.3 CLOSEOUT SUBMITTALS

.1 Submit in accordance with Section 01 78 00- Closeout Submittals.

.2 Include:

.1 Description of fixtures and trim, giving manufacturer's name, type, model, year, capacity.

.2 Details of operation, servicing, maintenance.

.3 List of recommended spare parts.

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 in clean, dry, well-ventilated area.

.2 Store and protect materials from nicks, scratches, and blemishes.

.3 Replace defective or damaged materials with new.

Part 2 Products

2.1 MANUFACTURED UNITS

.1 Fixtures: manufacture in accordance with CAN/CSA-B45 series.

.2 Trim, fittings: manufacture in accordance with CSA B125.3.

.3 Exposed plumbing brass to be chrome plated.

.4 Number, locations: as indicated.

.5 Fixtures in any one location to be product of one manufacturer and of same type.

.6 Trim in any one location to be product of one manufacturer and of same type.

.7 Water closet (WC-1)

.1 Water Closet: Vitreous china, 6 Lpf low consumption, high performance pressure assisted two piece toilet, elongated ADA height front rim , siphon jet action, floor mounted toilet with 300mm standard rough-in.

.1 Standard of Acceptance

.1 Zurn Model: Z5560 or approved equal

.2 Water Closet Seat: Elongated, standard white, open front toilet seat, less cover, with self-sustaining stainless-steel check hinge.

.1 Standard of Acceptance

.1 Zurn Model: Z5956SS-EL-STS or approved equal

.8 Fixture piping:

.1 Hot and cold water supplies to fixtures:

.1 Chrome plated flexible supply pipes with handwheel stop, reducers, escutcheon.

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 washroom fixtures 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 INSTALLATION

.1 Mounting heights:

.1 Standard: to manufacturer's recommendations.

.2 Barrier-free: to most stringent of CSA B651 and NBC.

3.3 ADJUSTING

.1 Conform to water conservation requirements specified this section.

.2 Adjustments:

.1 Adjust water flow rate to design flow rates.

.2 Adjust pressure to fixtures to ensure no splashing at maximum pressures.

.3 Adjust flush valves to suit actual site conditions.

.4 Adjust urinal flush timing mechanisms.

.5 Set controls of automatic flush valves for WCs and urinals to prevent unnecessary flush cycles.

.3 Checks:

.1 Water closets, urinals: flushing action.

.2 Aerators: operation, cleanliness.

.3 Vacuum breakers, backflow preventers: operation under all conditions.

.4 Thermostatic controls:

.1 Verify temperature settings, operation of control, limit and safety controls.

3.4 CLEANING

.1 Leave Work area clean at end of each day.

END OF SECTION

Part 1 General

1.1 REFERENCE STANDARDS

.1 CSA Group (CSA)

.1 CAN/CSA-B45 Series, Plumbing Fixtures.

.2 CAN/CSA-B125.3, Plumbing Fittings.

.3 CAN/CSA-B651, Accessible Design for the Built Environment.

.2 National Research Council Canada (NRC)

.1 National Building Code of Canada 2015 (NBC).

1.2 ACTION AND INFORMATIONAL SUBMITTALS

.1 Provide submittals in accordance with Section 01 33 00- Submittal Procedures.

.2 Product Data:

.1 Provide manufacturer's printed product literature and datasheets for fixtures, and include product characteristics, performance criteria, physical size, finish and limitations.

1.3 CLOSEOUT SUBMITTALS

.1 Provide maintenance data in accordance with Section 01 78 00- Closeout Submittals.

.2 Include:

.1 Description of fixtures and trim, giving manufacturer's name, type, model, year, capacity.

.2 Details of operation, servicing, maintenance.

.3 List of recommended spare parts.

1.4 DELIVERY, STORAGE AND HANDLING

.1 Deliver, store and handle materials in accordance with Section with manufacturer's written instructions.

.2 Deliver materials to site in original factory packaging, labelled with manufacturer's name, address.

Part 2 Products

2.1 MANUFACTURED UNITS

.1 Fixtures: manufacture in accordance with CAN/CSA-B45 series.

.2 Trim, fittings: manufacture in accordance with CAN/CSA-B125.

.3 Exposed plumbing brass to be chrome plated.

.4 Number, locations: architectural drawings to govern.

.5 Fixtures to be product of one manufacturer.

.6 Trim to be product of one manufacturer.

.7 Wall Hung Lavatory (LAV-1)

.1 Lavatory: 508mm x 457mm vitreous china wall hung lavatory. Provided with hanger plate and holes for concealed arm carrier systems. Lavatory to be c/w ADA Trap, Stop, and Supply Protectors for Offset Grid Strainer, ADA Grid Strainer. Floor mount wall carrier.

.1 Standard of Acceptance

.1 Zurn Model: Z5348 or approved equal.

.2 Lavatory Trim:

.1 Polished chrome-plated widespread with adjustable centers, rigid or swing spout and quarter turn ceramic disc cartridges. Unit shall furnished with a standard 8.3 LPM aerator, vandal-resistant color-coded handles, mounting hardware and 13mm NPSM coupling nuts for standard lavatory risers. 102mm Vandal Resistant Color Coded Wrist Blade Handles

.2 Standard of Acceptance

.1 Zurn Model: Z831B4-XL or approved equal.

.8 Stainless Steel Counter Top Sink (S-1)

.1 Sink: Double compartment self rimming topmount sink with faucet ledge. 18 gauge (1.2 mm), type 304 (CNS 18/10) stainless steel. Exposed surfaces are #4 satin finished. Undercoated to reduce condensation and resonance. Includes waste fittings, factory applied rim seal, cutout template, and factory installed fasteners. Certified to ASME A112.19.3-2008 / CSA B45.4-08. Centre back waste location. Includes 89 mm crumb cup strainer with 38mm (DN38) brass tailpiece.

.1 Standard of Acceptance

.1 Frankie Model: LBD7510P or approved equal.

.2 Sink Trim: Polished chrome-plated widespread with adjustable centers, a 203mm centerline rigid or swing gooseneck spout and quarter turn ceramic disc cartridges. Unit is to be furnished with a 8.3 L pressure compensating aerator (complying with ANSI A112.18.1 Standard for flow), 152mm vandal-resistant color-coded metal wrist blade handles, mounting hardware and 13mm NPSM coupling nuts for standard lavatory risers. To be c/w Hose and Spray.

.1 Standard of Acceptance

.1 Zurn Model: Z831C6-XL or approved equal.

.3 Waste fitting: integral stainless steel basket strainer/stopper, tailpiece, cast brass P-trap with cleanout.

.9 Fixture piping:

.1 Hot and cold water supplies to each fixture:

.1 Chrome plated flexible supply pipes each with handwheel stop, reducers, escutcheon.

.2 Waste:

.1 Brass P trap with clean out on each fixture not having integral trap.

.2 Chrome plated in all exposed places.

.10 Chair carriers:

.1 Factory manufactured floor-mounted carrier systems for all wall-mounted fixtures.

Part 3 Execution

3.1 APPLICATION

.1 Manufacturer's Instructions: comply with manufacturer's written recommendations, including product technical bulletins, handling, storage and installation instructions, and datasheets.

3.2 INSTALLATION

.1 Mounting heights:

.1 Standard: to comply with manufacturer's recommendations unless otherwise indicated or specified.

.2 Physically handicapped: to comply with most stringent of either NBC or CAN/CSA-B651.

3.3 ADJUSTING

.1 Conform to water conservation requirements specified this section.

.2 Adjustments:

.1 Adjust water flow rate to design flow rates.

.2 Adjust pressure to fixtures to ensure no splashing at maximum pressures.

.3 Checks:

.1 Aerators: operation, cleanliness.

.2 Vacuum breakers, backflow preventers: operation under all conditions.

.3 Wash fountains: operation of flow-actuating devices.

.4 Thermostatic controls:

.1 Verify temperature settings, operation of control, limit and safety controls.

3.4 CLEANING

.1 Remove surplus materials, excess materials, rubbish, tools and equipment.

END OF SECTION

Part 1 General

1.1 REFERENCE STANDARDS

.1 American National Standards Institute (ANSI)/American Society of Mechanical Engineers (ASME)

.1 ANSI/ASME B1.20.1, Pipe Threads, General Purpose (Inch).

.2 ANSI/ASME B16.18, Cast Copper Alloy Solder Joint Pressure Fittings.

.2 ASTM International (ASTM)

.1 ASTM A276, Standard Specification for Stainless Steel Bars and Shapes.

.2 ASTM B62, Standard Specification for Composition Bronze or Ounce Metal Castings.

.3 ASTM B283, Standard Specification for Copper and Copper Alloy Die Forgings (Hot-Pressed).

.4 ASTM B505/B505M, Standard Specification for Copper-Base Alloy Continuous Castings.

.3 Manufacturers Standardization Society of the Valve and Fittings Industry, Inc. (MSS)

.1 MSS-SP-25, Standard Marking System for Valves, Fittings, Flanges and Unions.

.2 MSS-SP-80, Bronze Gate Globe, Angle and Check Valves.

.3 MSS-SP-110, Ball Valves, Threaded, Socket-Welding, Solder Joint, Grooved and Flared Ends.

1.2 ACTION AND INFORMATIONAL SUBMITTALS

.1 Provide submittals in accordance with Section 01 33 00- Submittal Procedures.

.2 Product Data:

.1 Provide manufacturer's printed product literature and data sheets for equipment and systems and include product characteristics, performance criteria, physical size, finish and limitations.

.3 Shop Drawings:

.1 Submit data for valves specified in this Section.

1.3 CLOSEOUT SUBMITTALS

.1 Provide maintenance data for incorporation into manual specified in Section 01 78 00- Closeout Submittals.

1.4 MAINTENANCE MATERIAL SUBMITTALS

.1 Extra Materials/Spare Parts:

.1 Furnish following spare parts:

.1 Valve seats: one for every 10 valves each size, minimum 1.

.2 Discs: one for every 10 valves, each size. Minimum 1.

.3 Stem packing: one for every 10 valves, each size. Minimum 1.

.4 Valve handles: 2 of each size.

.5 Gaskets for flanges: one for every 10 flanged joints.

.2 Tools:

.1 Furnish special tools for maintenance of systems and equipment.

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:

.1 Deliver materials to site in original factory packaging, labelled with manufacturer's name, address.

Part 2 Products

2.1 MATERIALS

.1 Valves:

.1 Except for specialty valves, to be single manufacturer.

.2 Products to have CRN registration numbers.

.2 End Connections:

.1 Connection into adjacent piping/tubing:

.1 Steel pipe systems: screwed ends to ANSI/ASME B1.20.1.

.2 Copper tube systems: solder ends to ANSI/ASME B16.18.

.3 Lockshield Keys:

.1 Where lockshield valves are specified, provide 10 keys of each size: malleable iron cadmium plated.

.4 Gate Valves:

.1 Requirements common to gate valves, unless specified otherwise:

.1 Standard specification: MSS SP-80.

.2 Bonnet: union with hexagonal shoulders.

.3 Connections: screwed with hexagonal shoulders.

.4 Inspection and pressure testing: to MSS SP-80. Tests to be hydrostatic.

.5 Packing: non-asbestos.

.6 Handwheel: non-ferrous.

.7 Handwheel Nut: bronze to ASTM B62.

.2 NPS 2 and under, non-rising stem, solid wedge disc, Class 125

.1 Body: with long disc guides, screwed bonnet with stem retaining nut.

.2 Operator: Handwheel.

.3 NPS 2 and under, non-rising stem, solid wedge disc, Class 150:

.1 Body: with long disc guides, screwed bonnet with stem retaining nut.

.2 Operator: handwheel.

.4 NPS 2 and under, rising stem, split wedge disc, Class 125:

.1 Body: with long disc guides, screwed bonnet.

.2 Disc: split wedge, bronze to ASTM B283, loosely secured to stem.

.3 Operator: handwheel.

.5 NPS 2 and under, rising stem, solid wedge disc, Class 125:

.1 Body: with long disc guides, screwed bonnet.

.2 Operator: handwheel.

.6 NPS 2 and under, rising stem, solid wedge disc, Class 150:

.1 Body: with long disc guides, screwed bonnet.

.2 Operator: handwheel.

.5 Globe Valves:

.1 Requirements common to globe valves, unless specified otherwise:

.1 Standard specification: MSS SP-80.

.2 Bonnet: union with hexagonal shoulders.

.3 Connections: screwed with hexagonal shoulders.

.4 Pressure testing: to MSS SP-80. Tests to be hydrostatic.

.5 Stuffing box: threaded to bonnet with gland follower, packing nut, high grade non-asbestos packing.

.6 Handwheel: non-ferrous.

.7 Handwheel Nut: bronze to ASTM B62.

.2 NPS 2 and under, composition disc, Class 125:

.1 Body and bonnet: screwed bonnet.

.2 Disc and seat: renewable rotating PTFE disc composition to suit service conditions, regrindable bronze seat, loosely secured to bronze stem to ASTM B505.

.3 Operator: handwheel.

.3 NPS 2 and under, composition disc, Class 150:

.1 Body and bonnet: union bonnet.

.2 Disc and seat: renewable rotating PTFE disc in easily removable disc holder, regrindable bronze seat, loosely secured to bronze stem to ASTM B505.

.3 Operator: handwheel.

.4 NPS 2 and under, plug disc, Class 150, screwed ends:

.1 Body and bonnet: union bonnet.

.2 Disc and seat ring: tapered plug type with disc stem ring of AISI S420 stainless steel to ASTM A276, loosely secured to stem.

.3 Operator: handwheel.

.5 Angle valve, NPS 2 and under, composition disc, Class 150:

.1 Body and bonnet: union bonnet.

.2 Disc and seat: renewable rotating PTFE disc in slip-on easily removable disc holder having integral guides, regrindable bronze seat, loosely secured to stem.

.3 Operator: handwheel.

.6 Check Valves:

.1 Requirements common to check valves, unless specified otherwise:

.1 Standard specification: MSS SP-80.

.2 Connections: screwed with hexagonal shoulders.

.2 NPS 2 and under, swing type, bronze disc, Class 125:

.1 Body: Y-pattern with integral seat at 45 degrees, screw-in cap with hex head.

.2 Disc and seat: renewable rotating disc, two-piece hinge disc construction; seat: regrindable.

.3 NPS 2 and under, swing type, bronze disc:

.1 Body: Y-pattern with integral seat at 45 degrees, screw-in cap with hex head.

.2 Disc and seat: renewable rotating disc, two-piece hinge disc construction; seat: regrindable.

.4 NPS 2 and under, swing type, composition disc, Class 200:

.1 Body: Y-pattern with integral seat at 45 degrees, screw-in cap with hex head.

.2 Disc: renewable rotating disc of number 6 composition to suit service conditions, bronze two-piece hinge disc construction.

.5 NPS 2 and under, horizontal lift type, composition disc, Class 150:

.1 Body: with integral seat, union bonnet ring with hex shoulders, cap.

.2 Disc: renewable PTFE rotating disc in disc holder having guides top and bottom, of bronze to ASTM B62.

.6 NPS 2 and under, vertical lift type, bronze disc, Class 125:

.1 Disc: rotating disc having guides top and bottom, disc guides, retaining rings.

.7 Silent Check Valves:

.1 NPS 2 and under:

.1 Body: cast high tensile bronze to ASTM B62 with integral seat.

.2 Pressure rating: Class 125.

.3 Connections: screwed ends to ANSI B1.20.1 and with hex. shoulders.

.4 Disc and seat: renewable rotating disc.

.5 Stainless steel spring, heavy duty.

.6 Seat: regrindable.

.8 Ball Valves:

.1 NPS 2 and under:

.1 Body and cap: cast high tensile bronze to ASTM B62.

.2 Pressure rating: Class125, 860 kPa steam.

.3 Connections: screwed ends to ANSI B1.20.1 and with hexagonal shoulders.

.4 Stem: tamperproof ball drive.

.5 Stem packing nut: external to body.

.6 Ball and seat: replaceable stainless steel solid ball and Teflon seats.

.7 Stem seal: TFE with external packing nut.

.8 Operator: removable lever handle.

Part 3 Execution

3.1 INSTALLATION

.1 Install rising stem valves in upright position with stem above horizontal.

.2 Remove internal parts before soldering.

.3 Install valves with unions at each piece of equipment arranged to allow servicing, maintenance, and equipment removal.

END OF SECTION

Part 1 General

1.1 REFERENCE STANDARDS

.1 American Society of Mechanical Engineers (ASME)

.1 ASME B31.1 , Power Piping.

.2 ASTM International (ASTM)

.1 ASTM A125, Standard Specification for Steel Springs, Helical, Heat-Treated.

.2 ASTM A307, Standard Specification for Carbon Steel Bolts and Studs, 60,000 PSI Tensile Strength.

.3 ASTM A563, Standard Specification for Carbon and Alloy Steel Nuts.

.3 Factory Mutual (FM)

.4 Manufacturer's Standardization Society of the Valves and Fittings Industry (MSS)

.1 MSS SP58, Pipe Hangers and Supports - Materials, Design and Manufacture.

.2 MSS SP69, Pipe Hangers and Supports - Selection and Application.

.3 MSS SP89, Pipe Hangers and Supports - Fabrication and Installation Practices.

.5 National Research Council Canada (NRC)

.1 National Plumbing Code of Canada (NPC).

.6 Underwriter's Laboratories of Canada (ULC)

1.2 ACTION AND INFORMATIONAL SUBMITTALS

.1 Provide submittals in accordance with Section 01 33 00- Submittal Procedures.

.2 Product Data:

.1 Provide manufacturer's printed product literature and data sheets for hangers and supports and include product characteristics, performance criteria, physical size, finish and limitations.

.3 Certificates:

.1 Submit certificates signed by manufacturer certifying that materials comply with specified performance characteristics and physical properties.

.4 Manufacturers' Instructions:

.1 Provide manufacturer's installation instructions.

1.3 CLOSEOUT SUBMITTALS

.1 Provide maintenance data 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:

.1 Deliver materials to site in original factory packaging, labelled with manufacturer's name, address.

Part 2 Products

2.1 SYSTEM DESCRIPTION

.1 Design Requirements:

.1 Construct pipe hanger and support to manufacturer's recommendations utilizing manufacturer's regular production components, parts and assemblies.

.2 Base maximum load ratings on allowable stresses prescribed by ASME B31.1 or MSS SP58.

.3 Ensure that supports, guides, anchors do not transmit excessive quantities of heat to building structure.

.4 Design hangers and supports to support systems under conditions of operation, allow free expansion and contraction, prevent excessive stresses from being introduced into pipework or connected equipment.

.5 Provide for vertical adjustments after erection and during commissioning. Amount of adjustment in accordance with MSS SP58.

2.2 GENERAL

.1 Fabricate hangers, supports and sway braces in accordance with MSS SP58. ANSI B31.1 and

.2 Use components for intended design purpose only. Do not use for rigging or erection purposes.

2.3 PIPE HANGERS

.1 Finishes:

.1 Pipe hangers and supports: galvanized after manufacture.

.2 Use electro-plating galvanizing process.

.3 Ensure steel hangers in contact with copper piping are epoxy coated.

.2 Upper attachment structural: suspension from lower flange of I-Beam:

.1 Cold piping NPS 2 maximum: malleable iron C-clamp with hardened steel cup point setscrew, locknut carbon steel retaining clip.

.1 Rod: 13 mm FM approved.

.2 Cold piping NPS 2 1/2 or greater, hot piping: malleable iron beam clamp, eye rod, jaws and extension with carbon steel retaining clip, tie rod, nuts and washers, UL listed.

.3 Upper attachment structural: suspension from upper flange of I-Beam:

.1 Cold piping NPS 2 maximum: ductile iron top-of-beam C-clamp with hardened steel cup point setscrew, locknut and carbon steel retaining clip, UL listed.

.2 Cold piping NPS 2 1/2 or greater, hot piping: malleable iron top-of-beam jaw-clamp with hooked rod, spring washer, plain washer and nut UL listed.

.4 Upper attachment to concrete:

.1 Ceiling: carbon steel welded eye rod, clevis plate, clevis pin and cotters with weldless forged steel eye nut. Ensure eye 6 mm minimum greater than rod diameter.

.2 Concrete inserts: wedge shaped body with knockout protector plate UL listed to MSS SP69.

.5 Shop and field-fabricated assemblies:

.1 Trapeze hanger assemblies

.6 Hanger rods: threaded rod material to MSS SP58:

.1 Ensure that hanger rods are subject to tensile loading only.

.2 Provide linkages where lateral or axial movement of pipework is anticipated.

.3 Do not use 22 mm or 28 mm rod.

.7 Pipe attachments: material to MSS SP58:

.1 Attachments for steel piping: carbon steel galvanized.

.2 Attachments for copper piping: copper plated black steel.

.3 Use insulation shields for hot pipework.

.4 Oversize pipe hangers and supports.

.8 Adjustable clevis: material to MSS SP69 UL listed, clevis bolt with nipple spacer and vertical adjustment nuts above and below clevis.

.1 Ensure "U" has hole in bottom for rivetting to insulation shields.

.9 Yoke style pipe roll: carbon steel yoke, rod and nuts with cast iron roll, to MSS SP69.

.10 U-bolts: carbon steel to MSS SP69 with 2 nuts at each end to ASTM A563.

.1 Finishes for steel pipework: galvanized.

.2 Finishes for copper, glass, brass or aluminum pipework: epoxy coated, with formed portion plastic coated.

.11 Pipe rollers: cast iron roll and roll stand with carbon steel rod to MSS SP69.

2.4 RISER CLAMPS

.1 Steel or cast iron pipe: galvanized black carbon steel to MSS SP58, type 42, UL listed.

.2 Copper pipe: carbon steel copper plated to MSS SP58, type 42.

.3 Bolts: to ASTM A307.

.4 Nuts: to ASTM A563.

2.5 INSULATION PROTECTION SHIELDS

.1 Insulated cold piping:

.1 64 kg/m^{3}density insulation plus insulation protection shield to: MSS SP69, galvanized sheet carbon steel. Length designed for maximum 3 m span.

.2 Insulated hot piping:

.1 Curved plate 300 mm long, with edges turned up, welded-in centre plate for pipe sizes NPS 12 and over, carbon steel to comply with MSS SP69.

2.6 CONSTANT SUPPORT SPRING HANGERS

.1 Springs: alloy steel to ASTM A125, shot peened, magnetic particle inspected, with +/-5% spring rate tolerance, tested for free height, spring rate, loaded height and provided with Certified Mill Test Report (CMTR).

.2 Load adjustability: 10 % minimum adjustability each side of calibrated load. Adjustment without special tools. Adjustments not to affect travel capabilities.

.3 Provide upper and lower factory set travel stops.

.4 Provide load adjustment scale for field adjustments.

.5 Total travel to be actual travel + 20%. Difference between total travel and actual travel 25 mm minimum.

.6 Individually calibrated scales on each side of support calibrated prior to shipment, complete with calibration record.

2.7 VARIABLE SUPPORT SPRING HANGERS

.1 Vertical movement: 13 mm minimum, 50 mm maximum, use single spring pre-compressed variable spring hangers.

.2 Vertical movement greater than 50 mm: use double spring pre-compressed variable spring hanger with 2 springs in series in single casing.

.3 Variable spring hanger complete with factory calibrated travel stops. Provide certificate of calibration for each hanger.

.4 Steel alloy springs: to ASTM A125, shot peened, magnetic particle inspected, with +/-5 % spring rate tolerance, tested for free height, spring rate, loaded height and provided with CMTR.

2.8 EQUIPMENT SUPPORTS

.1 Fabricate equipment supports not provided by equipment manufacturer from structural grade steel. Submit engineered stamped drawings with shop drawings.

2.9 EQUIPMENT ANCHOR BOLTS AND TEMPLATES

.1 Provide templates to ensure accurate location of anchor bolts.

2.10 HOUSE-KEEPING PADS

.1 Provide 100 mm high concrete housekeeping pads for base-mounted equipment; size pads 75 mm larger than equipment; chamfer pad edges.

Part 3 Execution

3.1 MANUFACTURER'S INSTRUCTIONS

.1 Compliance: comply with manufacturer's written recommendations or specifications, including product technical bulletins, handling, storage and installation instructions, and datasheet.

3.2 INSTALLATION

.1 Install in accordance with:

.1 Manufacturer's instructions and recommendations.

.2 Clamps on riser piping:

.1 Support independent of connected horizontal pipework using riser clamps and riser clamp lugs welded to riser.

.2 Bolt-tightening torques to industry standards.

.3 Steel pipes: install below coupling or shear lugs welded to pipe.

.4 Cast iron pipes: install below joint.

.3 Clevis plates:

.1 Attach to concrete with 4 minimum concrete inserts, one at each corner.

.4 Provide supplementary structural steelwork where structural bearings do not exist or where concrete inserts are not in correct locations.

.5 Use approved constant support type hangers where:

.1 Vertical movement of pipework is 13 mm or more,

.2 Transfer of load to adjacent hangers or connected equipment is not permitted.

.6 Use variable support spring hangers where:

.1 Transfer of load to adjacent piping or to connected equipment is not critical.

.2 Variation in supporting effect does not exceed 25 % of total load.

3.3 HANGER SPACING

.1 Plumbing piping: to the most stringent of pipe / equipment manufactures recommendations, Provincial Code, National Plumbing Code of Canada (NPC), and authority having jurisdiction.

.2 Fire protection: to applicable fire code.

.3 Gas and fuel oil piping: up to NPS 1/2: every 1.8 m.

.4 Copper piping: up to NPS 1/2: every 1.5 m.

.5 Flexible joint roll groove pipe: in accordance with table below for steel, but not less than one hanger at joints. Table listings for straight runs without concentrated loads and where full linear movement is not required.

.6 Within 300 mm of each elbow.

Maximum Pipe Size : NPS	Maximum Spacing Steel	Maximum Spacing Copper
up to 1-1/4	2.4 m	1.8 m
1-1/2	3.0 m	2.4 m
2	3.0 m	2.4 m
2-1/2	3.7 m	3.0 m
3	3.7 m	3.0 m
3-1/2	3.7 m	3.3 m
4	3.7 m	3.6 m
5	4.3 m	
6	4.3 m	
8	4.3 m	
10	4.9 m	
12	4.9 m	

.7 Pipework greater than NPS 12: to MSS SP69.

3.4 HANGER INSTALLATION

.1 Install hanger so that rod is vertical under operating conditions.

.2 Adjust hangers to equalize load.

.3 Support from structural members. Where structural bearing does not exist or inserts are not in suitable locations, provide supplementary structural steel members.

3.5 HORIZONTAL MOVEMENT

.1 Angularity of rod hanger resulting from horizontal movement of pipework from cold to hot position not to exceed 4 degrees from vertical.

.2 Where horizontal pipe movement is less than 13 mm, offset pipe hanger and support so that rod hanger is vertical in the hot position.

3.6 FINAL ADJUSTMENT

.1 Adjust hangers and supports:

.1 Ensure that rod is vertical under operating conditions.

.2 Equalize loads.

.2 Adjustable clevis:

.1 Tighten hanger load nut securely to ensure proper hanger performance.

.2 Tighten upper nut after adjustment.

.3 C-clamps:

.1 Follow manufacturer's recommended written instructions and torque values when tightening C-clamps to bottom flange of beam.

.4 Beam clamps:

.1 Hammer jaw firmly against underside of beam.

3.7 CLEANING

.1 Remove surplus materials, excess materials, rubbish, tools and equipment.

END OF SECTION

Part 1 General

1.1 SUMMARY

.1 Section Includes:

.1 Materials and requirements for the identification of piping systems, duct work, valves and controllers, including the installation and location of identification systems.

1.2 REFERENCE STANDARDS

.1 Canadian Gas Association (CGA)

.1 CSA/CGA B149.1, Natural Gas and Propane Installation Code.

.2 Canadian General Standards Board (CGSB)

.1 CAN/CGSB-1.60, Interior Alkyd Gloss Enamel.

.2 CAN/CGSB-24.3, Identification of Piping Systems.

.3 National Fire Protection Association (NFPA)

.1 NFPA 13, Standard for the Installation of Sprinkler Systems.

.2 NFPA 14, Standard for the Installation of Standpipe and Hose Systems.

1.3 ACTION AND INFORMATIONAL SUBMITTALS

.1 Product Data:

.2 Submittals: in accordance with Section 01 33 00- Submittal Procedures.

.3 Product data to include paint colour chips, other products specified in this section.

.4 Samples:

.1 Submit samples in accordance with Section 01 33 00- Submittal Procedures.

.2 Samples to include nameplates, labels, tags, lists of proposed legends.

1.4 DELIVERY, STORAGE, AND HANDLING

.1 Packing, shipping, handling and unloading:

.1 Deliver, store and handle materials in accordance with manufacturer's written instructions.

Part 2 Products

2.1 SUSTAINABLE REQUIREMENTS

2.2 MANUFACTURER'S EQUIPMENT NAMEPLATES

.1 Metal or plastic laminate nameplate mechanically fastened to each piece of equipment by manufacturer.

.2 Lettering and numbers raised or recessed.

.3 Information to include, as appropriate:

.1 Equipment: manufacturer's name, model, size, serial number, capacity.

.2 Motor: voltage, Hz, phase, power factor, duty, frame size.

2.3 SYSTEM NAMEPLATES

.1 Colours:

.1 Hazardous: red letters, white background.

.2 Elsewhere: black letters, white background (except where required otherwise by applicable codes).

.2 Construction:

.1 3 mm thick laminated plastic, matte finish, with square corners, letters accurately aligned and machine engraved into core.

.3 Sizes:

.1 Conform to following table:

Size # mm	Sizes (mm)	No. of Lines	Height of Letters (mm)
1	10 x 50	1	3
2	13 x 75	1	5
3	13 x 75	2	3
4	20 x 100	1	8
5	20 x 100	2	5
6	20 x 200	1	8
7	25 x 125	1	12
8	25 x 125	2	8
9	35 x 200	1	20

.2 Use maximum of 25 letters/numbers per line.

.4 Locations:

.1 Terminal cabinets, control panels: use size # 5.

.2 Equipment in Mechanical Rooms: use size # 9.

2.4 EXISTING IDENTIFICATION SYSTEMS

.1 Apply existing identification system to new work.

.2 Where existing identification system does not cover for new work, use identification system specified this section.

.3 Before starting work, obtain written approval of identification system from Consultant.

2.5 PIPING SYSTEMS GOVERNED BY CODES

.1 Identification:

.1 Natural gas: to most stringent of authority having jurisdiction or CSA/CGA B149.1.

.2 Propane gas: to most stringent of authority having jurisdiction or CSA/CGA B149.1.

.3 Sprinklers: to NFPA 13.

.4 Standpipe and hose systems: to NFPA 14.

2.6 IDENTIFICATION OF PIPING SYSTEMS

.1 Identify contents by background colour marking, pictogram (as necessary), legend; direction of flow by arrows. To CAN/CGSB 24.3 except where specified otherwise.

.2 Pictograms:

.1 Where required: Workplace Hazardous Materials Information System (WHMIS) regulations.

.3 Legend:

.1 Block capitals to sizes and colours listed in CAN/CGSB 24.3.

.4 Arrows showing direction of flow:

.1 Outside diameter of pipe or insulation less than 75 mm: 100 mm long x 50 mm high.

.2 Outside diameter of pipe or insulation 75 mm and greater: 150 mm long x 50 mm high.

.3 Use double-headed arrows where flow is reversible.

.5 Extent of background colour marking:

.1 To full circumference of pipe or insulation.

.2 Length to accommodate pictogram, full length of legend and arrows.

.6 Materials for background colour marking, legend, arrows:

.1 Pipes and tubing 20 mm and smaller: waterproof and heat-resistant pressure sensitive plastic marker tags.

.2 Other pipes: pressure sensitive vinyl with protective overcoating, waterproof contact adhesive undercoating, suitable for ambient of 100% RH and continuous operating temperature of 150 degrees C and intermittent temperature of 200 degrees C.

.7 Colours and Legends:

.1 Where not listed, obtain direction from Consultant.

.2 Colours for legends, arrows: to following table:

Background colour:	Legend, arrows:
Yellow	BLACK
Green	WHITE
Red	WHITE

.3 Background colour marking and legends for piping systems:

Contents	Background colour marking	Legend
Domestic hot water supply	Green	DOM. HWS
Domestic cold water supply	Green	DOM. CWS
Sanitary	Green	SAN
Plumbing vent	Green	SAN. VENT

2.7 IDENTIFICATION DUCTWORK SYSTEMS

.1 50 mm high stencilled letters and directional arrows 150 mm long x 50 mm high.

.2 Colours: back, or co-ordinated with base colour to ensure strong contrast.

2.8 LANGUAGE

.1 Identification in English.

Part 3 Execution

3.1 MANUFACTURER'S INSTRUCTIONS

.1 Compliance: comply with manufacturer's written recommendations or specifications, including product technical bulletins, handling, storage and installation instructions, and datasheet.

3.2 TIMING

.1 Provide identification only after painting.

3.3 INSTALLATION

.1 Perform work in accordance with CAN/CGSB-24.3 except as specified otherwise.

3.4 NAMEPLATES

.1 Locations:

.1 In conspicuous location to facilitate easy reading and identification from operating floor.

.2 Standoffs:

.1 Provide for nameplates on hot and/or insulated surfaces.

.3 Protection:

.1 Do not paint, insulate or cover.

3.5 LOCATION OF IDENTIFICATION ON PIPING AND DUCTWORK SYSTEMS

.1 On long straight runs in open areas in boiler rooms, equipment rooms, galleries, tunnels: at not more than 17 m intervals and more frequently if required to ensure that at least one is visible from any one viewpoint in operating areas and walking aisles.

.2 Adjacent to each change in direction.

.3 At least once in each small room through which piping or ductwork passes.

.4 On both sides of visual obstruction or where run is difficult to follow.

.5 On both sides of separations such as walls, floors, partitions.

.6 Where system is installed in pipe chases, ceiling spaces, galleries, confined spaces, at entry and exit points, and at access openings.

.7 At beginning and end points of each run and at each piece of equipment in run.

.8 At point immediately upstream of major manually operated or automatically controlled valves, and dampers. Where this is not possible, place identification as close as possible, preferably on upstream side.

.9 Identification easily and accurately readable from usual operating areas and from access points.

.1 Position of identification approximately at right angles to most convenient line of sight, considering operating positions, lighting conditions, risk of physical damage or injury and reduced visibility over time due to dust and dirt.

3.6 CLEANING

.1 Upon completion and verification of performance of installation, remove surplus materials, excess materials, rubbish, tools and equipment.

END OF SECTION

Part 1 General

1.1 SUMMARY

.1 TAB is used throughout this Section to describe the process, methods and requirements of testing, adjusting and balancing for HVAC.

.2 TAB means to test, adjust and balance to perform in accordance with requirements of Contract Documents and to do other work as specified in this section.

1.2 QUALIFICATIONS OF TAB PERSONNEL

.1 Provide documentation confirming qualifications, successful experience.

.2 TAB: performed in accordance with the requirements of standard under which TAB Firm's qualifications are approved:

.1 Associated Air Balance Council, (AABC) National Standards for Total System Balance, MN-1.

.2 National Environmental Balancing Bureau (NEBB) TABES, Procedural Standards for Testing, Adjusting, Balancing of Environmental Systems.

.3 Sheet Metal and Air Conditioning Contractors' National Association (SMACNA), HVAC TAB HVAC Systems - Testing, Adjusting and Balancing.

.3 Recommendations and suggested practices contained in the TAB Standard: mandatory.

.4 Use TAB Standard provisions, including checklists, and report forms to satisfy Contract requirements.

.5 Use TAB Standard for TAB, including qualifications for TAB Firm and Specialist and calibration of TAB instruments.

.6 Where instrument manufacturer calibration recommendations are more stringent than those listed in TAB Standard, use manufacturer's recommendations.

.7 TAB Standard quality assurance provisions such as performance guarantees form part of this contract.

.1 For systems or system components not covered in TAB Standard, use TAB procedures developed by TAB Specialist.

.2 Where new procedures, and requirements, are applicable to Contract requirements have been published or adopted by body responsible for TAB Standard used (AABC, NEBB, or TABB), requirements and recommendations contained in these procedures and requirements are mandatory.

1.3 PURPOSE OF TAB

.1 Test to verify proper and safe operation, determine actual point of performance, evaluate qualitative and quantitative performance of equipment, systems and controls at design, average and low loads using actual or simulated loads

.2 Adjust and regulate equipment and systems to meet specified performance requirements and to achieve specified interaction with other related systems under normal and emergency loads and operating conditions.

.3 Balance systems and equipment to regulate flow rates to match load requirements over full operating ranges.

1.4 EXCEPTIONS

.1 TAB of systems and equipment regulated by codes, standards to satisfaction of authority having jurisdiction.

1.5 CO-ORDINATION

.1 Schedule time required for TAB (including repairs, re-testing) into project construction and completion schedule to ensure completion before acceptance of project.

.2 Do TAB of each system independently and subsequently, where interlocked with other systems, in unison with those systems.

1.6 PRE-TAB REVIEW

.1 Review Contract Documents before project construction is started confirm in writing to Consultant adequacy of provisions for TAB and other aspects of design and installation pertinent to success of TAB.

.2 Review specified standards and report to Consultant in writing proposed procedures which vary from standard.

.3 During construction, co-ordinate location and installation of TAB devices, equipment, accessories, measurement ports and fittings.

1.7 START-UP

.1 Follow start-up procedures as recommended by equipment manufacturer unless specified otherwise.

.2 Follow special start-up procedures specified elsewhere in Division 23.

1.8 OPERATION OF SYSTEMS DURING TAB

.1 Operate systems for length of time required for TAB and as required for verification of TAB reports.

1.9 START OF TAB

.1 Notify Consultant 7 days prior to start of TAB.

.2 Start TAB when building is essentially completed, including:

.1 Installation of ceilings, doors, windows, other construction affecting TAB.

.2 Application of weatherstripping, sealing, and caulking.

.3 Pressure, leakage, other tests specified elsewhere Division 23.

.4 Provisions for TAB installed and operational.

.3 Start-up, verification for proper, normal and safe operation of mechanical and associated electrical and control systems affecting TAB including but not limited to:

.1 Proper thermal overload protection in place for electrical equipment.

.2 Air systems:

.1 Filters in place, clean.

.2 Duct systems clean.

.3 Ducts, air shafts, ceiling plenums are airtight to within specified tolerances.

.4 Correct fan rotation.

.5 Fire, smoke, volume control dampers installed and open.

.6 Coil fins combed, clean.

.7 Access doors, installed, closed.

.8 Outlets installed, volume control dampers open.

.3 Liquid systems:

.1 Flushed, filled, vented.

.2 Correct pump rotation.

.3 Strainers in place, baskets clean.

.4 Isolating and balancing valves installed, open.

.5 Calibrated balancing valves installed, at factory settings.

.6 Chemical treatment systems complete, operational.

1.10 APPLICATION TOLERANCES

.1 Do TAB to following tolerances of design values:

.1 HVAC systems: plus 10%, minus 10 %.

.2 Hydronic systems: plus or minus 10 %.

1.11 ACCURACY TOLERANCES

.1 Measured values accurate to within plus or minus 2 % of actual values.

1.12 INSTRUMENTS

.1 Prior to TAB, submit to Consultantlist of instruments used together with serial numbers.

.2 Calibrate in accordance with requirements of most stringent of referenced standard for either applicable system or HVAC system.

.3 Calibrate within 3 months of TAB. Provide certificate of calibration to Consultant.

1.13 ACTION AND INFORMATIONAL SUBMITTALS

.1 Submit, prior to commencement of TAB:

.2 Proposed methodology and procedures for performing TAB if different from referenced standard.

1.14 PRELIMINARY TAB REPORT

.1 Submit for checking and approval of Consultant, prior to submission of formal TAB report, sample of rough TAB sheets. Include:

.1 Details of instruments used.

.2 Details of TAB procedures employed.

.3 Calculations procedures.

.4 Summaries.

1.15 TAB REPORT

.1 TAB report to show results in SI and IP units and to include:

.1 Project record drawings.

.2 System schematics.

.2 Submit electronic copies of TAB Report to Consultant for verification and approval, in English, complete with index.

1.16 VERIFICATION

.1 Reported results subject to verification by Consultant.

.2 Provide personnel and instrumentation to verify up to 30 % of reported results.

.3 Number and location of verified results as directed by Consultant.

.4 Pay costs to repeat TAB as required to satisfaction of Consultant.

1.17 SETTINGS

.1 After TAB is completed to satisfaction of Consultant, replace drive guards, close access doors, lock devices in set positions, ensure sensors are at required settings.

.2 Permanently mark settings to allow restoration at any time during life of facility. Do not eradicate or cover markings.

1.18 COMPLETION OF TAB

.1 TAB considered complete when final TAB Report received and approved by Consultant.

1.19 AIR SYSTEMS

.1 Standard: TAB to most stringent of this section, TAB standards of SMACNA, AABC, ASHRAE and NEBB.

.2 Do TAB of all new systems, equipment, components, and controls.

.3 Measurements: to include as appropriate for systems, equipment, components, controls: air velocity, static pressure, flow rate, pressure drop (or loss), temperatures (dry bulb, wet bulb, dewpoint), duct cross-sectional area, RPM, electrical power, voltage, noise, vibration.

.4 Locations of equipment measurements: to include as appropriate:

.1 Inlet and outlet of dampers, filter, coil, humidifier, fan, other equipment causing changes in conditions.

.2 At controllers, controlled device.

.5 Locations of systems measurements to include as appropriate: main ducts, main branch, sub-branch, run-out (or grille, register or diffuser).

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 REFERENCE STANDARDS

.1 American Society of Heating, Refrigeration and Air Conditioning Engineers (ASHRAE)

.1 ANSI/ASHRAE/IESNA 90.1, SI; Energy Standard for Buildings Except Low-Rise Residential Buildings.

.2 ASTM International (ASTM)

.1 ASTM B209M, Standard Specification for Aluminum and Aluminum-Alloy Sheet and Plate (Metric).

.2 ASTM C335, Standard Test Method for Steady State Heat Transfer Properties of Pipe Insulation.

.3 ASTM C411, Standard Test Method for Hot-Surface Performance of High-Temperature Thermal Insulation.

.4 ASTM C449/C449M, Standard Specification for Mineral Fiber-Hydraulic-Setting Thermal Insulating and Finishing Cement.

.5 ASTM C547, Standard Specification for Mineral Fiber Pipe Insulation.

.6 ASTM C553, Standard Specification for Mineral Fiber Blanket Thermal Insulation for Commercial and Industrial Applications.

.7 ASTM C612, Standard Specification for Mineral Fiber Block and Board Thermal Insulation.

.8 ASTM C795, Standard Specification for Thermal Insulation for Use in Contact with Austenitic Stainless Steel.

.9 ASTM C921, Standard Practice for Determining the Properties of Jacketing Materials for Thermal Insulation.

.3 Canadian General Standards Board (CGSB)

.1 CGSB 51-GP-52Ma, Vapour Barrier, Jacket and Facing Material for Pipe, Duct and Equipment Thermal Insulation.

.4 Green Seal Environmental Standards (GSES)

.1 Standard GS-36, Commercial Adhesives.

.5 South Coast Air Quality Management District (SCAQMD), California State

.1 SCAQMD Rule 1168, Adhesive and Sealant Applications.

.6 Thermal Insulation Association of Canada (TIAC): National Insulation Standards

.7 Underwriters Laboratories of Canada (ULC)

.1 CAN/ULC-S102, Method of Test for Surface Burning Characteristics of Building Materials and Assemblies.

.2 CAN/ULC-S701, Standard for Thermal Insulation, Polystyrene, Boards and Pipe Covering.

1.2 DEFINITIONS

.1 For purposes of this section:

.1 "CONCEALED" - insulated mechanical services and equipment in suspended ceilings and non-accessible chases and furred-in spaces.

.2 "EXPOSED" - means "not concealed" as previously defined.

.3 Insulation systems - insulation material, fasteners, jackets, and other accessories.

.2 TIAC Codes:

.1 CRD: Code Round Ductwork,

.2 CRF: Code Rectangular Finish.

1.3 ACTION AND INFORMATIONAL SUBMITTALS

.1 Provide submittals in accordance with Section 01 33 00- Submittal Procedures.

.2 Manufacturers' Instructions:

.1 Provide manufacture's written duct insulation jointing recommendations. and special handling criteria, installation sequence, and cleaning procedures.

1.4 QUALITY ASSURANCE

.1 Qualifications:

.1 Installer: specialist in performing work of this section, and have at least 3 years successful experience in this size and type of project.

1.5 DELIVERY, STORAGE AND HANDLING

.1 Deliver materials to site in original factory packaging, labelled with manufacturer's name, address and ULC markings.

Part 2 Products

2.1 FIRE AND SMOKE RATING

.1 To CAN/ULC-S102:

.1 Maximum flame spread rating: 25.

.2 Maximum smoke developed rating: 50.

2.2 INSULATION

.1 Mineral fibre: as specified includes glass fibre, rock wool, slag wool.

.2 Thermal conductivity ("k" factor) not to exceed specified values at 24 degrees C mean temperature when tested in accordance with ASTM C335.

.3 TIAC Code C-1: Rigid mineral fibre board to ASTM C612, with factory applied vapour retarder jacket to CGSB 51-GP-52Ma (as scheduled in PART 3 of this Section).

.4 TIAC Code C-2: Mineral fibre blanket to ASTM C553 faced with factory applied vapour retarder jacket to CGSB 51-GP-52Ma (as scheduled in PART 3 of this section).

.1 Mineral fibre: to ASTM C553.

.2 Jacket: to CGSB 51-GP-52Ma.

.3 Maximum "k" factor: to ASTM C553.

2.3 JACKETS

.1 VentureClad Insulation Jacketing System by 3M:

.1 Product Thickness minimum 0.5mm

.2 Color to be selected by consultant.

.2 Aluminum:

.1 To ASTM B209 with moisture barrier as scheduled in PART 3 of this section.

.2 Thickness: 0.50 mm sheet.

.3 Finish: Stucco embossed.

.4 Jacket banding and mechanical seals: 19 mm wide, 0.5 mm thick stainless steel.

.1 Stainless steel:

.5 Type: 316 .

.6 Thickness: 0.50 mm sheet.

.7 Finish: Smooth.

.8 Jacket banding and mechanical seals: 19 mm wide, 0.5 mm thick stainless steel.

2.4 ACCESSORIES

.1 Vapour retarder lap adhesive:

.1 Water based, fire retardant type, compatible with insulation.

.2 Indoor Vapour Retarder Finish:

.1 Vinyl emulsion type acrylic, compatible with insulation.

.3 Insulating Cement: hydraulic setting on mineral wool, to ASTM C449.

.4 Outdoor Vapour Retarder Mastic:

.1 Vinyl emulsion type acrylic, compatible with insulation.

.2 Reinforcing fabric: Fibrous glass, untreated 305 g/m^2.

.5 Tape: self-adhesive, aluminum, reinforced, 75 mm wide minimum.

.6 Contact adhesive: quick-setting

.7 Tie wire: 1.5 mm stainless steel.

.8 Banding: 19 mm wide, 0.5 mm thick stainless steel.

.9 Facing: 25 mm stainless steel hexagonal wire mesh stitched on both faces of insulation.

.10 Fasteners: 4 mm diameter pins with 35 mm diameter clips, length to suit thickness of insulation.

Part 3 Execution

3.1 APPLICATION

.1 Manufacturer's Instructions: comply with manufacturer's written recommendations, including product technical bulletins, handling, storage and installation instructions, and datasheets.

3.2 PRE-INSTALLATION REQUIREMENTS

.1 Pressure test ductwork systems complete, witness and certify.

.2 Ensure surfaces are clean, dry, free from foreign material.

3.3 INSTALLATION

.1 Install in accordance with TIAC National Standards.

.2 Apply materials in accordance with manufacturers instructions and as indicated.

.3 Use 2 layers with staggered joints when required nominal thickness exceeds 75 mm.

.4 Maintain uninterrupted continuity and integrity of vapour retarder jacket and finishes.

.1 Ensure hangers, and supports are outside vapour retarder jacket.

.5 Apply high compressive strength insulation where insulation may be compressed by weight of ductwork.

.6 Fasteners: install at 300 mm on centre in horizontal and vertical directions, minimum 2 rows each side.

3.4 DUCTWORK INSULATION SCHEDULE

.1 Insulation types and thicknesses: conform to following table:

	TIAC Code	Vapour Retarder	Thickness (mm)
Rectangular cold and dual temperature supply air ducts	C-1	yes	50
Round cold and dual temperature supply air ducts	C-2	yes	50
Rectangular warm air ducts	C-1	yes	50
Round warm air ducts	C-2	yes	50
Supply, return and exhaust ducts exposed in space being served	none		
Outside air ducts	C-1	yes	50
Mixing plenums	C-1	yes	50
Exhaust duct between dampers and louvres	C-1	yes	50
Rectangular ducts outside	C-1	yes	50
Round ducts outside	C-1	yes	50
Acoustically lined ducts	none		

.2 Exposed round ducts 600 mm and larger, smaller sizes where subject to abuse:

.1 Use TIAC code C-1 insulation, scored to suit diameter of duct.

.1 Finishes: conform to following table:

	Rectangular	Round
Indoor, concealed	none	none
Indoor, exposed within mechanical room	VentureClad	VentureClad
Indoor, exposed elsewhere	VentureClad	VentureClad
Outdoor, exposed to precipitation	VentureClad & Aluminum Jacketing	VentureClad & Aluminum Jacketing
Outdoor, elsewhere	VentureClad	VentureClad

END OF SECTION

Part 1 General

1.1 REFERENCE STANDARDS

.1 American Society of Heating, Refrigerating and Air-Conditioning Engineers (ASHRAE)

.2 ASTM International (ASTM)

.1 ASTM A480/A480M, Standard Specification for General Requirements for Flat-Rolled Stainless and Heat-Resisting Steel Plate, Sheet and Strip.

.2 ASTM A635/A635M, Standard Specification for Steel, Sheet and Strip, Heavy-Thickness Coils, Hot-Rolled, Alloy, Carbon, Structural, High-Strength Low-Alloy, and High-Strength Low-Alloy with Improved Formability, General Requirements for.

.3 ASTM A653/A653M, Standard Specification for Steel Sheet, Zinc Coated (Galvanized) or Zinc-Iron Alloy Coated (Galvannealed) by the Hot-Dip Process.

.3 Green Seal Environmental Standards (GS)

.1 GS-36, Standard for Adhesives for Commercial Use.

.4 National Fire Protection Association (NFPA)

.1 NFPA 90A, Standard for the Installation of Air-Conditioning and Ventilating Systems.

.2 NFPA 90B, Standard for the Installation of Warm Air Heating and Air-Conditioning Systems.

.3 NFPA 96, Standard for Ventilation Control and Fire Protection of Commercial Cooking Operations.

.5 Sheet Metal and Air Conditioning Contractors' National Association (SMACNA)

.1 SMACNA HVAC Duct Construction Standards - Metal and Flexible.

.2 SMACNA HVAC Air Duct Leakage Test Manual.

.3 IAQ Guideline for Occupied Buildings Under Construction.

.6 South Coast Air Quality Management District (SCAQMD), California State, Regulation XI. Source Specific Standards

.1 SCAQMD Rule 1168, Adhesives and Sealants Applications.

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 metal ducts and include product characteristics, performance criteria, physical size, finish and limitations.

1.3 DELIVERY, STORAGE AND HANDLING

.1 Delivery and Acceptance Requirements: deliver materials to site in original factory packaging, labelled with manufacturer's name and address.

.2 Storage and Handling Requirements:

.1 Store materials in accordance with manufacturer's recommendations in clean, dry, well-ventilated area.

.2 Store and protect metal ducts from nicks, scratches, and blemishes.

.3 Replace defective or damaged materials with new.

Part 2 Products

2.1 SEAL CLASSIFICATION

.1 Classification as follows:

Maximum Pressure Pa	SMACNA Seal Class
500	C
250	C
125	C
125	Unsealed

.2 Seal classification:

.1 Class A: longitudinal seams, transverse joints, duct wall penetrations and connections made airtight with sealant and tape.

.2 Class B: longitudinal seams, transverse joints and connections made airtight with combination thereof tape and sealant.

.3 Class C: transverse joints and connections made air tight with gaskets, sealant or combination thereof . Longitudinal seams unsealed.

.4 Unsealed seams and joints.

2.2 SEALANT

.1 Sealant: oil resistant, water borne, polymer type flame resistant duct sealant. Temperature range of minus 30 degrees C to plus 93 degrees C.

2.3 TAPE

.1 Tape: polyvinyl treated, open weave fiberglass tape, 50 mm wide.

2.4 DUCT LEAKAGE

.1 In accordance with SMACNA HVAC Air Duct Leakage Test Manual.

2.5 FITTINGS

.1 Fabrication: to SMACNA.

.2 Radiused elbows:

.1 Rectangular: standard radius.

.2 Round: smooth radius, centreline radius: 1.5 times diameter.

.3 Mitred elbows, rectangular:

.1 To 400 mm: with single thickness turning vanes.

.2 Over 400 mm: with double thickness turning vanes.

.4 Branches:

.1 Rectangular main and branch: with 45 degrees entry on branch.

.2 Round main and branch: enter main duct at 45 degrees with conical connection.

.3 Provide volume control damper in branch duct near connection to main duct.

.4 Main duct branches: with splitter damper.

.5 Transitions:

.1 Diverging: 20 degrees maximum included angle.

.2 Converging: 30 degrees maximum included angle.

.6 Offsets:

.1 as indicated.

.7 Obstruction deflectors: maintain full cross-sectional area.

.1 Maximum included angles: as for transitions.

2.6 FIRE STOPPING

.1 Retaining angles around duct, on both sides of fire separation.

.2 Fire stopping material and installation must not distort duct.

2.7 GALVANIZED STEEL

.1 Lock forming quality: to ASTM A653/A653M, Z90 zinc coating.

.2 Thickness, fabrication and reinforcement: to SMACNA.

.3 Joints: to SMACNA.

2.8 STAINLESS STEEL

.1 To ASTM A480/A480M, Type 304.

.2 Finish: number 4.

.3 Thickness, fabrication and reinforcement: to SMACNA.

.4 Joints: to SMACNA.

2.9 ALUMINUM

.1 To SMACNA. Aluminum type: 3003-H-14.

.2 Thickness, fabrication and reinforcement: to SMACNA.

.3 Joints: to SMACNA.

2.10 BLACK STEEL

.1 To ASTM A635/A635M.

.2 Thickness: 1.2 mm or as indicated.

.3 Fabrication: ducts and fittings to SMACNA.

.4 Joints: continuous weld.

2.11 KITCHEN EXHAUST SYSTEMS

.1 Construct in accordance with NFPA 96.

.2 Material: black steel sheet.

2.12 HANGERS AND SUPPORTS

.1 Hangers and Supports: in accordance with Section 23 05 29- Hangers and Supports for HVAC Piping and Equipment.

.1 Strap hangers: of same material as duct but next sheet metal thickness heavier than duct.

.1 Maximum size duct supported by strap hanger: 500.

.2 Hanger configuration: to SMACNA.

.3 Hangers: galvanized steel angle with galvanized steel rods to following table SMACNA:

Duct Size (mm)	Angle Size (mm)	Rod Size (mm)
up to 750	25 x 25 x 3	6
751 to 1050	40 x 40 x 3	6
1051 to 1500	40 x 40 x 3	10
1501 to 2100	50 x 50 x 3	10
2101 to 2400	50 x 50 x 5	10
2401 and over	50 x 50 x 6	10

.4 Upper hanger attachments:

.1 For concrete: manufactured concrete inserts.

.2 For steel joist: manufactured joist clamp.

.3 For steel beams: manufactured beam clamps:

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 metal duct 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 GENERAL

.1 Do work SMACNA.

.2 Do not break continuity of insulation vapour barrier with hangers or rods.

.1 Ensure diffuser is fully seated.

.3 Support risers SMACNA.

.4 Install breakaway joints in ductwork on sides of fire separation.

.5 Install proprietary manufactured flanged duct joints in accordance with manufacturer's instructions.

.6 Manufacture duct in lengths and diameter to accommodate installation of acoustic duct lining.

3.3 HANGERS

.1 Strap hangers: install in accordance with SMACNA.

.2 Angle hangers: complete with locking nuts and washers.

.3 Hanger spacing: as follows:

Duct Size	Spacing
(mm)	(mm)
to 1500	3000
1501 and over	2500

3.4 WATERTIGHT DUCT

.1 Provide watertight duct for:

.1 Dishwasher exhaust.

.2 Fresh air intake.

.3 Minimum 3000 mm from duct mounted humidifier in all directions.

.4 As indicated.

.2 Form bottom of horizontal duct without longitudinal seams.

.1 Weld joints of bottom and side sheets.

.2 Seal other joints with duct sealer.

.3 Fit base of riser with 150 mm deep drain sump and 32 mm drain connected, with deep seal trap and trap primer and discharging as indicated.

3.5 SEALING AND TAPING

.1 Apply sealant in accordance with to manufacturer's recommendations and SMACNA.

.2 Bed tape in sealant and recoat with minimum of 1 coat of sealant to manufacturers recommendations.

END OF SECTION

Part 1 General

1.1 REFERENCE STANDARDS

.1 Sheet Metal and Air Conditioning Contractors' National Association (SMACNA)

.1 SMACNA - HVAC Duct Construction Standards - Metal and Flexible.

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 air duct accessories and include product characteristics, performance criteria, physical size, finish and limitations.

.2 Indicate:

.1 Flexible connections.

.2 Duct access doors.

.3 Turning vanes.

.4 Instrument test ports.

1.3 DELIVERY, STORAGE AND HANDLING

.1 Deliver, store and handle materials in accordance with Section 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 and protect air duct accessories from nicks, scratches, and blemishes.

.2 Replace defective or damaged materials with new.

Part 2 Products

2.1 GENERAL

.1 Manufacture in accordance with SMACNA - HVAC Duct Construction Standards.

2.2 FLEXIBLE CONNECTIONS

.1 Frame: galvanized sheet metal frame

.2 Material:

.1 Fire resistant, self extinguishing, neoprene coated glass fabric, temperature rated at minus 40 degrees C to plus 90 degrees C, density of 1.3 kg/m^2.

2.3 ACCESS DOORS IN DUCTS

.1 Non-Insulated Ducts: sandwich construction of same material as duct, one sheet metal thickness heavier, minimum 0.6 mm thick complete with sheet metal angle frame.

.2 Insulated Ducts: sandwich construction of same material as duct, one sheet metal thickness heavier, minimum 0.6 mm thick complete with sheet metal angle frame and 25 mm thick rigid glass fibre insulation.

.3 Gaskets: neoprene.

.4 Hardware:

.1 Up to 300 x 300 mm: two sash locks complete with safety chain.

.2 301 to 450 mm: four sash locks complete with safety chain.

.3 451 to 1000 mm: piano hinge and minimum two sash locks.

.4 Doors over 1000 mm: piano hinge and two handles operable from both sides.

.1 Hold open devices.

.2 300 x 300 mm glass viewing panels.

2.4 TURNING VANES

.1 Factory or shop fabricated single thickness with trailing edge, to recommendations of SMACNA and as indicated.

2.5 INSTRUMENT TEST

.1 1.6 mm thick steel zinc plated after manufacture.

.2 Cam lock handles with neoprene expansion plug and handle chain.

.3 28 mm minimum inside diameter. Length to suit insulation thickness.

.4 Neoprene mounting gasket.

2.6 SPIN-IN COLLARS (NOT PERMITTED)

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 air duct accessories 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 INSTALLATION

.1 Flexible Connections:

.1 Install in following locations or as indicated:
  .1 Inlets and outlets to supply air units and fans.
  .2 Inlets and outlets of exhaust and return air fans.
.2 Length of connection: 100 mm.
.3 Minimum distance between metal parts when system in operation: 75 mm.
.4 Install in accordance with recommendations of SMACNA.
.5 When fan is running:
  .1 Ducting on sides of flexible connection to be in alignment.
  .2 Ensure slack material in flexible connection.

.2 Access Doors and Viewing Panels:

.1 Locations:
  .1 Fire and smoke dampers.
  .2 Control dampers.
  .3 Devices requiring maintenance.
  .4 Required by code.
  .5 Reheat coils.
  .6 Elsewhere as indicated.

.3 Instrument Test Ports:

.1 General:
  .1 Install in accordance with recommendations of SMACNA and in accordance with manufacturer's instructions.
.2 Locate to permit easy manipulation of instruments.
.3 Install insulation port extensions as required.
.4 Locations as indicated and:
  .1 For traverse readings:
    .1 Ducted inlets to roof and wall exhausters.
    .2 Inlets and outlets of other fan systems.
    .3 Main and sub-main ducts.
  .2 For temperature readings:
    .1 At outside air intakes.
    .2 In mixed air applications in locations as approved by Consultant.
    .3 At inlet and outlet of coils.

.4 Turning Vanes:

.1 Install in accordance with recommendations of SMACNA and as indicated.

END OF SECTION

Part 1 General

1.1 REFERENCE STANDARDS

.1 Sheet Metal and Air Conditioning National Association (SMACNA)

.1 SMACNA HVAC Duct Construction Standards, Metal and Flexible.

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 dampers and include product characteristics, performance criteria, physical size, finish and limitations.

1.3 DELIVERY, STORAGE AND HANDLING

.1 Delivery and Acceptance Requirements: deliver materials to site in original factory packaging, labelled with manufacturer's name and address.

.2 Storage and Handling Requirements:

.1 Store materials in accordance with manufacturer's recommendations in clean, dry, well-ventilated area.

.2 Store and protect dampers from nicks, scratches, and blemishes.

Part 2 Products

2.1 GENERAL

.1 Manufacture to SMACNA standards.

2.2 SPLITTER DAMPERS

.1 Fabricate from same material as duct but one sheet metal thickness heavier, with appropriate stiffening.

.2 Double thickness construction.

.3 Control rod with locking device and position indicator.

.4 Rod configuration to prevent end from entering duct.

.5 Pivot: piano hinge.

.6 Folded leading edge.

2.3 SINGLE BLADE DAMPERS

.1 Fabricate from same material as duct, but one sheet metal thickness heavier. V-groove stiffened.

.2 Size and configuration to recommendations of SMACNA, except maximum height of 100 mm.

.3 Locking quadrant with shaft extension to accommodate insulation thickness.

.4 Inside and outside nylon end bearings.

.5 Channel frame of same material as adjacent duct, complete with angle stop.

2.4 MULTI-BLADED DAMPERS

.1 Factory manufactured of material compatible with duct.

.2 Opposed blade: configuration, metal thickness and construction to recommendations of SMACNA.

.3 Maximum blade height: 100 mm.

.4 Bearings: self-lubricating nylon.

.5 Linkage: shaft extension with locking quadrant.

.6 Channel frame of same material as adjacent duct, complete with angle stop.

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 damper installation in accordance with manufacturer's written instructions.

.1 Visually inspect substrate

.2 Proceed with installation only after unacceptable conditions have been remedied and after receipt of written approval to proceed Consultant.

3.2 INSTALLATION

.1 Install where indicated.

.2 Install in accordance with recommendations of SMACNA and in accordance with manufacturer's instructions.

.3 Locate balancing dampers in each branch duct, for supply, return and exhaust systems.

.4 Runouts to registers and diffusers: install single blade damper located as close as possible to main ducts.

.5 Dampers: vibration free.

.6 Ensure damper operators are observable and accessible.

.7 Corrections and adjustments conducted by Consultant.

END OF SECTION

Part 1 General

1.1 RELATED REQUIREMENTS

1.2 REFERENCE STANDARDS

.1 National Fire Protection Association (NFPA)

.1 NFPA 90A, Standard for the Installation of Air Conditioning and Ventilating Systems.

.2 Underwriters Laboratories of Canada (ULC)

.1 CAN/ULC-S112, Standard Test Method of Fire Test of Fire Damper Assemblies.

.2 CAN/ULC-S112.2, Standard Method of Fire Test of Ceiling Fire Stop Flap Assemblies.

.3 ULC-S505, Standard for Fusible Links for Fire Protection Service.

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 fire and smoke dampers and include product characteristics, performance criteria, physical size, finish and limitations.

1.4 CLOSEOUT SUBMITTALS

.1 Submit in accordance with Section 01 78 00- Closeout Submittals.

.2 Operation and Maintenance Data: submit operation and maintenance data for fire and smoke dampers for incorporation into manual.

1.5 MAINTENANCE MATERIAL SUBMITTALS

.1 Extra Materials:

.1 Submit maintenance materials in accordance with Section 01 78 00- Closeout Submittals.

.2 Provide:

.1 6 fusible links of each type.

1.6 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 and in accordance with manufacturer's recommendations in clean, dry, well-ventilated area.

.2 Store and protect fire and smoke dampers from nicks, scratches, and blemishes.

.3 Replace defective or damaged materials with new.

Part 2 Products

2.1 FIRE DAMPERS

.1 Dynamic Fire dampers: arrangement Type B, listed bear label of ULC, meet requirements of authorities having jurisdiction and NFPA 90A. Fire damper assemblies fire tested in accordance with CAN/ULC-S112.

.2 Mild steel, factory fabricated for fire rating requirement to maintain integrity of fire wall and/or fire separation.

.1 Fire dampers: 1-1/2 hour fire rated unless otherwise indicated.

.2 Fire dampers: automatic operating type and have dynamic rating suitable for maximum air velocity and pressure differential to which it will be subjected.

.3 Top hinged: offset single damper , round or square; multi-blade hinged sized to maintain full duct cross section as indicated.

.4 Fusible link actuated, weighted to close and lock in closed position when released or having negator-spring-closing operator for multi-leaf type or roll door type in horizontal position with vertical air flow.

.5 40 x 40 x 3 mm retaining angle iron frame, on full perimeter of fire damper, on both sides of fire separation being pierced.

.6 Equip fire dampers with steel sleeve or frame installed disruption ductwork or impair damper operation.

.7 Equip sleeves or frames with perimeter mounting angles attached on both sides of wall or floor opening. Construct ductwork in fire-rated floor-ceiling or roof-ceiling assembly systems with air ducts that pierce ceiling to conform with ULC.

.8 Design and construct dampers to not reduce duct or air transfer opening cross-sectional area.

.9 Dampers shall be installed so that the centerline of the damper depth or thickness is located in the centerline of the wall, partition of floor slab depth or thickness.

.10 Unless otherwise indicated, the installation details given in SMACNA Install Fire Damp HVAC and in manufacturer's instructions for fire dampers shall be followed.

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 fire and smoke damper 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 INSTALLATION

.1 Install in accordance with NFPA 90A and in accordance with conditions of ULC listing.

.2 Maintain integrity of fire separation.

.3 After completion and prior to concealment obtain approvals of complete installation from authority having jurisdiction.

.4 Install access door adjacent to each damper

.5 Co-ordinate with installer of fire stopping.

.6 Ensure access doors/panels, fusible links, damper operators are easily observed and accessible.

.7 Install break-away joints of approved design on each side of fire separation.

END OF SECTION

Part 1 General

1.1 REFERENCE STANDARDS

.1 American Society of Heating, Refrigerating and Air-Conditioning Engineers, Inc. (ASHRAE)

.2 National Fire Protection Association (NFPA)

.1 NFPA 90A, Standard for the Installation of Air-Conditioning and Ventilating Systems.

.2 NFPA 90B, Standard for Installation of Warm Air Heating and Air-Conditioning Systems.

.3 Sheet Metal and Air-Conditioning Contractors' National Association (SMACNA)

.1 SMACNA HVAC Duct Construction Standards - Metal and Flexible.

.2 SMACNA IAQ Guideline for Occupied Buildings under Construction.

.4 Underwriters' Laboratories (UL)

.1 UL 181, Standard for Factory-Made Air Ducts and Air Connectors.

.5 Underwriters' Laboratories of Canada (ULC)

.1 CAN/ULC-S110, Standard Methods of Tests for Air Ducts.

1.2 ACTION AND INFORMATIONAL SUBMITTALS

.1 Submit in accordance with Section 01 33 00- Submittal Procedures.

1.3 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 in clean, dry, well-ventilated area.

.2 Store and protect flexible ducts from nicks, scratches, and blemishes.

.3 Replace defective or damaged materials with new.

Part 2 Products

2.1 GENERAL

.1 Factory fabricated to CAN/ULC-S110.

.2 Pressure drop coefficients listed below are based on relative sheet metal duct pressure drop coefficient of 1.00.

.3 Flame spread rating not to exceed 25. Smoke developed rating not to exceed 50.

2.2 METALLIC - UNINSULATED

.1 Type 1: spiral wound flexible aluminum, as indicated.

.2 Performance:

.1 Factory tested to 2.5 kPa without leakage.

.2 Maximum relative pressure drop coefficient: 3.

2.3 METALLIC - INSULATED

.1 Type 2: spiral wound flexible aluminum with factory applied, 37 mm thick flexible glass fibre thermal insulation with vapour barrier and vinyl jacket, as indicated.

.2 Performance:

.1 Factory tested to 2.5 kPa without leakage.

.2 Maximum relative pressure drop coefficient: 3.

2.4 NON-METALLIC – UNINSULATED

.1 Type 3: non-collapsible, coated mineral base fabric type, mechanically bonded to, and helically supported by, external steel wire, as indicated.

.2 Performance:

.1 Factory tested to 2.5 kPa without leakage.

.2 Maximum relative pressure drop coefficient: 3.

2.5 NON-METALLIC - INSULATED

.1 Type 4: non-collapsible, coated mineral base fabric type mechanically bonded to, and helically supported by, external steel wire with factory applied, 37 mm thick flexible mineral fibre thermal insulation with vapour barrier and vinyl jacket, as indicated.

.2 Performance:

.1 Factory tested to 2.5 kPa without leakage.

.2 Maximum relative pressure drop coefficient: 3.

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 flexible ducts 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 DUCT INSTALLATION

.1 Install in accordance with: SMACNA.

END OF SECTION

Part 1 General

1.1 REFERENCE STANDARDS

.1 American National Standards Institute/Air Movement and Control Association (ANSI/AMCA)

- .1 AMCA Publication 201, Fans and Systems.
- .2 ANSI/ASHRAE 51 (ANSI/AMCA 210), Laboratory Methods of Testing Fans for Aerodynamic Performance Rating.
- .3 ANSI/AMCA Standard 300, Reverberant Room Method for Sound Testing of Fans.
- .4 ANSI/AMCA Standard 301, Methods for Calculating Fan Sound Ratings from Laboratory Test Data.
- .5 AMCA Publication 302 Application of Sone Ratings for Non-Ducted Air Moving Devices.
- .6 AMCA Publication 303, Application of Sound Power Level Ratings for Fans.

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 domestic fans and include product characteristics, performance criteria, physical size, finish and limitations.

1.3 MAINTENANCE MATERIAL SUBMITTALS

.1 Extra Materials:

- .1 Submit in accordance with Section 01 78 00- Closeout Submittals.
- .2 Furnish list of individual manufacturer's recommended spare parts for equipment, include:
  - .1 Bearings and seals.
  - .2 Addresses of suppliers.
  - .3 List of specialized tools necessary for adjusting, repairing or replacing.

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 in clean, dry, well-ventilated area.

.2 Store and protect domestic fans from nicks, scratches, and blemishes.

.3 Replace defective or damaged materials with new.

Part 2 Products

2.1 FANS - GENERAL

.1 Kitchenette Exhaust Fan (EF-1)

.1 Capacity: 35 L/s (75 CFM) at 125 Pa (0.5 IN WG)

.2 Configuration: Ceiling bottom inlet grille and side outlet connection for 152 mm diameter duct, as indicated on Drawings.

.3 Housing: 20 Ga, 1.0 mm galvanized steel.

.4 Blower Wheel: Single wheel, impact resistant polymeric construction.

.5 Inlet Grille: White polymeric

.6 Integral gravity backdraft damper.

.7 13 mm acoustic insulation lining.

.8 Suitable for ceiling

.9 Provided with vibration isolation hanger

.10 Wall Caps: Round Inlet Duct: Provide mill finish aluminum weatherproof outlet, suitable for wall mount, with integral backdraft damper and with integral bird screen.

.11 Standard of Acceptance

.1 Twin City Fans Model T-100 or approved equal

.2 Standard of rating:

.1 AMCA Publication 201 for fan application.

.2 AMCA Publication 302 for application of sone loudness ratings for non-ducted air moving devices.

.3 AMCA Publication 303 for application of sound power ratings for ducted air moving devices.

.4 Performance: to ANSI/AMCA Standard 210. Unit to bear ANSI/AMCA certified seal .

.3 Sound level ratings to comply with ANSI/AMCA Standard 301, tested to ANSI/AMCA Standard 300 Unit to bear ANSI/AMCA certified sound rating seal.

.4 Maximum loudness: 5 sones.

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 domestic fan installation in accordance with manufacturer's written instructions.

.1 Visually inspect substrate

.2 Inform Consultant unacceptable conditions immediately upon discovery.

.3 Proceed with installation only after unacceptable conditions have been remedied.

3.2 INSTALLATION

.1 Install in accordance with manufacturer's recommendations.

END OF SECTION

Part 1 General

1.1 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 diffusers, registers and grilles and include product characteristics, performance criteria, physical size, finish and limitations.

.2 Indicate following:

.1 Capacity.

.2 Throw and terminal velocity.

.3 Noise criteria.

.4 Pressure drop.

.5 Neck velocity.

1.2 MAINTENANCE MATERIAL SUBMITTALS

.1 Extra Materials:

.1 Provide maintenance materials in accordance with Section 01 78 00- Closeout Submittals.

1.3 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 and in accordance with manufacturer's recommendations in clean, dry, well-ventilated area.

.2 Store and protect diffuser, registers and grilles from nicks, scratches, and blemishes.

.3 Replace defective or damaged materials with new.

Part 2 Products

2.1 SYSTEM DESCRIPTION

.1 Performance Requirements:

.1 Catalogued or published ratings for manufactured items: obtained from tests carried out by manufacturer or those ordered by manufacturer from independent testing agency signifying adherence to codes and standards.

2.2 GENERAL

.1 To meet capacity, pressure drop, terminal velocity, throw, noise level, neck velocity as indicated.

.2 Frames:

.1 Full perimeter gaskets.

.2 Plaster frames where set into plaster or gypsum board and as specified.

.3 Concealed fasteners.

.3 Concealed manual volume control damper operators.

.4 Colour: as specified.

2.3 MANUFACTURED UNITS

.1 Grilles, registers and diffusers of same generic type, products of one manufacturer.

2.4 SUPPLY GRILLES AND REGISTERS

.1 Type S-1

.1 Architectural square panel ceiling diffusers 610mm x 610mm with 254mm round duct connection.

.2 The diffuser shall have an 22-gauge steel face panel that captures a secondary 22-gauge panel. The face panel is removable by means of four hanger brackets. The exposed surface of the face panel shall be smooth, flat, and free of visible fasteners.

.3 The face panel shall project 6mm below the outside border of the diffuser backpan. Panels projecting more than 6mm below the outside border are not acceptable. The back of the face panel shall have an aerodynamically shaped, rolled edge to ensure a tight horizontal discharge pattern. A single metal thickness on the edges of the face panel will not be accepted. Ceiling diffusers with a 610mm x 610mm full face shall have no less than an 457mm x 457mm face panel size.

.4 The backpan shall be one piece precision die-stamped and shall include an integrally drawn inlet (welded-in inlets and corner joints are not acceptable). The diffuser backpan shall be constructed of 22-gauge steel. The diffuser neck shall have a minimum of 32mm depth available for duct connection.

.5 The finish shall be white. The finish shall be an anodic acrylic paint, baked at 155° C for 30 minutes. The pencil hardness must be HB to H. The paint must pass a 100-hour ASTM B117 Corrosive Environments Salt Spray Test without creepage, blistering or deterioration of film. The paint must pass a 250-hour ASTM D870 Water Immersion Test. The paint must also pass the ASTM D2794 Reverse Impact Cracking Test.

.6 Molded insulation blanket shall be included. The insulation shall be R-6, foil-backed, and provide an additional 25mm gap around the neck to install insulated flex duct.

.7 The manufacturer shall provide published performance data for the square panel diffuser. The diffuser shall be tested in accordance with ANSI/ASHRAE Standard 70-1991.

.8 Provide frame suitable for ceiling type

.9 Standard of Acceptance

.1 Titus Model OMNI, or approved equal.

2.5 RETURN AND EXHAUST GRILLES AND REGISTERS

.1 Type R-1

.1 610mm x 610mm Return Panel, Flush Face, with 300mm X 300mm neck

.2 Perforated ceiling panels for return applications. Perforated face panels shall have 5mm diameter holes on 6mm staggered centers and no less than 51 percent free area.

.3 The finish shall be white. The finish shall be an anodic acrylic paint, baked at 155° C for 30 minutes. The pencil hardness must be HB to H. The paint must pass a 100-hour ASTM B117 Corrosive Environments Salt Spray Test without creepage, blistering or deterioration of film. The paint must pass a 250-hour ASTM D870 Water Immersion Test. The paint must also pass the ASTM D2794 Reverse Impact Cracking Test.

.4 The manufacturer shall provide published performance data for the perforated return panels. The panels shall be tested in accordance with ANSI/ASHRAE Standard 70-1991.

.5 Provide frame suitable for ceiling type

.6 Standard of Acceptance

.1 Titus Model PAR, or approved equal.

.2 Type E-1

.1 Exhaust Panel, Size to Match Existing (To be confirmed by contractor)

.2 Perforated ceiling panels for return applications. Perforated face panels shall have 5mm diameter holes on 6mm staggered centers and no less than 51 percent free area.

.3 The finish shall be white. The finish shall be an anodic acrylic paint, baked at 155° C for 30 minutes. The pencil hardness must be HB to H. The paint must pass a 100-hour ASTM B117 Corrosive Environments Salt Spray Test without creepage, blistering or deterioration of film. The paint must pass a 250-hour ASTM D870 Water Immersion Test. The paint must also pass the ASTM D2794 Reverse Impact Cracking Test.

.4 The manufacturer shall provide published performance data for the perforated return panels. The panels shall be tested in accordance with ANSI/ASHRAE Standard 70-1991.

.5 Standard of Acceptance

.1 Titus Model 8F, or approved equal.

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 diffuser, register and grille 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 INSTALLATION

.1 Install in accordance with manufacturers instructions.

.2 Install with stainless steel screws in countersunk holes where fastenings are visible.

.3 Bolt grilles, registers and diffusers, in place, in gymnasium and similar game rooms.

.4 Provide concealed safety chain on each grille, register and diffuser in gymnasium and similar game rooms and elsewhere as indicated.

END OF SECTION

Part 1 Products

1.1 BASEBOARD CONVECTORS

.1 Heaters:

- .1 22-gauge steel casing able to support 75 kg (165 lb) at its centre
- .2 Full-length thermal protection with automatic reset
- .3 Cabinet designed to ensure optimal hot air distribution

.2 Element: single tubular, stainless steel sheathed element with boxed aluminum fins for improved heat dissipation; the element is securely fastened at its centre, floating in nylon sleeves at each end, eliminating expansion and contraction noises.

.3 Colour: White

.4 Finish: Epoxy-polyester powder coat

1.2 CONTROLS

.1 Built-in thermostat installed in the left or right junction box

.2 Single pole electronic thermostat installed in the left or right junction box

.3 Low voltage (24VDC) relay kit

.4 Wall mounted thermostats: electronic type complete with

- .1 Separate programming for the weekdays and weekend with 4 periods per day
- .2 Easy to read backlit display
- .3 Energy saving with personalized temperature control
- .4 Accurate temperature control of +/- 0.5 degrees Fahrenheit to set-point.
- .5 High capacity, up to 3,500 watts at 240 volts. .

Part 2 Execution

2.1 INSTALLATION

.1 Install baseboard convector heaters, blank sections and controls.

.2 When wireway is used, remove knock-outs and insert insulating bushing between units.

.3 Install grounding wire to maintain ground integrity between heating, blank, and auxiliary sections.

.4 Install thermostats in locations indicated.

.5 Make power and control connections.

END OF SECTION

Part 1 General

1.1 REFERENCE STANDARDS

Contractor to follow the latest versions of the following:

.1 CSA Group

- .1 CSA C22.1 , Canadian Electrical Code, Part 1 (22nd Edition), Safety Standard for Electrical Installations.
- .2 CSA C22.2 No.
- .3 CAN/CSA-C22.3 No.1 , Overhead Systems.
- .4 CAN3-C235-83(R2010) , Preferred Voltage Levels for AC Systems, 0 to 50,000 V.

.2 Institute of Electrical and Electronics (IEEE)/National Electrical Safety Code Product Line (NESC)

- .1 IEEE SP1122, The Authoritative Dictionary of IEEE Standards Terms, 7th Edition.

1.2 DEFINITIONS

.1 Electrical and electronic terms: unless otherwise specified or indicated, terms used in these specifications, and on drawings, are those defined by IEEE SP1122.

1.3 ACTION AND INFORMATIONAL SUBMITTALS

.1 Submit in accordance with Section 01 33 00- Submittal Procedures .

.2 Certificates:

- .1 Provide CSA & ULC certified .
- .2 Submit test results of installed electrical systems and instrumentation.
- .3 Permits and fees: in accordance with General Conditions of contract.
- .4 Submit, upon completion of Work, load balance report as described in PART 3 - LOAD BALANCE.

.3 Sustainable Design Submittals:

- .1 Construction Waste Management:
  - .1 Submit project Waste Management Plan highlighting recycling and salvage requirements.
  - .2 Submit calculations on end-of-project recycling rates, salvage rates, and landfill rates demonstrating that 75 % of construction wastes were recycled or salvaged.
- .2 Building Energy and Water Consumption: submit Measurement and Verification Plan following IPMVP:
  - .1 Lighting systems and controls.

.2 Constant and variable motor loads.

.3 Variable frequency drive (VFD) operation.

.4 Chiller efficiency at variable loads (kW/ton).

.5 Cooling load.

.6 Air and water economizer and heat recovery cycle.

.7 Air distribution static pressures and ventilation air volumes.

.8 Boiler efficiencies.

.9 Building-related process energy systems and equipment.

.10 Indoor water risers and outdoor irrigation systems.

.3 Recycled Content:

.1 Submit listing of recycled content products used, including details of required percentages or recycled content materials and products, showing their costs and percentages of post-consumer content, and total cost of materials for project.

1.4 CLOSEOUT SUBMITTALS

.1 Submit in accordance with Section 01 78 00- Closeout Submittals.

.2 Operation and Maintenance Data: submit operation and maintenance data for:

.1 Provide for each system and principal item of equipment as specified in technical sections for use by operation and maintenance personnel.

.2 Operating instructions to include following:

.1 Wiring diagrams, control diagrams, and control sequence for each principal system and item of equipment.

.2 Start up, proper adjustment, operating, lubrication, and shutdown procedures.

.3 Safety precautions.

.4 Procedures to be followed in event of equipment failure.

.5 Other items of instruction as recommended by manufacturer of each system or item of equipment.

.3 Print or engrave operating instructions and frame under glass or in approved laminated plastic.

.4 Post instructions where directed.

.5 For operating instructions exposed to weather, provide weather-resistant materials or weatherproof enclosures.

.6 Ensure operating instructions will not fade when exposed to sunlight and are secured to prevent easy removal or peeling.

1.5 DELIVERY, STORAGE AND HANDLING

.1 Deliver, store and handle materials in accordance with Section with manufacturer's written instructions and 01 61 00- Common Product Requirements.

.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 and in accordance with manufacturer's recommendations in clean, dry, well-ventilated area.

.2 Store and protect against nicks, scratches, and blemishes

.3 Replace defective or damaged materials with new.

Part 2 Products

2.1 DESIGN REQUIREMENTS

.1 Operating voltages: to CAN3-C235.

.2 Motors, electric heating, control and distribution devices and equipment to operate satisfactorily at 60 Hz within normal operating limits established by above standard.

.1 Equipment to operate in extreme operating conditions established in above standard without damage to equipment.

.3 Language operating requirements: provide identification labels & nameplates for control items in English.

.4 Use one nameplate label for each language.

2.2 MATERIALS AND EQUIPMENT

.1 Provide material and equipment in accordance with Section 01 61 00- Common Product Requirements.

.2 Material to be CSA certified. Where CSA certified equipment material is not available, obtain special approval from inspection authorities before delivery to site and submit such approval as described in PART 1 - ACTION AND INFORMATIONAL SUBMITTALS.

.3 Factory assemble control panels and component assemblies.

2.3 ELECTRIC MOTORS, EQUIPMENT AND CONTROLS

.1 Verify installation and co-ordination responsibilities related to motors, equipment and controls, as indicated.

2.4 WIRING TERMINATIONS

.1 Ensure lugs, terminals, screws used for termination of wiring are suitable for either copper or aluminum conductors.

2.5 EQUIPMENT IDENTIFICATION

.1 Identify electrical equipment with nameplates as follows:

.1 Nameplates: lamicoid 3mm, with mechanically attached with self tapping screws.

.2 Sizes as follows:

NAMEPLATE SIZES			
Size 1	10 x 50 mm	1 line	3 mm high letters
Size 2	12 x 70 mm	1 line	5 mm high letters
Size 3	12 x 70 mm	2 lines	3 mm high letters
Size 4	20 x 90 mm	1 line	8 mm high letters
Size 5	20 x 90 mm	2 lines	5 mm high letters
Size 6	25 x 100 mm	1 line	12 mm high letters
Size 7	25 x 100 mm	2 lines	6 mm high letters

.2 Labels: embossed plastic labels with 6 mm high letters unless specified otherwise.

.3 Wording on labels to be approved by owners engineer.

.4 Disconnects, starters and contactors: indicate equipment being controlled and voltage.

.5 Terminal cabinets and pull boxes: indicate system and voltage.

.6 Transformers: indicate capacity, primary and secondary voltages.

2.6 WIRING IDENTIFICATION

.1 Identify wiring with permanent indelible identifying markings, on both ends of phase conductors of feeders and branch circuit wiring.

.2 Maintain phase sequence and colour coding throughout.

.3 Colour coding: to CSA C22.1.

.4 Use colour coded wires in communication cables, matched throughout system.

2.7 CONDUIT AND CABLE IDENTIFICATION

.1 Colour code conduits, boxes and metallic sheathed cables.

.2 Code with plastic tape or paint at points where conduit or cable enters wall, ceiling, or floor, and at 10 m intervals.

.3 Colours: 25 mm wide prime colour and 20 mm wide auxiliary colour.

Type	Prime	Auxiliary
up to 250 V	Yellow	
up to 600 V	Yellow	Green
up to 5 kV	Yellow	Blue
up to 15 kV	Yellow	Red
Telephone	Green	
Other Communication Systems	Green	Blue
Fire Alarm	Red	
Emergency Voice	Red	Blue
Other Security Systems	Red	Yellow

2.8 FINISHES

.1 Shop finish metal enclosure surfaces by application of rust resistant primer inside and outside, and at least two coats of finish enamel.

Part 3 Execution

3.1 EXAMINATION

.1 The contractor is to verify the existing site conditions. No extras will be approved due to failure of sire examination prior to bid.

3.2 INSTALLATION

.1 Do complete installation in accordance with CSA C22.1 except where specified otherwise.

.2 Do overhead and underground systems in accordance with CAN/CSA-C22.3 No.1 except where specified otherwise.

3.3 NAMEPLATES AND LABELS

.1 Ensure manufacturer's nameplates, CSA labels and identification nameplates are visible and legible after equipment is installed.

3.4 CONDUIT AND CABLE INSTALLATION

.1 Install conduit and sleeves prior to pouring of concrete.

.2 If plastic sleeves are used in fire rated walls or floors, remove before conduit installation.

.3 Install cables, conduits and fittings embedded or plastered over, close to building structure so furring can be kept to minimum.

3.5 LOCATION OF OUTLETS

.1 Locate outlets in accordance with Section 26 05 32- Outlet Boxes, Conduit Boxes and Fittings.

.2 Do not install outlets back-to-back in wall; allow minimum 150 mm horizontal clearance between boxes.

.3 Change location of outlets at no extra cost or credit, providing distance does not exceed 3000 mm, and information is given before installation.

.4 Locate light switches on latch side of doors.

.1 Locate disconnect devices in mechanical and elevator machine rooms on latch side of floor.

3.6 MOUNTING HEIGHTS

.1 Mounting height of equipment is from finished floor to centreline of equipment unless specified or indicated otherwise.

.2 If mounting height of equipment is not specified or indicated, verify before proceeding with installation.

.3 Install electrical equipment at following heights unless indicated otherwise.

.1 Local switches: 1400 mm.

.2 Wall receptacles:

.1 General: 300mm.

.2 Above top of continuous baseboard heater: 200 mm.

.3 Above top of counters or counter splash backs: 175 mm.

.4 In mechanical rooms: 1400 mm.

.3 Panelboards: as required by Code or as indicated.

.4 Telephone and interphone outlets: 300 mm.

.5 Wall mounted telephone and interphone outlets:1500 mm.

.6 Fire alarm stations: 1500 mm.

.7 Door bell pushbuttons: 1500 mm.

3.7 CO-ORDINATION OF PROTECTIVE DEVICES

.1 Ensure circuit protective devices such as overcurrent trips, relays and fuses are installed to required values and settings.

3.8 FIELD QUALITY CONTROL

.1 Load Balance:

.1 Measure phase current to panelboards with normal loads (lighting) operating at time of acceptance; adjust branch circuit connections as required to obtain best balance of current between phases and record changes.

.2 Measure phase voltages at loads and adjust transformer taps to within 2% of rated voltage of equipment.

.3 Provide upon completion of work, load balance report as directed in PART 1 - ACTION AND INFORMATIONAL SUBMITTALS, phase and neutral currents on panelboards, dry-core transformers and motor control centres, operating under normal load, as well as hour and date on which each load was measured, and voltage at time of test.

.2 Conduct following tests in accordance with Section 01 45 00- Quality Control.

.1 Power system including phasing, voltage, grounding and load balancing.

.2 Circuits originating from branch distribution panels.

.3 Lighting and its control.

.4 Motors, heaters and associated control equipment including sequenced operation of systems where applicable.

.5 Insulation resistance testing:

.1 Megger circuits, feeders and equipment up to 350 V with a 500 V instrument.

.2 Megger 350-600 V circuits, feeders and equipment with a 1000 V instrument.

.3 Check resistance to ground before energizing.

.3 Provide instruments, meters, equipment and personnel required to conduct tests during and at conclusion of project.

.4 Manufacturer's Field Services:

.1 Obtain written report from manufacturer verifying compliance of Work, in handling, installing, applying, protecting and cleaning of product and submit Manufacturer's Field Reports as described in PART 1 - ACTION AND INFORMATIONAL SUBMITTALS.

.2 Provide manufacturer's field services consisting of product use recommendations and periodic site visits for inspection of product installation in accordance with manufacturer's instructions.

3.9 SYSTEM STARTUP

.1 Arrange and pay for services of manufacturer's factory service engineer to supervise start-up of installation, check, adjust, balance and calibrate components and instruct operating personnel.

.2 Provide these services for such period, and for as many visits as necessary to put equipment in operation, and ensure that operating personnel are conversant with aspects of its care and operation.

3.10 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 Waste Management:

.1 Remove recycling containers and bins from site and dispose of materials at appropriate facility.

END OF SECTION

Part 1 General

1.1 SUMMARY

.1 This Section includes requirements for selective demolition and removal of electrical safety and security, communications components including removal of conduit, junction boxes, and panels to source (home run removal) and incidentals required to complete work described in this Section ready for new construction.

1.2 RELATED REQUIREMENTS

.1 Section 02 41 19.16– Selective Interior Demolition

.2 Section 02 42 00– Removal and Salvage of Construction Materials

1.3 REFERENCE STANDARDS

.1 Canadian Standards Association (CSA)

.1 CSA S350 M1980 (Latest Applicable Edition), Code of Practice for Safety in Demolition of Structures.

1.4 DEFINITIONS

.1 Demolish: Detach items from existing construction and legally dispose of items off site, unless indicated as removed and salvaged, or removed and reinstalled.

.2 Remove: Planned deconstruction and disassembly of electrical items from existing construction including removal of conduit, junction boxes , cabling and wiring from electrical component to panel taking care not to damage adjacent assemblies designated to remain; legally dispose of items off site, unless indicated as removed and salvaged, or removed and reinstalled.

.3 Remove and Salvage: Detach items from existing construction and deliver them to owner ready for reuse.

.4 Remove and Reinstall: Detach items from existing construction, prepare them for reuse, and reinstall them where indicated.

.5 Existing to Remain: Existing items of construction that are not removed and that are not otherwise indicated as being removed and salvaged, or removed and reinstalled.

.6 Hazardous Substances: Dangerous substances, dangerous goods, hazardous commodities and hazardous products may include asbestos, mercury and lead, PCB's, poisons, corrosive agents, flammable substances, radioactive substances, or other material that can endanger human health or wellbeing or environment if handled improperly as defined by Federal Hazardous Products Act (RSC 1985) including latest amendments.

1.5 ACTION AND INFORMATIONAL SUBMITTALS

.1 Action Submittals: Provide in accordance with Section 01 33 00– Submittal Procedures before starting work of this Section:

.1 Construction Waste Management Plan (CWM Plan): Submit plan addressing opportunities for reduction, reuse, or recycling of materials prepared in accordance with Section 01 74 19– Construction Waste Management and Disposal.

.2 Landfill Records: Indicate receipt and acceptance of selective demolition waste.

1.6 ADMINISTRATIVE REQUIREMENTS

.1 Coordination: Coordinate work of this Section to avoid interference with work by other Sections.

.2 Scheduling: Account for building Owner's continued occupancy requirements during selective demolition and schedule staged occupancy and worksite activities.

1.7 QUALITY ASSURANCE

.1 Regulatory Requirements: Perform work of this Section in accordance with:

.1 NB Provincial Workers' Compensation Boards/Commissions & Federal Workers' Compensation Service

.2 Government of Canada, Labour Program: Workplace Safety & Provincial/Territorial Occupational Health and Safety Standards and Programs

1.8 SITE CONDITIONS

.1 Existing Conditions: Condition of materials identified as being salvaged or demolished is based on their observed condition on date that tender is accepted.

.2 Discovery of Hazardous Substances: immediately notify [Consultant] [Representative] if materials suspected of containing hazardous substances are encountered and perform following activities:

.1 Refer to Section 01 41 00– Regulatory Requirements for directives associated with specific material types.

.2 Hazardous substances will be as defined in Hazardous Products Act.

.3 Stop work in area of suspected hazardous substances.

.4 Take preventative measures to limit users' and workers' exposure, provide barriers and other safety devices and do not disturb.

.5 Proceed only after written instructions have been received from project/construction management.

Part 2 Products

2.1 NOT USED REPAIR MATERIALS

.1 Electrical Repair Materials: Use only new materials, CSA or ULC labelled as appropriate and matching components remaining after work associated with components identified for removal or demolition are completed.

.2 Firestopping Repair Materials: Use firestopping materials compatible with existing firestopping systems where removal or demolition work affects rated assemblies, restore to match existing fire rated performance.

2.2 SALVAGE AND DEBRIS MATERIALS

.1 Material Ownership: Demolished materials become Contractor's property and will be removed from Project site; except for items indicated as being reused, salvaged, reinstalled, or otherwise indicated to remain Owner property.

.2 Salvaged Materials: Carefully remove materials designated for salvage and store in a manner to prevent damage or devaluation of materials in accordance with Section 02 42 00and as follows:

.1 Leave main electrical distribution panel in place; panel can be used for temporary construction power for this and subsequent contracts in accordance with Section 01 50 00– Temporary Facilities; coordinate temporary power connections with .

.2 Leave main telephone terminal backboard in place; panel can be used for temporary construction telephone system for this and subsequent contracts in accordance with Section 01 50 00– Temporary Facilities; coordinate temporary telephone connections with .

Part 3 Execution

3.1 EXAMINATION

.1 Verification of Existing Conditions: Visit site, thoroughly examine and become familiar with conditions that may affect work of this Section before tendering Bid; owner will not consider claims for extras for work or materials necessary for proper execution and completion of contract that could have been determined by a site visit.

3.2 PREPARATION

.1 Protection of Existing Systems to Remain: Protect systems and components indicated to remain in place during selective demolition operations and as follows:

.1 Prevent movement and install bracing to prevent settlement or damage of adjacent services and parts of existing buildings scheduled to remain.

.2 Notify Consultant and Owner and cease operations where safety of buildings being demolished, adjacent structures or services appears to be endangered and await additional instructions before resuming demolition work specified in this Section.

.3 Prevent debris from blocking drainage inlets.

.4 Protect mechanical systems that will remain in operation.

.2 Protection of Building Occupants: Sequence demolition work so that interference with use of the building by Owner and users is minimized and as follows:

.1 Prevent debris from endangering safe access to and egress from occupied buildings.

.2 Notify Consultant and Owner and cease operations where safety of occupants appears to be endangered and await additional instructions before resuming demolition work specified in this Section.

3.3 EXECUTION

.1 Demolition: Coordinate requirements of this Section with information contained in Section 02 41 19.13 Section 02 41 19.19 and as follows:

.1 Disconnect electrical circuits and panel feeders; maintain electrical service and main distribution panel as is, ready for subsequent Work.

.2 Remove existing luminaires, electrical devices and equipment including associated conduits, boxes, wiring, and similar items unless specifically noted otherwise.

.3 Disconnect and remove existing fire alarm system components including associated conduits, boxes, wiring, and similar items unless specifically noted otherwise.

.4 Disconnect and remove communication systems including associated conduits, boxes, cabling, and similar items unless specifically noted otherwise.

.5 Disconnect and remove telephone outlets, associated conduit, cabling and sub terminal backboards and related accessories; maintain telephone service and main terminal backboard as is.

.6 Perform demolition work in a neat and workmanlike manner:

.1 Remove tools or equipment after completion of work, and leave site clean and ready for subsequent renovation work.

.2 Repair and restore damages caused as a result of work of this Section to match existing materials and finishes.

.7 Disconnect panel feeders back to main distribution panel and re label respective circuit breaker as “SPARE”.

.8 Place weatherproof blank cover plates on exterior outlet boxes remaining after demolition and removal activities.

.9 Remove existing conduits, boxes, cabling and wiring associated with removed luminaires, electrical devices and equipment.

.10 Grind off conduits and make flush with surface of concrete where conduits are cast into concrete; seal open ends of conduit with silicone sealant and leave in place.

.11 Seal open ends of conduit with silicone sealant and leave in place where they are inaccessible or cannot be removed without damaging adjacent construction.

3.4 CLOSEOUT ACTIVITIES

.1 Demolition Waste Disposal: Arrange for legal disposal and remove demolished materials to accredited provincial landfill site or alternative disposal site (recycle centre).

.2 Hazardous Substances Disposal: Arrange for disposal of hazardous substances in accordance with requirements of Section 02 81 00.

END OF SECTION

Part 1 Products

1.1 MATERIALS

.1 Pressure type wire connectors to: CAN/CSA-C22.2 No.65 , with current carrying parts of copper sized to fit copper conductors as required.

.2 Fixture type splicing connectors to: CAN/CSA-C22.2 No.65 , with current carrying parts of copper sized to fit copper conductors 10 AWG or less.

.3 Bushing stud connectors.

.4 Clamps or connectors for flexible conduit, aluminum sheathed cable, armoured cable, mineral insulated cable, non-metallic sheathed cable, TECK cable as required to: CAN/CSA-C22.2 No.18 .

Part 2 Execution

2.1 INSTALLATION

.1 Remove insulation carefully from ends of conductors cables and:

.1 Apply coat of zinc joint compound on aluminum conductors prior to installation of connectors.

.2 Install mechanical pressure type connectors and tighten screws with appropriate compression tool recommended by manufacturer. Installation shall meet secureness tests in accordance with CAN/CSA-C22.2 No.65.

.3 Install fixture type connectors and tighten to CAN/CSA-C22.2 No.65 . Replace insulating cap.

.4 Install bushing stud connectors in accordance with EEMAC 1Y-2.

END OF SECTION

Part 1 General

1.1 PRODUCT DATA

.1 Provide product data in accordance with Section 01 33 00- Submittal Procedures.

Part 2 Products

2.1 BUILDING WIRES

.1 Conductors: stranded for 10 AWG and larger. Minimum size: 12 AWG.

.2 Copper conductors: size as indicated, with 600 insulation of cross-linked thermosetting polyethylene material rated RW90 XLPE.

2.2 TECK 90 CABLE

.1 Cable: in accordance with Section 26 05 00- Common Work Results for Electrical.

.2 Conductors:

.1 Grounding conductor: copper.

.2 Circuit conductors: copper, size as indicated.

.3 Insulation:

.1 Cross-linked polyethylene XLPE.

.2 Rating:, 600V.

.4 Inner jacket: polyvinyl chloride material.

.5 Armour: interlocking aluminum.

.6 Overall covering: thermoplastic polyvinyl chloride.

.7 Fastenings:

.1 Two hole steel straps for cables larger than 50 mm.

.2 Channel type supports for two or more cables at

.3 Threaded rods: 6 mm diameter to support suspended channels.

.8 Connectors:

.1 Standard approved for TECK cable.

2.3 ARMOURED CABLES

.1 Conductors: insulated, copper, size as indicated.

.2 Type: AC90.

.3 Armour: interlocking type fabricated from aluminum strip.

.4 Connectors: anti short connectors.

2.4 WIRE IN CONDUIT

.1 Cable: in accordance with Section 26 05 00- Common Work Results for Electrical.

.2 Conductors:

.1 Circuit conductors: copper, size as indicated.

.3 Insulation:

.1 RW90.

.2 Rating:, 600V.

.4 Inner jacket: polyvinyl chloride material.

Conduit: EMT complete with fittings.

Part 3 Execution

3.1 FIELD QUALITY CONTROL

.1 Perform tests in accordance with Section 26 05 00- Common Work Results for Electrical.

.2 Perform tests before energizing electrical system.

3.2 GENERAL CABLE INSTALLATION

.1 Terminate cables in accordance with Section 26 05 20- Wire and Box Connectors - (0-1000 V) .

.2 Cable Colour Coding: to Section 26 05 00- Common Work Results for Electrical .

.3 Conductor length for parallel feeders to be identical.

.4 Lace or clip groups of feeder cables at distribution centres, pull boxes, and termination points.

.5 Wiring in walls: typically drop or loop vertically from above to better facilitate future renovations. Generally wiring from below and horizontal wiring in walls to be avoided unless indicated.

.6 Branch circuit wiring for surge suppression receptacles and permanently wired computer and electronic equipment to be 2-wire circuits only, i.e. common neutrals not permitted.

.7 Provide numbered wire collars for control wiring. Numbers to correspond to control shop drawing legend. Obtain wiring diagram for control wiring.

3.3 INSTALLATION OF BUILDING WIRES

.1 Install wiring as follows:

.1 In conduit systems in accordance with Section 26 05 34- Conduits, Conduit Fastenings and Conduit Fitting.

3.4 INSTALLATION OF TECK90 CABLE (0 -1000 V)

.1 Group cables wherever possible on channels.

.2 Install cable exposed , securely supported by straps.

.3 Install straps and box connectors to cables as required.

END OF SECTION

Part 1 Products

1.1 SUPPORT CHANNELS

.1 U shape, size 41 x 41 mm, 2.5mm thick, surface mounted.

Part 2 Execution

2.1 INSTALLATION

.1 Secure equipment to surfaces as required meeting standard practices.

.2 Secure equipment to hollow masonry walls or suspended ceilings with toggle bolts.

.3 Secure surface mounted equipment with twist clip fasteners to inverted T bar ceilings. Ensure that T bars are adequately supported to carry weight of equipment specified before installation.

.4 Support equipment, conduit or cables using clips, spring loaded bolts, cable clamps designed as accessories to basic channel members.

.5 Fasten exposed conduit or cables to building construction or support system using straps.

- .1 One-hole straps to secure surface conduits and cables 50 mm and smaller.
- .2 Two-hole steel straps for conduits and cables larger than 50 mm.
- .3 Beam clamps to secure conduit to exposed steel work.

.6 Suspended support systems.

- .1 Support individual cable or conduit runs with 6 mm diameter threaded rods and spring clips.
- .2 Support 2 or more cables or conduits on channels supported by 6 mm diameter threaded rod hangers where direct fastening to building construction is impractical.

.7 Provide metal brackets, frames, hangers, clamps and related types of support structures where indicated or as required to support conduit and cable runs.

.8 Ensure adequate support for raceways and cables dropped vertically to equipment where there is no wall support.

.9 Do not use wire lashing or perforated strap to support or secure raceways or cables.

.10 Do not use supports or equipment installed for other trades for conduit or cable support except with permission of other trade and approval.

.11 Install fastenings and supports as required for each type of equipment cables and conduits, and in accordance with manufacturer's installation recommendations.

END OF SECTION

Part 1 Products

1.1 SPLITTERS

.1 Construction: sheet metal enclosure, welded corners and formed hinged cover suitable for locking in closed position.

.2 Terminations: connection blocks to match required size and number of incoming and outgoing conductors as indicated.

.3 Spare Terminals: minimum three spare terminals or lugs on each connection or lug block sized less than 400 A.

1.2 JUNCTION AND PULL BOXES

.1 Construction:welded steel enclosure.

.2 Covers Flush Mounted: 25 mm minimum extension all around.

.3 Covers Surface Mounted: screw-on covers.

1.3 CABINETS

.1 Construction: welded aluminum as indicated hinged door and Latch.

Part 2 Execution

2.1 SPLITTER INSTALLATION

.1 Mount plumb, true and square to building lines.

.2 Extend splitters full length of equipment arrangement except where indicated otherwise.

2.2 JUNCTION, PULL BOXES AND CABINETS INSTALLATION

.1 Install pull boxes in inconspicuous but accessible locations.

.2 Mount cabinets with top not higher than 2 m above finished floor except where indicated otherwise.

.3 Only main junction and pull boxes are indicated. Install additional pull boxes as required by CSA C22.1.

2.3 IDENTIFICATION

.1 Equipment Identification: to Section 26 05 00- Common Work Results for Electrical.

.2 Identification Labels: size 2 indicating voltage and phase & system name or as indicated.

END OF SECTION

Part 1 Products

1.1 OUTLET AND CONDUIT BOXES GENERAL

.1 Size boxes in accordance with CSA C22.1.

.2 102 mm square or larger outlet boxes as required.

.3 Gang boxes where wiring devices are grouped.

.4 Blank cover plates for boxes without wiring devices.

.5 120 V outlet boxes for 120 V switching devices.

.6 Combination boxes with barriers where outlets for more than one system are grouped.

1.2 GALVANIZED STEEL OUTLET BOXES

.1 One-piece electro-galvanized construction.

.2 Single and multi gang flush device boxes for flush installation, minimum size 76 x 50 x 38 mm or as indicated. 102 mm square outlet boxes when more than one conduit enters one side with extension and plaster rings as required.

.3 Utility boxes for outlets connected to surface-mounted EMT conduit, minimum size 102 x 54 x 48 mm.

.4 102 mm square or octagonal outlet boxes for lighting fixture outlets.

.5 Extension and plaster rings for flush mounting devices in finished walls.

1.3 CONDUIT BOXES

.1 Cast FS boxes with factory-threaded hubs and mounting feet for surface wiring of devices.

1.4 OUTLET BOXES FOR NON-METALLIC SHEATHED CABLE

.1 Electro-galvanized, sectional, screw ganging steel boxes, minimum size 76 x 50 x 63mm with two double clamps to take non-metallic sheathed cables.

1.5 FITTINGS - GENERAL

.1 Bushing and connectors with nylon insulated throats.

.2 Knock-out fillers to prevent entry of debris.

.3 Conduit outlet bodies for conduit up to 35 mm and pull boxes for larger conduits.

.4 Double locknuts and insulated bushings on sheet metal boxes.

Part 2 Execution

2.1 INSTALLATION

.1 Support boxes independently of connecting conduits.

.2 Fill boxes with paper, sponges or foam or similar approved material to prevent entry of debris during construction. Remove upon completion of work.

.3 For flush installations mount outlets flush with finished wall using plaster rings to permit wall finish to come within 6 mm of opening.

.4 Provide correct size of openings in boxes for conduit, mineral insulated and armoured cable connections. Do not install reducing washers.

.5 Vacuum clean interior of outlet boxes before installation of wiring devices.

.6 Identify systems for outlet boxes as required.

END OF SECTION

Part 1 Products

1.1 CABLES AND REELS

.1 Provide cables on reels or coils.

.1 Mark or tag each cable and outside of each reel or coil, to indicate cable length, voltage rating, conductor size, and manufacturer's lot number and reel number.

.2 Each coil or reel of cable to contain only one continuous cable without splices.

.3 Identify cables for exclusively dc applications.

1.2 CONDUITS

.1 Rigid metal conduit: to CSA C22.2 No. 45, threaded.

.2 Epoxy coated conduit: to CSA C22.2 No. 45, with zinc coating and corrosion resistant epoxy finish inside and outside.

.3 Electrical metallic tubing (EMT): to CSA C22.2 No. 83.

.4 Rigid pvc conduit: to CSA C22.2 No. 211.2.

.5 Flexible metal conduit: to CSA C22.2 No. 56.

.6 Flexible pvc conduit: to CAN/CSA-C22.2 No. 227.3

1.3 CONDUIT FASTENINGS

.1 One hole steel straps to secure surface conduits 50 mm and smaller.

.2 Beam clamps to secure conduits to exposed steel work.

.3 Channel type supports for two or more conduits

.4 Threaded rods, 6 mm diameter, to support suspended channels.

1.4 CONDUIT FITTINGS

.1 Fittings: CAN/CSA C22.2 No. 18, manufactured for use with conduit specified. Coating: same as conduit.

.2 Ensure factory "ells" where 90 degrees bends for NPS 1 25 mm and larger conduits.

.3 Watertight connectors and couplings for EMT.

.1 Set-screws are not acceptable.

1.5 EXPANSION FITTINGS FOR RIGID CONDUIT

.1 Watertight expansion fittings with integral bonding jumper suitable for linear expansion and 19 mm deflection.

.2 Weatherproof expansion fittings for linear expansion at entry to panel.

Part 2 Execution

2.1 MANUFACTURER'S INSTRUCTIONS

.1 Compliance: comply with manufacturer's written recommendations or specifications, including product technical bulletins, handling, storage and installation instructions, and datasheets.

2.2 INSTALLATION

.1 Install conduits to conserve headroom in exposed locations and cause minimum interference in spaces through which they pass. Conduit to follow building lines.

.2 Install EMT conduit from branch circuit panel to outlet boxes located in sub floor.

.3 Bend conduit cold:

.1 Replace conduit if kinked or flattened more than 1/10th of its original diameter.

.4 Mechanically bend steel conduit over 19 mm diameter.

.5 Field threads on rigid conduit must be of sufficient length to draw conduits up tight.

.6 Install fish cord in empty conduits.

.7 Run 2-NPS 1 25 mm spare conduits up to ceiling space and 2-NPS 1 25 mm spare conduits down to ceiling space from each flush panel.

.1 Terminate these conduits in 152 x 152 x 102 mm junction boxes in ceiling space or in case of an exposed concrete slab, terminate each conduit in surface type box.

.8 Remove and replace blocked conduit sections.

.1 Do not use liquids to clean out conduits.

.9 Dry conduits out before installing wire.

2.3 SURFACE CONDUITS

.1 Run parallel or perpendicular to building lines.

.2 Locate conduits behind infrared or gas fired heaters with 1.5 m clearance.

.3 Run conduits in flanged portion of structural steel.

.4 Group conduits wherever possible on channels.

.5 Do not pass conduits through structural members except as indicated.

.6 Do not locate conduits less than 75 mm parallel to steam or hot water lines with minimum of 25 mm at crossovers.

END OF SECTION

Part 1 General

1.1 REFERENCE STANDARDS

.1 CSA Group (CSA)

.1 CSA C22.2 No.29-11, Panelboards and Enclosed Panelboards.

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 panelboards and include product characteristics, performance criteria, physical size, finish and limitations.

.3 Shop Drawings:

.1 Submit drawings stamped and signed by professional engineer registered or licensed in Province, Canada.

.2 Include on drawings:

.1 Electrical detail of panel, branch breaker type, quantity, ampacity and enclosure dimension.

.4 Sustainable Design Submittals:

.1 Construction Waste Management:

.1 Submit project Management Plan highlighting recycling and salvage requirements.

1.3 CLOSEOUT SUBMITTALS

.1 Submit in accordance with Section 01 78 00- Closeout Submittals.

.2 Operation and Maintenance Data: submit operation and maintenance data for panelboards for incorporation into manual.

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 dry location, indoors, off ground, and in accordance with manufacturer's recommendations in clean, dry, well-ventilated area.

.2 Store and protect panelboards from nicks, scratches, and blemishes.

.3 Replace defective or damaged materials with new.

Part 2 Products

2.1 PANELBOARDS

.1 Panelboards: to CSA C22.2 No.29 and product of one manufacturer.

.1 Install circuit breakers in panelboards before shipment.

.2 In addition to CSA requirements manufacturer's nameplate must show fault current that panel including breakers has been built to withstand.

.2 Panelboard rating and voltage as indicated on panelboard schedule(s)

.3 Sequence phase bussing with odd numbered breakers on left and even on right, with each breaker identified by permanent number identification as to circuit number and phase.

.4 Panelboards: mains, number of circuits, and number and size of branch circuit breakers as indicated.

.5 Minimum of 2 flush locks for each panel board.

.6 Two keys for each panelboard and key panelboards alike.

.7 Copper bus with neutral of same ampere rating of mains.

.8 Mains: suitable for bolt-on breakers.

.9 Trim with concealed front bolts and hinges.

.10 Trim and door finish: baked enamel.

.11 Isolated ground bus.

.12 Include grounding busbar with 3 of terminals for bonding conductor equal to breaker capacity of the panel board.

2.2 BREAKERS

.1 Breakers: to Section 26 28 16.02- Moulded Case Circuit Breakers.

.2 Breakers with thermal and magnetic tripping in panelboards except as indicated otherwise.

.3 Main breaker: separately mounted on top or bottom of panel to suit cable entry. When mounted vertically, down position should open breaker.

.1 Lock-on devices for 10% of 15 to 30 A breakers installed as indicated. Turn over unused lock-on devices to Owner / Owner representative.

.2 Lock-on devices for receptacles, fire alarm, emergency, door supervisory, intercom , stairway, exit and night light circuits.

2.3 EQUIPMENT IDENTIFICATION

.1 Provide equipment identification in accordance with Section 26 05 00- Common Work Results for Electrical .

.2 Nameplate for each panelboard size 4 engraved as indicated.

.3 Nameplate for each circuit in distribution panelboards size 2 engraved as indicated.

.4 Complete circuit directory with typewritten legend showing location and load of each circuit, mounted in plastic envelope at inside of panel door.

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 panelboards installation in accordance with manufacturer's written instructions.

.1 Visually inspect substrate in presence of Consultant.

.2 Inform Consultant & Owner of unacceptable conditions immediately upon discovery.

.3 Proceed with installation only after unacceptable conditions have been remedied and after receipt of written approval to proceed from Consultant.

3.2 INSTALLATION

.1 Locate panelboards as indicated and mount securely, plumb, true and square, to adjoining surfaces.

.2 Install surface mounted panelboards on plywood backboards in accordance with Section 06 10 00- Rough Carpentry. Where practical, group panelboards on common backboard.

.3 Mount panelboards to height specified in Section 26 05 00- Common Work Results for Electrical or as indicated.

.4 Connect loads to circuits.

.5 Connect neutral conductors to common neutral bus with respective neutral identified.

.6 Where panels of different systems (i.e. Standard and Vital Power) supply a common patient care area, ground busses in panels to be interconnect with a minimum #6 AWG ground conductor.

3.3 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.

3.4 PROTECTION

.1 Protect installed products and components from damage during construction.

.2 Repair damage to adjacent materials caused by panelboards installation.

END OF SECTION

Part 1 Products

1.1 SWITCHES

.1 15 A, 120 V, single pole, switches to: SA C22.2 No.55 .

.2 Manually-operated general purpose AC switches with following features:

- .1 Terminal holes approved for No. 10 AWG wire.
- .2 Silver alloy contacts.
- .3 Urea or melamine moulding for parts subject to carbon tracking.
- .4 Suitable for back and side wiring.
- .5 Ivory toggle.

.3 Switches of one manufacturer throughout project.

1.2 RECEPTACLES

.1 Duplex receptacles, CSA type 5-15 R, 125 V, 15 A, U ground, to: CSA C22.2 No.42 with following features:

- .1 White urea moulded housing.
- .2 Suitable for No. 10 AWG for back and side wiring.
- .3 Break-off links for use as split receptacles.
- .4 Eight back wired entrances, four side wiring screws.
- .5 Triple wipe contacts and rivetted grounding contacts.

.2 Single receptacles CSA type 5-15 R, 125 V, 15 A, U ground with following features:

- .1 White urea moulded housing.
- .2 Suitable for No. 10 AWG for back and side wiring.
- .3 Four back wired entrances, 2 side wiring screws.

.3 Other receptacles with ampacity and voltage as indicated.

.4 Receptacles of one manufacturer throughout project.

1.3 COVER PLATES

.1 Cover plates for wiring devices to: CSA C22.2 No.42.1.

.2 Sheet steel utility box cover for wiring devices installed in surface-mounted utility boxes.

.3 Plastic ivory cover plates, thickness 2.5 mm for wiring devices mounted in flush-mounted outlet box.

.4 Sheet metal cover plates for wiring devices mounted in surface-mounted FS or FD type conduit boxes.

.5 Weatherproof double lift spring-loaded cast aluminum cover plates, complete with gaskets for duplex receptacles as indicated.

.6 Weatherproof spring-loaded cast aluminum cover plates complete with gaskets for single receptacles or switches.

1.4 SOURCE QUALITY CONTROL

.1 Cover plates from one manufacturer throughout project.

1.5 INSTALLATION

.1 Switches:

.1 Install single throw switches with handle in "UP" position when switch closed.

.2 Install switches in gang type outlet box when more than one switch is required in one location.

.3 Mount toggle switches at height in accordance with Section 26 05 00- Common Work Results for Electrical.

.2 Receptacles:

.1 Install receptacles in gang type outlet box when more than one receptacle is required in one location.

.2 Mount receptacles at height accordance with Section 26 05 00- Common Work Results for Electrical.

.3 Where split receptacle has one portion switched, mount vertically and switch upper portion.

.4 Install GFI type receptacles as indicated.

.3 Cover plates:

.1 Install suitable common cover plates where wiring devices are grouped.

.2 Do not use cover plates meant for flush outlet boxes on surface-mounted boxes.

.4 Public Address:

.1 Speakers and controls to match existing Public Address in the building.

.5 CCTV:

.1 Indoor ready WIFI ready cameras. Lorex W261AQC or equal.

.2 Display screen to be Lorex Home Center or equal.

1.6 PROTECTION

.1 Protect installed products and components from damage during construction.

.2 Protect stainless steel cover plate finish with paper or plastic film until painting and other work is finished.

.3 Repair damage to adjacent materials caused by wiring device installation.

END OF SECTION

Part 1 Products

1.1 LED

.1 Fixtures to match fixture schedule provide on contract drawings. No deviations are to be taken unless otherwise approved.

1.2 FINISHES

.1 Light fixture finish and construction to meet ULC listings and CSA certifications related to intended installation.

1.3 OPTICAL CONTROL DEVICES

.1 As indicated in luminaire schedule.

1.4 LUMINAIRES

.1 As indicated in luminaire schedule.

Part 2 Execution

2.1 INSTALLATION

.1 Locate and install luminaires as indicated.

.2 Provide adequate support to suit ceiling system.

2.2 WIRING

.1 Connect luminaires to lighting circuits:

.1 Install flexible or rigid conduit for luminaires as indicated.

2.3 LUMINAIRE SUPPORTS

.1 For suspended ceiling installations.

2.4 LUMINAIRE ALIGNMENT

.1 Align luminaires mounted in continuous rows to form straight uninterrupted line.

.2 Align luminaires mounted individually parallel or perpendicular to building grid lines.

END OF SECTION

Part 1 General

1.1 RELATED REQUIREMENTS

.1 Section 26 05 00 – Common Work Results for Electrical

1.2 REFERENCE STANDARDS

.1 Codes and Standards referenced in this section refer to the latest edition thereof:

.2 Canadian Standards Association (CSA)

.1 CSA 22.1 – Canadian Electrical Code, Part 1

.2 CSA C22.2 No.141, Emergency Lighting Equipment

.3 CSA C860-11, Performance of Internally-Lighted Exit Signs

.3 National Building Code of Canada

1.3 ACTION AND INFORMATIONAL SUBMITTALS

.1 Provide submittals in accordance with Section 26 05 00 – Common Work Results for Electrical.

Part 2 Products

2.1 SELF-POWERED UNITS

.1 Exit lights: to CSA C22.2 No.141 and CSA C860.

.2 Housing: as indicated in fixture schedule.

.3 Faceplates: High quality, clear acrylic, GREEN running man logo with directional arrow as indicated.

.4 Lamps: LED-2 watt power consumption.

.5 Operation: designed for 25 years of continuous operation.

.6 120/347V AC inputs, field selectable.

.7 Operating time: 90 minutes minimum

.8 Recharge time: 12 hours.

.9 Battery: sealed, maintenance free, nickel cadmium.

.10 Charger: Solid state, voltage/current regulated, inverse temperature compensated, short circuit protected with regulated output of plus or minus 0.01 V for plus or minus 10% V input variation.

.11 Single or double face as indicated on drawings.

.12 Finish: White.

.13 Solid State transfer circuit.

.14 Signal Lights: solid state, for “AC Power on” and “High Charge” condition.

.15 Mounting: suitable for universal mounting directly on junction box and c/w knockouts for conduit.

.16 Removable or hinged front panel for easy access to battery.

.17 Auxiliary equipment:

.1 Test Switch

.2 AC/DC output block inside cabinet

.3 RFI Suppressor

Part 3 Execution

3.1 MANUFACTURER'S INSTRUCTIONS

.1 Compliance: comply with manufacturer's written recommendations or specifications, including product technical bulletins, handling, storage and installation instructions, and datasheets.

3.2 INSTALLATION

.1 Install exit lights to manufacturer's recommendations, listing requirements, NBCC standard and local regulatory requirements.

.2 Connect fixtures to exit light circuits.

.3 Ensure that exit sign circuit is locked in on position.

.4 Provide tests in accordance with Section 26 05 00 – Common Work Results for Electrical

END OF SECTION

Part 1 General

1.1 RELATED SECTIONS

.1 Section 26 05 28 – Grounding - Secondary.

1.2 REFERENCES

.1 American National Standards Institute

.1 ANSI J-STD-607-C, Joint Standard - Commercial Building Grounding (Earthing) and Bonding Requirements for Telecommunications.

.2 Telecommunications Industries Association (TIA)/Electronic Industries Alliance (EIA)

.1 TIA/EIA-606, Administration Standard for the Commercial Telecommunications Infrastructure.

.3 U.S. Department of Labor/Occupational Safety and Health Administration (OSHA)

.1 Nationally Recognized Testing Laboratory (NRTL).

1.3 SYSTEM DESCRIPTION

.1 Telecommunications grounding and bonding system consist of grounding busbars, bonding backbones, and other bonding conductors.

.2 Provides ground reference for telecommunications systems within building and bonding to it of telecommunications rooms.

.3 Metallic pathways, cable shields, conductors, and hardware within telecommunications spaces are bonded to telecommunications grounding and bonding system.

Part 2 Products

2.1 TELECOMMUNICATIONS MAIN GROUNDING BUSBAR (TMGB)

.1 Predrilled copper busbar, listed by NRTL electrotin plated]with holes 8 mm diameter for use with standard-sized lugs to: ANSI J-STD-607-B.

.2 Dimensions 6 mm thick, 100 mm wide, 610 mm long to: ANSI J-STD-607-B.

2.2 TELECOMMUNICATIONS GROUNDING BUSBAR (TGB)

.1 Predrilled copper busbar, listed by NRTL electrotin plated with holes 8 mm diameter for use with standard-sized lugs to: ANSI J-STD-607-B.

.2 Dimensions 6 mm thick, 100 mm wide, 610 mm long to: ANSI J-STD-607-B.

2.3 BONDING CONDUCTOR FOR TELECOMMUNICATIONS

.1 3/0 AWG copper conductor, green insulated to: ANSI J-STD-607-B.

2.4 TELECOMMUNICATIONS BONDING BACKBONE (TBB)

.1 3/0 AWG copper conductor, green insulated to:ANSI J-STD-607-B.

Part 3 Execution

3.1 TELECOMMUNICATIONS MAIN GROUNDING BUSBAR (TMGB)

.1 Install TMGB in entrance room on insulated supports 50 mm high at location close to electrical power panel if one is installed in same room as indicated.

.2 Install 3/0 AWG copper bonding conductor from TMGB to alternating current equipment ground (ACEG)] of serving electrical power panel.

3.2 TELECOMMUNICATIONS GROUNDING BUSBAR (TGB)

.1 Install TGB in main terminal/equipment room and each telecommunications room.

.2 Install 3/0 AWG copper bonding conductor from TGB to TMCB.

3.3 BONDING CONDUCTORS GENERAL

.1 When placed in ferrous metallic conduit or EMT longer than 1 m, bond to each end of conduit or EMT using grounding bushing 6 AWG copper conductor.

3.4 BONDING CONDUCTOR FOR TELECOMMUNICATIONS

.1 Install bonding conductor for telecommunications from TMGB to service equipment (power) ground.

.2 Use 2 hole compression lugs lugs for connection to TMGB.

3.5 TELECOMMUNICATIONS BONDING BACKBONE (TBB)

.1 Install TBBs from TMGB to each TGB as indicated.

.2 Use 2 hole compression lugs for connection to TMGB and TGBs.

3.6 BONDING TO TMGB

.1 Bond metallic raceways in electrical room to TMGB using #6AWG green insulated copper conductor.

3.7 BONDING TO TGB

.1 Bond metallic raceways in electrical room to TMGB using #6AWG green insulated copper conductor.

3.8 LABELLING

.1 Apply warning labels to telecommunications bonding and grounding conductors.

.2 Apply additional administrative labels to: TIA/EIA-606.

END OF SECTION

Part 1 General

1.1 RELATED REQUIREMENTS

.1 Section 26 05 31 – Splitters, Junction, Pull Boxes and Cabinets.

.2 Section 26 05 34 – Conduits, Conduit Fastenings and Conduit Fittings

Part 2 Products

2.1 SYSTEM DESCRIPTION

.1 Empty telecommunications raceways system consists of outlet boxes, cover plates, cabinets, conduits, cable trays, pull boxes, sleeves and caps, fish wires, service poles, service fittings, concrete encased ducts, as indicated.

.2 Telephone cables supplied installed and tested by Telecom Contractor.

END OF SECTION

APPENDIX A

ASSET & ENERGY MANAGEMENT

SAINT JOHN

Asset & Energy Management

Asset Information Sheet for Contractors

LEVEL 1 CATEGORIES
A. Substructure
B. Shell
C. Interiors
D. Services
E. Equipment and Furnishings
F. Special Construction and Demolition
G. Building Site work
H. Process
(Level 2 and Level 3 on back)

CONTRACTOR _____

INSTALLATION DATE _____

REPLACEMENT COST _____

FACILITY NAME _____

LEVEL 1 CATEGORY _____

LEVEL 2 CATEGORY _____

LEVEL 3 CATEGORY _____

DESCRIPTION _____

EXPECTED USEFUL LIFE _____

MODEL NUMBER (If Applicable) _____

SERIAL NUMBER (If Applicable) _____

MANUFACTURER _____

MANUFACTURER'S WARRANTY _____

WARRANTY _____

LABOUR AND MATERIALS _____

MANUAL _____

ADDITIONAL INFORMATION _____

SAINT JOHN

Asset & Energy Management

Asset Information Sheet for Contractors

Level 2 Categories	Level 3 Categories
A10. Foundations A20. Basement Construction	A1010. Standard Foundations A1020. Special Foundations A1030. Slab on Grade A2010. Basement Excavation A2020. Basement Walls
B10. Superstructure B20. Exterior Enclosure B30. Roofing	B1010. Floor Construction B1020. Roof Construction B2010. Exterior Walls B2020. Exterior Windows B2030. Exterior Doors B3010. Roof Coverings B3020. Roof Openings
C10. Interior Construction C20. Stairs C30. Interior Finishes	C1010. Partitions C1020. Interior Doors C1030. Fittings C2010. Stair Construction C2020. Stair Finishes C3010. Wall Finishes C3020. Floor Finishes C3030. Ceiling Finishes
D10. Conveying D20. Plumbing D30. HVAC D40. Fire Protection D50. Electrical	D1010. Elevators and Lifts D1020. Escalators and Moving Walks D1030. Other Conveying Systems D2010. Plumbing Fixtures D2020. Domestic Water Distribution D2030. Sanitary Waste D2040. Rain Water Drainage D2090. Other Plumbing Systems D3010. Energy Supply D3020. Heat Generating Systems D3030. Cooling Generating Systems D3040. Distribution Systems D3050. Terminal and Package Units D3060. Controls and Instrumentation D3070. Systems Testing and Balancing D3090. Other HVAC Systems and Equipment D4010. Sprinklers D4020. Standpipes D4030. Fire Protection Specialties D4090. Other Fire Protection Systems D5010. Electrical Service and Distribution D5020. Lighting and Branch Wiring D5030. Communications and Security D5090. Other Electrical Systems
E10. Equipment E20. Furnishings	E1010. Commercial Equipment E1020. Institutional Equipment E1030. Vehicular Equipment E1040. Ice Plant Refrigeration Equipment E1090. Other Equipment E2010. Fixed Furnishings
F10. Special Construction F20. Selective Building Demolition	F1050. Special Controls and Equipment F2010. Building Elements Demolition F2020. Hazardous Components Abatement
G10. Site Preparation G20. Site Improvements G30. Site Mechanical Utilities G40. Site Electrical Utilities G90. Other Site Construction	G1010. Site Clearing G1020. Site Demolition and Relocations G1030. Site Earthwork G1040. Hazardous Waste Remediation G2010. Roadways G2020. Parking Lots G2030. Pedestrian Paving G2040. Site Development G2050. Landscaping G3010. Water Supply G3020. Sanitary Sewer G3030. Storm Sewer G3040. Heating Distribution G3050. Cooling Distribution G3060. Fuel Distribution G3090. Other Site Mechanical Utilities G4010. Electrical Distribution G4020. Site Lighting G4030. Site Communications and Security G4090. Other Site Electrical Utilities G9010. Service and Pedestrian Tunnels G9090. Other Site Systems and Equipment
H10. Process Piping and Equipment H20. Process Structural H30. Process Instrumentation and Control H40. Process Electrical	H1010. Valves H1020. Chlorinators H2010. Thrust Blocks H2020. Platforms and Safety Apparatus H3010. Gas Detection H3020. SCADA H4010. Process Electrical Service & Distribution H4020. Process Lighting and Branch Wiring H4030. Process Communications and Security H4040. Process Other Electrical Systems

CEAR Project – City of Saint John - Fire Station 1

Notes and Clarifications

Drawings A-1 to A-4

Demolition – Mobile Truck Radio outlets and cabling – Room 221 EOC

- If not otherwise specified in the detailed specifications, bid price is to include the cost to removal of all old mobile trunk radio wall connections and cabling. To be removed from the wall and along that portion of the ceiling grid being replaced. The cabling can be cut in place at its furthest accessible point and disposed.

Demolition – common walls with room 203

- If not otherwise specified in the detailed specifications and prior to demolition, the bid price is to include cost the erect a temporary fire rated wall or other acceptable barrier between the unaffected portions of Room 203 (Dorm) and the expanded Room 220. This is for the purpose of preventing the transfer of dust, to reduce noise and protect the balance of Room 203 from undue fire exposure until construction in that area is completed.

Drawings E-1 to E-4

Construction - Kitchenette

- Where the Drawing and Specification call for the GFI receptacles in the Kitchenette to be 15 amps (locations A-21 on Drawing E-1) and where the intended use may draw more amperes, the bid price is to include cost net cost to delete the two (2) 15 amp GFI receptacles, identified as locations A-21 on Drawing E-1, and in their place install two (2) 20 amp GFI receptacles both on dedicated circuits. The intent of this change is permit the use multiple small appliances without overloading the circuit.

Data Technologies

- If not otherwise specified in the detailed specifications and to be included as part of the bid price, all data and wireless demolition and installation work as referenced in Notes 1-5 on Drawing E-4 must be coordinated with the City of Saint John Information Technology Division, when applicable.

- If not otherwise specified in the detailed specifications, the bid price for all CAT 6 data cable shall be for ***Belden*** brand cable.

- If not otherwise specified in the detailed specifications and to be included as part of the bid price, any wall in Room 221 (EOC) which physically has an existing (working) data connection and where a new data connection is not shown on or along the same wall (and not part of the

'wall boxes'), the existing data connection is to the kept, relocated to standard height (where applicable), new cap plates installed and all wall repairs completed.

CCTV – location and Avigilon compatible

- Where Drawing E-4 illustrate the location of the CCTV hardware in the corner of the room, the actual location will be close to ceiling between Work Stations 2 and 3 on the south wall (of the drawing) facing north (with a corresponding remote microphone on the north wall); and the other camera will be centered on the northern wall, facing the work stations on the south wall (with a remote microphone on the south wall of the drawing). All CCTV hardware and software must be compatible with the Avigilon system. Where applicable installation and server set-up must be coordinated with the City's Information Technology Division.

Panduits from Server Location – need to be confined by Environmental Tectonic Corporation

- If not otherwise specified in the detailed specifications and to form part of the bid price, all panduits to the workstation 1 through to 4, are to the run from the proposed server rack location horizontal along the wall as per the suggest cabling layout provided by Environmental Tectonics Corporations (ETC) of Orlando, Florida. *https://www.etcsimulation.com/*
  ETC's graphics are available upon request.

Room 221 (EOC) – floor mounted data, telephone, power, and Smart Board connections

- If not otherwise specified in the detailed specifications and to form part of the bid price, the old data, power, phone, and Smart Board pack located on the floor in the middle of Room 221 (EOC) is to be removed and replaced with a recessed flush mount(s) arrangement to include:
  - 2 power electrical outlets – 15 Amp, existing circuit
  - 4 data outlets – reuse existing if less costly
  - 2 phone outlets (with only one phone outlet assigned);
  - 1 HDMI (cabled to the 75-inch TV – new)
  - Delete and remove Smart Board connections and wiring

  If functional the existing power, telephone and data cables can be reused. Smart board connections to be deleted. HDMI is new. HDMI is to run back to the proposed location of the 75-inch TV / Monitor on the east wall of room 221 (EOC).

Notes:

1. Nothing here in is intended to in negate the overall design concept put forth by the Architect. The intent is solely to cover incidental items not fundamental to the design, but critical to the functionality of the Emergency Operations Centre (EOC).

2. If not otherwise specified in the detailed specifications and to form part of the bid price and due to contract arrangements with Environmental Tectonic Corporation (ETC) for computer hardware and software for the proposed simulation theatre, it is requested that work pertaining to Room 226 (Simulation Theatre Room) must be substantially completed on or before December 11, 2020 (if practically possible, without paying a premium).

City of Saint John

CONTRACT SPECIFICATIONS

DIVISION 4

FORM OF TENDER

City of Saint John

TABLE OF CONTENTS

DIVISION 4 – FORM OF TENDER

4.1 TENDER IDENTIFICATION

Tender No: **2020-085103T**

Title of Work: **Building Renovations – Fire Station No. 1**

4.2 TENDERER'S RESPONSIBILITIES AND AGREEMENT

TO THE CITY OF SAINT JOHN, NEW BRUNSWICK:

The undersigned hereby agrees that failure to complete all required parts of the Form of Tender shall be subject to the reserved rights of the City and shall be grounds for rejection of the Tender in accordance with Section 2.11

The undersigned Tenderer has carefully examined the site of the Work described herein, has become familiar with local conditions and the character and extent of the Work, has carefully examined every part of the proposed Contract, and thoroughly understands its stipulations, requirements and provisions and has carefully examined all of the following documents which together comprise the Tender Documents:

1. Project Description (Division 1)
2. Instructions to Tenderers and Tendering Procedures (Division 2)
3. The Particular Specifications (Division 3)
4. The Form of Tender (Division 4)
5. The Form of Agreement (Division 5)
6. The General Administration of Contract (Divisions 6)
7. The Plans and Drawings
8. Addenda Issued

together, the "Tender Documents".

The undersigned Tenderer has determined the quality and quantity of materials required, has investigated the location and determined the source of supply of materials required, has investigated labour conditions, and has arranged for the continuous execution of the Work herein described.

The undersigned Tenderer hereby agrees to be bound by the award of the contract, and if awarded the Contract, to sign the Form of Agreement (Division 5) within five (5) working days following the City's Notice of Selection.

In the event the City accepts its Tender, the undersigned Tenderer hereby agrees to Substantially Complete the Work no later than TBD.

The undersigned Tenderer agrees that he has received all Addenda and the Tender Price includes the provisions set out in the Addenda.

4.2 TENDERER'S RESPONSIBILITIES AND AGREEMENT (Cont'd)

The undersigned Tenderer further agrees to provide all necessary permits, approvals, labour, material, plant, equipment, tools, incidentals, products, water, light, heat, power, transportation, facilities, services and other means of the specified requirements which are necessary to complete the work in accordance with the contract and agrees to accept, therefore, in payment in full, the unit prices stated herein in the *Schedule of Quantities and Unit Prices*, **excluding taxes**, for the actual quantities performed in accordance with the drawings and specifications, for the total sum of

_____

_____

_____(Written)_____

in Canadian Funds, which price **excludes HST** (the "Tender Price").

By submitting a Tender, the Tenderer absolutely waives any right, cause of action or claim for any compensation of any kind whatsoever as a result of participating in this Request for Tender Call or by reason of the City's failure to accept the Tender submitted by the Tenderer, and the Tenderer shall be deemed to have agreed to waive such right, cause of action or claim.

Place of Signing: Signed, sealed and delivered at _____

Date of Signing: This _____ day of _____, in the year _____

Name and Title: By_____

Legal Name of Tenderer: _____ *PLACE*

Signature of Tenderer or Authorized Agent: _____ *SEAL*

Signature of Witness: _____ *HERE*

Email of Tenderer: _____

Address of Tenderer: _____

_____

4.3 BONDING AND INSURANCE COMMITMENTS

Failure of the Tenderer to complete Sections 4.3.01, 4.3.02 and 4.3.03 may be grounds for rejection of the Tender.

4.3.01 Tender (Bid) Bond or Certified Cheque

A certified cheque or Tender (Bid) Bond accompanies this Tender, as indicated below:

(a) Certified Cheque

Provided is a certified cheque payable to The City of Saint John in the amount of

_____

Signature of Tenderer or Authorized Agent: _____

(b) Tender (Bid) Bond

Provided is a Tender (Bid) Bond payable to The City of Saint John in the amount of

_____

The Tender (Bid) Bond has been negotiated for, procured from and the premium paid to a New Brunswick resident agent of an insurance company licensed to do business in New Brunswick.

Signature of Tenderer or Authorized Agent: _____

4.3.02 Performance Guarantees

One of the following acceptable forms of Performance Guarantees will accompany the Contract, as indicated below:

(a) Performance Bond

The Performance Bond and the Labour and Material Payment Bond, each at fifty percent (50%) of the Tender Price covering the faithful performance of the full Contract, will be negotiated for, procured from and the premium paid to an insurance company licensed to do business in the Province of New Brunswick.

A surety consent letter or Agreement to Bond must accompany the Tender submission.

Signature of Tenderer or Authorized Agent: _____

4.3.02 Performance Guarantees (Cont'd)

(b) Certified Cheque

In lieu of the performance bond and the labour and material payment bond, we shall supply a certified cheque in the amount of twenty percent (20%) of the Tender Price.

Signature of Tenderer or Authorized Agent: _____

4.3.03 Insurance

The undersigned Tenderer has reviewed the insurance requirements in the Contract. The following provision for contract insurances will be utilized, as indicated below:

The insurance required in the contract will be negotiated for, procured from and the premium paid to an insurance company licensed to do business in the Province of New Brunswick.

Signature of Tenderer or Authorized Agent: _____

4.4 STATEMENTS

A Tender which does not include completed statements at Sections 4.4.01 to 4.4.07 hereunder and the duly completed Schedule of Quantities and Unit Prices at Appendix 4A may be Disqualified.

4.4.01 Reference Regarding Tenderer's Financial Status

Name of Reference: _____

Address of Reference: _____

_____

4.4.02 Particulars of Tenderer's Recent Contracts

The Tenderer shall provide hereunder particulars of at least three (3), and if possible, five (5) contracts which the Tenderer has successfully carried to completion within the last three (3) years, or is now carrying to completion.

Tenderers shall be actually engaged in performing the type and standard of work specified, and the projects referenced below shall be work of a similar character to the Work now being tendered and shall be of comparable or greater size.

Tenderers who have not performed work for The City of Saint John within the last three (3) years shall submit additional information with the Form of Tender that would demonstrate the Tenderer's ability to perform the type and standard of work specified and the Tenderer's financial, technical and project management reliability.

4.4.02 Particulars of Tenderer's Recent Contracts (Cont'd)

Contract 1: Brief description of contract: _____

_____

_____

Owner and contact name: _____

Contractor's supervisor: _____

Year completed: _____ Contract Value: _____

Contract 2: Brief description of contract: _____

_____

_____

Owner and contact name: _____

Contractor's supervisor: _____

Year completed: _____ Contract Value: _____

Contract 3: Brief description of contract: _____

_____

_____

Owner and contact name: _____

Contractor's supervisor: _____

Year completed: _____ Contract Value: _____

4.4.02 Particulars of Tenderer's Recent Contracts (Cont'd)

Contract 4: Brief description of contract: _____

_____

_____

Owner and contact name: _____

Contractor's supervisor: _____

Year completed: _____ Contract Value: _____

Contract 5: Brief description of contract: _____

_____

_____

Owner and contact name: _____

Contractor's supervisor: _____

Year completed: _____ Contract Value: _____

Contract 6: Brief description of contract: _____

_____

_____

Owner and contact name: _____

Contractor's supervisor: _____

Year completed: _____ Contract Value: _____

4.4.03 Particulars of Current Construction Work by Tenderer

If none of the projects described in 4.4.02 were in progress in Canada during the twelve (12) months immediately preceding this Tender, the Tenderer shall provide below particulars of a contract which the Tenderer satisfactorily carried out in Canada during that period.

Brief description of contract: _____

_____

_____

Owner and contact name: _____

Date of commencement: _____

Date of (anticipated) completion: _____

Contract value: _____

Contractor's supervisor: _____

4.4.04 Tenderer's Senior Supervisory Staff

The Tenderer shall identify their senior supervisory staff in the spaces below.

Tenderers who have not performed work for the City within the last three (3) years shall submit with their Form of Tender a completed resume for each staff member listed hereunder outlining their experience, education, designations/certificates and continued training/education.)

Name	Position	Qualifications	# Years Experience

4.4.05 Tenderer's Plant

The Tenderer shall list below the construction plant (type of machinery, equipment, trucks, etc.) the Tenderer proposes to use, other plant under the Tenderers control, and the plant the Tenderer proposes to hire, to complete the work within the time allowed.

Type	Make	Model # & Year	Gas/ Diesel	Net Engine Horsepower	Bucket Size Excavator GVW

4.4.06 Tenderer's Other Resources

The Tenderer shall list below the batch plant, gravel pits or quarries, and the like that the Tenderer proposes to use to complete the work within the time allowed.

4.4.07 Sub-Contractors and Suppliers

Tenderers shall state the name and address of each proposed sub-contractor or supplier.

The listing of more than one sub-contractor or supplier for any one sub-trade or failure to submit a complete list of sub-contractors and suppliers may be grounds for rejection of the Tender. After the City has provided the selected Tenderer with written notification of the City's acceptance of its Tender, the selected Tenderer shall not substitute other sub-contractors or suppliers in place of those named below without the written approval of the Engineer.

Sub-Trade or Supplier	Name of Sub-Contractor/Supplier	Address

4.5 SCHEDULE OF QUANTITIES AND UNIT PRICES

The tenderer shall complete and attach as Appendix 4A the required *Schedule of Quantities and Unit Prices* for the Work tendered.

4.6 CERTIFICATE OF INDEPENDENT TENDER DETERMINATION

I, the undersigned, in submitting the accompanying Tender to The City of Saint John for:

Tender No.: _____

Title of Work: _____

_____

do hereby make the following statements that I certify to be true and complete in every respect:

I certify, on behalf of _____ that:

(Corporate Name of Tenderer)

4.6 CERTIFICATE OF INDEPENDENT TENDER DETERMINATION (Cont'd)

1. I have read and I understand the contents of this Certificate;

2. I understand that the accompanying Tender will be disqualified if this Certificate is found not to be true and complete in every respect;

3. I am authorized by the Tenderer to sign this Certificate, and to submit the accompanying Tender, on behalf of the Tenderer;

4. Each person whose signature appears on the accompanying Tender has been authorized by the Tenderer to determine the terms of, and to sign, the Tender, on behalf of the Tenderer;

5. For the purposes of this Certificate and the accompanying Tender, I understand that the word "competitor" shall include any individual or organization, other than the Tenderer, whether or not affiliated with the Tenderer, who:

(a) may submit a Tender in response to this Request for Tender;

(b) could potentially submit a Tender in response to this Request for Tender, based on their qualifications, abilities or experience;

6. The Tenderer discloses that (check one of the following only, as applicable):

☐ the Tenderer has arrived at the accompanying Tender independently from, and without consultation, communication, agreement or arrangement with, any competitor; or

☐ the Tenderer has entered into consultations, communications, agreements or arrangements with one or more competitors regarding this Request for Tender, and the Tenderer discloses, in the attached document(s), complete details thereof, including the names of the competitors and the nature of, and reasons for, such consultations, communications, agreements or arrangements.

7. In particular, without limiting the generality of paragraphs (6)(a) or (6)(b) above, there has been no consultation, communication, agreement or arrangement with any competitor regarding:

(a) prices;

(b) methods, factors or formulas used to calculate prices;

(c) the intention or decision to submit, or not to submit, a Tender; or

(d) the submission of a Tender which does not meet the specifications of the Request for Tender;

except as specifically disclosed pursuant to paragraph (6)(b) above;

4.6 CERTIFICATE OF INDEPENDENT TENDER DETERMINATION (Cont'd)

8. In addition, there has been no consultation, communication, agreement or arrangement with any competitor regarding the quality, quantity, specifications or delivery particulars of the products or services to which this Request for Tender relates, except as specifically authorized by The City of Saint John or as specifically disclosed pursuant to paragraph (6)(b) above;

9. The terms of the accompanying Tender have not been, and will not be, knowingly disclosed by the Tenderer, directly or indirectly, to any competitor, prior to the date and time of the official Tender Opening, or of the awarding of the Contract, whichever comes first, unless otherwise required by law or as specifically disclosed pursuant to paragraph (6)(b) above.

Name of Tenderer or Authorized Agent: _____

Signature of Tenderer or Authorized Agent: _____

Position Title: _____

Date: _____

Address of Tenderer: _____

_____

ATTACHMENT: TENDERER'S CHECKLIST

(The onus is entirely on the Tenderer to understand all the requirements of the tendering process and the Tender Documents. This checklist is provided for information only and is not required to be submitted with the Form of Tender.)

BEFORE SUBMITTING YOUR TENDER, CHECK THE FOLLOWING POINTS:

- ☐ Has your Tender been signed and witnessed?
- ☐ Have you sealed the *Form of Tender* with your corporate seal?
- ☐ Have you enclosed your Tender (Bid) Bond or certified cheque?
- ☐ Have you enclosed the surety consent letter?
- ☐ Have you completed all sections of the *Form of Tender*?
- ☐ Have you completed all schedules and prices in the *Form of Tender*?
- ☐ Have you written each unit price or lump sum price out in words, including the words "dollars" and "cents"?
- ☐ Have you included signed copies of all addenda signature pages?
- ☐ Have you listed your Subcontractors and suppliers?
- ☐ Have you listed your experience in similar work?
- ☐ Have you listed your senior staff?
- ☐ Have you listed the Tenderer's plant?
- ☐ Have you attached required appendices and required supplemental information?
- ☐ Are the documents complete?
- ☐ Is everything legible?

DIVISION 4 – APPENDIX 4A
SCHEDULE OF QUANTITIES AND UNIT PRICES

SHEET: 1 of 1

CONTRACT
2020-085103T

UNIT PRICE TO BE EITHER TYPEWRITTEN OR PRINTED IN INK IN WORDS AND PRINTED NUMERICALLY

Not Applicable

City of Saint John

CONTRACT SPECIFICATIONS

DIVISION 5

FORM OF AGREEMENT

City of Saint John

TABLE OF CONTENTS

DIVISION 5 – FORM OF AGREEMENT

5.1 AGREEMENT BETWEEN OWNER AND CONTRACTOR

THIS AGREEMENT made in triplicate between **THE CITY OF SAINT JOHN** herein (and in the Specifications) called the "Owner" or the “City”

AND

_____

herein (and in the Specifications) called the "Contractor".

WITNESSETH: That the Owner and the Contractor agree as follows:

(a) The Contractor shall provide all the materials and perform all the work shown on the drawings and described in the Contract Specifications titled:

Contract No: _____

Title: _____

(b) The Contractor shall do and fulfill everything indicated by this Agreement; and

(c) The Contractor shall Substantially Complete the Work no later than _____ .

5.2 CONTRACT DOCUMENTS

5.2.01 General Specifications

General Specifications, City of Saint John, New Brunswick,
with all applicable divisions, as updated and as listed in the Table of Contents of the Contract Specifications.

5.2.02 Contract Specifications

Contract specifications for

Contract No: _____

Title: _____

City of Saint John, New Brunswick,

5.2.03 Drawings

5.3 ADDENDA

The Contractor agrees that he has received addenda ___ to ___ inclusive, and that the tender price includes the provisions set out in the addenda.

5.4 CONTRACT PRICE

The Owner shall pay to the Contractor, in lawful money of Canada for the performance of the Contract, the amounts determined for each of the items of work completed at the unit prices as listed in the Schedule of Quantities and Unit Prices, submitted with the tender, which is to be attached with this Agreement, for the total tender price of:

_____

_____

_____(Excluding HST)_____

If the Engineer orders in writing the performance of any work not covered by the drawings or included in the specifications that cannot be classified as coming under any of the contract units and for which a unit price can be agreed upon, then such additional work shall be paid for as described under the General Administration of Contract, Division 6.

5.5 PAYMENT

The Owner shall pay on account of thereof upon the Engineer's Certificate, as invoiced by the Contractor and approved by the Engineer, in the manner described in the Specifications.

5.6 AGREEMENT DOCUMENTS

The General Administration of Contract, Division 6 and the aforesaid Specifications and Drawings are all to be read into and form part of this Agreement and the whole shall constitute the Contract between the parties and it shall inure to the benefit of and be binding upon them and their successors, executors, administrators, and subject to the General Administration of Contract, their assigns.

5.7 EXECUTION OF AGREEMENT

In Witness Whereof the parties hereto have executed this Agreement.

	) SIGNED, SEALED AND DELIVERED)) this _____ day of _____, _____)) by _____) (Contractor))
_____ (Witness)	) _____) (Signature))
_____ (Name and Title)	) _____) (Name and Title))
	) _____) (Signature))
	) _____) (Name and Title)))) *PLACE SEAL HERE*

	))) SIGNED, SEALED AND DELIVERED)) this _____ day of _____, _____)) by THE CITY OF SAINT JOHN.))) _____) MAYOR)) _____) COMMON CLERK)))) *PLACE SEAL HERE*

5.8 AFFIDAVIT OF CORPORATE EXECUTION

CANADA
PROVINCE OF NEW BRUNSWICK
CITY OF SAINT JOHN
I, _____, of the _____
in the County of _____, and Province of New Brunswick
MAKE OATH AND SAY:

(1) THAT I am the _____ of _____, and _____ is the _____ of the said Company, as such I am/we are duly authorized officer(s) of the said Company to execute the foregoing instrument.

(2) THAT the signature _____ subscribed to the within instrument is my signature and in my own proper handwriting and that the signature _____ so subscribed is his signature made thereto by him in my presence.

(3) THAT the Seal affixed to the said instrument purporting to be the Corporate Seal of the said _____ is the Corporate Seal of the said Company and was affixed to the said instrument by me and by order of the Board of Directors of the Company.

SWORN TO BEFORE ME at the_____)
)
of _____)
)
in the Province of _____)
)
this _____ day of _____ A.D., _____.)
)
_____) _____
COMMISSIONER OF OATHS) CONTRACTOR
)

Note: The blank spaces are to be filled in with the name or names of the signing officer(s).

5.9 CHECKLIST FOR INSURANCE REQUIREMENTS

The insurance coverage required by the City is set out in General Administration of Contract, Division 6, of the General Specifications. An Insurance Certificate is to be deposited with the City.

The certificate of insurance should contain at least the following information:

- ❑ Be addressed to the City of Saint John.
- ❑ Be signed by an authorized representative on behalf of the insurance company.
- ❑ Contain a Wrap-up (Project Specific) Liability policy with inclusive limits of at least five million dollars ($5,000,000.00).
- ❑ Show that the City of Saint John, the Contractor and Sub-Contractors, the Engineer and the Architect, are added as Additional Insured with respect to the operations of the Contractor.
- ❑ Confirm coverage for bodily injury and property damage and set forth the amount.
- ❑ Confirm that there is coverage for Contractual Liability with respect to this Contract.
- ❑ Confirm that the policy contains a cross liability clause.
- ❑ Confirm that there is Contingent Employer's Liability Coverage.
- ❑ Confirm that there is coverage for Broad Form Property Damage.
- ❑ Confirm that there is Completed Operations coverage with respect to this contract and that such coverage shall continue to be in force for the duration of the guarantee period (maintenance period) which is a period of twelve (12) months from the date of issuance of the Certificate of Final Completion.
- ❑ Confirm that there is coverage for Non-Owned Automobiles or licensed vehicles.
- ❑ Confirm that there is coverage for Owned Automobiles or licensed vehicles.
- ❑ Confirm that the indicated policies will not be cancelled, substantially amended, or allowed to lapse without the City first being given a thirty (30) day written notice.