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Iqaluit

REQUEST FOR QUOTATION
FOR THE PROVISION OF

CONSTRUCTION SERVICES FOR

ARNAITOK ARENA IMPROVEMENTS

BID CALL: JULY 20, 2022

QUOTATIONS DUE: AUGUST 4, 2022, at 3:00 PM EST

2022-RFQ-137

Receipt Confirmation Schedule

To: City of Iqaluit – Engineering and Capital Projects
Attention: Sumon Ghosh
Title: Director, Engineering and Capital Projects
Address: 901 Nunavut Drive
P.O Box 460
Iqaluit, Nunavut, X0A 0H0
Fax: 867-979-5653
Email: s.ghosh@iqaluit.ca

Bidders are requested to acknowledge receipt of 2022-RFQ-137 and their intent to submit a Quotation by sending this Receipt Confirmation Schedule by email to the attention of the RFQ Coordinator. Bidders submitting this Receipt Confirmation Schedule will be notified of any addendum issued to this RFQ, which will be forwarded to the person whose name is identified.

I hereby acknowledge receipt of this above-noted RFQ.

(Please check your answer)

I / We DO ☐ NO NOT ☐ Intend to submit a Quotation to this RFQ.

Representative's contact information:

Name	Representative's Signature
Address	Name – Please Print
City, Province/ Territory, Postal Code	Title
Phone	Email
Date	

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PART 1 INTRODUCTION

1.1 Rules of Interpretation

This RFQ shall be interpreted according to the following provisions, unless the context requires a different meaning:

a) Unless the context otherwise requires, wherever used herein the plural includes the singular, the singular includes the plural, and each of the masculine and feminine includes the other gender.

b) Words in the RFQ shall bear their natural meaning unless otherwise expressly defined.

c) In construing the RFQ, general words introduced or followed by the word *other* or *including* or *in particular* shall not be given a restrictive meaning because they are followed or preceded (as the case may be) by particular examples intended to fall within the meaning of the general words.

d) Time periods will be strictly applied.

e) The following terminology applies in the RFQ:

i. Whenever the terms *must* or *shall* are used in relation to the City of Iqaluit or the Bidder, such terms shall be construed and interpreted as synonymous and shall be construed to read *the City of Iqaluit shall* or the *Bidder shall*, as the case may be.

ii. The term “should” relates to a requirement which the City of Iqaluit would like the Bidder to address in its Quotation.

iii. The term *will* describes a procedure that is intended to be followed.

1.2 Role of the City of Iqaluit

This Request for Quotations is issued by the City of Iqaluit Purchasing Department (the “**City of Iqaluit**”) on behalf of the Department of Engineering and Capital Projects.

The purchasing organization is the City of Iqaluit. The purchasing organization will administer the RFQ process described in the RFQ for the benefit of the Purchasers.

Once a contract has been established with the successful Bidder, the project will be overseen by the City’s Project Manager. The Project Manager assigned to this project is Jared Wright.

1.3 City of Iqaluit Background

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Iqaluit is the capital of the Nunavut Territory and is located at the south end of Baffin Island near the end of Frobisher Bay. Access to Iqaluit is provided by regular scheduled commercial aircraft year-round, snowmobile trails from other Baffin Island communities in the winter, and sealift from the port of Montreal and Valleyfield in the summer.

The City is the newest Capital City in Canada and as a result has experienced a period of rapid development and growth. Iqaluit is the seat of government for the Territory of Nunavut and is the home base of many federal and territorial government departments. The City is rapidly developing into a regional center for the territory with many northern businesses in Inuit organizations making it their base of operations. The current population of Iqaluit is estimated at about 7,000 people with an average annual growth rate between three and four percent.

1.4 Products and Services

This RFQ is issued for the purpose of obtaining Quotations for construction services for the City of Iqaluit. The RFQ provides vendors with relevant information pertaining to the services required.

1.5 Objectives

The City of Iqaluit is seeking to satisfy the following objectives in issuing this RFQ:

a) Perform various architectural and mechanical upgrades within the Arnaitok Arena lobby area
b) Complete the specified work prior to the end of 2022
c) Carry out the work in coordination with the City such that the facility's operations can be kept in continuous uninterrupted operations

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PART 2 RFQ TERMS AND INSTRUCTIONS

2.1 Submission

Bidders must submit electronic (PDF) copies of their Bid(s). Emails are to be received before 3:00 PM EST on Thursday August 4, 2022, addressed to:

Sumon Ghosh
Director, Engineering and Capital Projects
City of Iqaluit
s.ghosh@iqaluit.ca

Emails should be clearly marked in the subject line the “Arnaitok Arena Improvements – 2022-RFQ-137 Quotation Submission” and the Bidders name. Bidders shall submit a Cost Submission form identifying the corresponding costs.

The total size of email submissions should be less than 5MB in size to facilitate delivery and adequate time must be allowed for delivery. It is the Bidder’s responsibility to confirm successful receipt of the email submission prior to the deadline.

The final decision on whether to accept late Quotations is at the City’s discretion.

2.2 Inquiries and Amendments

All inquiries concerning this RFQ (up until any contract award notification) are to be directed by email only to:

Jared Wright
Project Manager
Colliers Project Leaders
jared.wright@colliersprojectleaders.com

The deadline for submitting inquiries is 3:00 PM EST on Wednesday July 27, 2022.

To ensure consistency and fairness to all Bidders, all firms who have received the RFQ will receive any information with respect to significant inquiries in the form of written addenda. Verbal explanations or instructions will not be provided.

2.3 Bidder Requirements

The successful Bidder must have a valid City of Iqaluit Business License prior to contract award.

2.4 Solicitation of Council Members, City Staff and City Consultants

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Bidders and their agents will not contact any member of the City Council, City Staff or City Consultants with respect to this RFQ, other than the RFQ Coordinator named in Section 2.2, at any time prior to the award of a contract or the cancellation of this RFQ.

2.5 Terms and Conditions

2.5.1 Submission of a Bid constitutes acknowledgement that the Bidder has read and agrees to be bound by all the terms and conditions of this RFQ.

2.5.2 The City will not make any payments for the preparation of a response to this RFQ. All costs incurred by a Bidder will be borne by the Bidder.

2.5.3 This is not an offer. The City does not, by virtue of this Bid call, commit to an award of a Bid, nor does it limit itself to accepting the lowest price or any Bid submitted, but reserves the right to award this Bid in any manner deemed to be in the City's best interest.

2.5.4 The City has the right to cancel this RFQ at any time and to reissue it for any reason whatsoever, without incurring any liability and no Bidder will have any claim against the City as a result of the cancellation or reissuing of the RFQ.

2.5.5 A Bidder may withdraw its Quotation only by providing written notice to the RFQ Coordinator before the RFQ Submission Deadline. A Quotation may not be withdrawn after the RFQ Submission Deadline. The City of Iqaluit has no obligation to return withdrawn Quotations.

2.5.6 A Bidder may amend its Quotation after submission, but only if the Quotation is amended and resubmitted before the RFQ Submission Deadline. The Bidder must provide notice to the RFQ Coordinator in writing and replace its Quotation with a revised Quotation, in accordance with the requirements of this RFQ. The City of Iqaluit has no obligation to return amended Quotations.

2.5.7 The City will not be responsible for any Bid that does not indicate the RFQ reference, and the Bidder's name.

2.5.8 The City will not be responsible for any Bid that is delivered to any address or in any manner other than that provided in Section 2.1 of this RFQ.

2.5.9 If a contract(s) is to be awarded as a result of this RFQ, it will be awarded to the Bidder whose Bid for each service, in the City's opinion, provides the best potential value to the City and is capable in all respects to perform fully the contract requirements and has the integrity and reliability to assure performance of the contract obligations.

2.5.10 If the City decides to award a contract(s) based on a submission received in response to this RFQ, the Successful Bidder(s) will be notified of the intent to award in writing, and the subsequent execution of a written agreement shall constitute the making of a

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Contract. Bidders will not acquire any legal or equitable rights or privileges whatsoever until a Contract is signed by both parties.

2.5.11 In the event of any inconsistency between this RFQ, and any ensuing Contract(s), the Contract shall govern.

2.5.12 Any Contract(s) will be in the form of the City's standard "City of Iqaluit Services Agreement" and it will contain the relevant provisions of this RFQ, the accepted Bid as well as such other terms as may be mutually agreed upon, whether arising from the accepted Bid or as a result of any negotiations prior or subsequent thereto. The City reserves the right to negotiate modifications with any Bidder who has submitted a Bid.

A copy of the Services Agreement is included as Appendix A.

2.5.13 Any amendment made by the City to the RFQ will be issued in writing and sent to all who have received the documents via addenda.

2.5.14 An Evaluation Committee will review each Bid. The City reserves the exclusive right to determine the qualitative aspects of all Quotations relative to the evaluation criteria.

2.5.15 Quotations will be evaluated as soon as practicable after the closing time. No detail of any Bid will be made public except the names of all parties submitting Quotations.

2.5.16 Bidders must acknowledge receipt of any addenda issued by the City in their Bid.

2.5.17 Every Bidder shall carefully review the RFQ to ensure that it has no reason to believe there are any uncertainties, inconsistencies, errors, omissions, or ambiguities in any part of the RFQ. Every Bidder is responsible for conducting its own investigations and due diligence necessary for the preparation of its Quotation.

2.5.18 In the event a Bidder has any reason to believe that any of the circumstances listed in Section 2.5.17 exist, the Bidder shall notify the RFQ Coordinator in writing prior to submitting a Quotation. The RFQ Coordinator will then clarify the matter for the benefit of all Bidders.

2.5.19 Bidders shall not:

a) After submission of a Quotation, claim that there was any misunderstanding or that any of the circumstances set out in 2.5.17 were present with respect to the RFQ; or

b) Claim that the City of Iqaluit is responsible for any of the circumstances listed in Section 2.5.17.

2.5.20 By submitting a Quotation, the Bidder confirms that all of the components required to use and/or manage the Services have been identified in its Quotation or will be provided to the City of Iqaluit at no additional charge. Any requirement that may be

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identified by the Bidder after the RFQ Submission Deadline or subsequent to signing the Agreement shall be provided at the Bidder's expense.

2.6 Clarification of Bidder's Quotation

The City of Iqaluit shall have the right at any time after the RFQ Submission Deadline to seek clarification from any Bidder in respect of that Bidder's Quotation. The City of Iqaluit shall not be obliged to seek clarification of any aspect of any Quotation.

Any clarification sought shall not be an opportunity for the Bidder to either correct errors or to change the Bidder's Quotation in any substantive manner. Subject to the qualification in this provision, any written information received by the City of Iqaluit from a Bidder in response to a request for clarification from the City of Iqaluit may be considered to form an integral part of the Bidder's Quotation, in the City of Iqaluit's sole discretion.

2.7 Verification of Information

The City of Iqaluit shall have the right, in its sole discretion, to:

a) Verify any Bidder's statement or claim made in the Bidder's Quotation or made subsequently in an interview, site visit, oral presentation, demonstration, or discussion by whatever means the City of Iqaluit may deem appropriate, including contacting persons in addition to those offered as references;

b) reject any Bidder's statement, claim or Quotation, if such statement, claim or Quotation is patently unwarranted or is questionable; or

c) access the Bidder's premises where any part of the work is to be carried out to confirm Quotation information, quality of processes, and to obtain assurances of viability, provided that, prior to providing such access, the Bidder and City of Iqaluit shall agree on reasonable access terms, including pre-notification, extent of access, security, confidentiality and the allocation and amount of any costs incurred in connection with such access.

The Bidder shall co-operate in the verification of information and is deemed to consent to the City of Iqaluit verifying such information.

2.7 Validity of Offer

Quotations shall remain open for acceptance for a period of not less than sixty calendar (60) days from the closing date of this RFQ.

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PART 3 BID REQUIREMENTS AND EVALUATION

3.1 Quotation Format

3.1.1 General

The Bidder's Quotation should be comprised and formatted as follows:

a) One (1) electronic copy of a fully executed unqualified Cost Submission Form (PDF format), titled "Cost Submission Form – Arnaitok Arena Improvements".

3.1.2 Legal Actions

The Bidder shall disclose any pending or threatened legal action against the Bidder or by the Bidder against any third party that may have an impact on the availability of the Services proposed by the Bidder.

3.1.3 Declaration and Certification

The Bidder shall complete the Declaration and Certification Schedule in accordance with the instructions contained in that schedule.

3.1.4 Cost Submission Form

The Bidder shall complete the Cost Submission Form in accordance with the instructions contained in that schedule, provided that the following shall apply:

a) All prices shall be provided in Canadian funds and shall include all applicable customs duties, tariffs, overhead, permits, licenses, labour, carriage insurances, and warranties, and further shall not be subject to adjustment for fluctuation in foreign exchange rates. All prices shall be quoted exclusive of the goods and services taxes (GST);

b) The Quotation submitted for the services requested will be based on a fixed fee.

c) All prices quoted, unless otherwise instructed in this RFQ, shall remain firm for the period set out in the RFQ;

d) All prices quoted MUST be for units that originate from the Canadian marketplace. No "Grey Market" product pricing will be accepted.

e) Travel and accommodation expenses shall not be included in the rates quoted and shall be billed separately and charged in accordance with the applicable Purchaser's policy, as may be amended from time to time. Original itemized receipts are required for reimbursement. Meals, hospitality, and other incidentals shall not be included in eligible expenses;

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f) In the event of any discrepancy in the pricing, the lowest unit price submitted shall prevail; and

g) The Bidder is deemed to confirm that it has prepared its Quotation with reference to all of the provisions, and that it has factored all of the provisions of the Agreement into its pricing assumptions, calculations and into its proposed Pricing.

3.2 Evaluation Process

The City will appoint an Evaluation Committee for the purpose of evaluating Quotations. Quotation evaluations will follow a two-step process:

a) Validation of mandatory requirements;

b) Financial evaluation;

Quotations that do not meet the mandatory requirements will not be considered further.

3.3 Mandatory Requirements

Bidders must satisfy the following mandatory requirements in their Quotation in accordance with the requirements of this RFQ. Bidders shall submit the following:

a) Fully executed and unconditional Cost Submission Form.

b) Initials of acknowledgement on all RFQ pages (located on the bottom of each page).

3.4 Financial Evaluation

The Bidder who submits a Quotation with the lowest compliant financial offer will be successful as part of the financial evaluation.

3.5 RFQ Schedule

The following is a summary of the key dates in the RFQ process and the Works:

***Table 1** – RFP Process Schedule*

Milestone	Date
RFQ Issue Date	July 20, 2022
Last Day for Bidder to Submit Questions	July 27, 2022, 3:00:00 PM local Iqaluit time
Last Date for Addenda to be Issued	July 28, 2022, 3:00:00 PM local Iqaluit time

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RFP Submission Deadline	August 4, 2022, 3:00:00 PM local time
Anticipated Contract Award Date	August 25, 2022
Anticipated Project Start/ Kick-Off Meeting	September 5, 2022
Substantial Completion	November 30, 2022

3.6 Terms of Payment

The Bidder shall be reimbursed monthly for works completed for each service provided. Invoices are to be submitted on a monthly basis, and shall include:

- the project title.
- the service contract number.
- a description of the work completed.
- billing summary, which includes the tasks as set forth in the costing submission, the proposed costs, cost to date, percentage invoiced to date, and the percentage of work completed to date for each task.
- backup for all disbursements (time sheets may be requested).

The monthly invoice should be reviewed as a draft by the City's Project Manager in order to validate the fee and services being claimed. The Bidder is to update the invoice (as required), as per comments/ feedback received from the City's Project Manager. The City's Project Manager and Bidder are to determine at the Project Kick-Off meeting the date which draft monthly invoices are to be reviewed.

The final invoice is to be submitted to the City's Project Manager for processing with the City. Invoices that are issued directly to the City's Accounts Payable Department will not be processed. Final invoices must be submitted for payment by the 10th of every month, for previous months work (e.g. invoice must be submitted by February 10th for work completed up to January 31st), or on the next corresponding business day if the 10th lies on a holiday or weekend.

No payment will be made for the cost of work incurred to remedy errors or omissions for which the contractor is responsible. No additional invoicing will be accepted above and beyond what the City has agreed to as per the contract. At no time shall the contract upset limit be exceeded without prior written authorization from the City.

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PART 4 SCOPE OF WORK

4.1 Scope of Work

The Bidder will be responsible for all materials, labour, and equipment required to execute the scope of work. The following provides a general description of the Scope of Work for the project, however the execution requirements for all construction and installation activities are shown within the attached drawings and specifications.

1. Replacement of flooring and baseboards in lobby area, men's washroom, and women's washroom
2. Fabrication, supply, and installation of various millwork benches and feature walls within the lobby area
3. Supply and application of paint in various locations
4. Replacement of washroom plumbing fixtures
5. Replacement of washroom counters and vanities
6. Replacement of washroom partitions
7. Demolition of all existing conditions required to perform the specified improvements
8. Miscellaneous architectural minor repairs throughout lobby and washroom areas

Prior to beginning the work, the contractor must provide a project schedule for City approval. It is possible that the contractor may need to perform the work during multiple mobilization phases at the request of the City in order to meet the arena activity's schedule requirements. These efforts are to be included within the fixed fee pricing.

Prior to beginning the work, the contractor must submit all technical submittals and shop drawings specified within the contract documents. All submittals and shop drawings must be approved prior to completing the work.

In addition to the project schedule, the contractor must provide at least 3 days' notice before each scope activity is planned to take place and provide the work plan, work protection plan and measures, and expected hours and duration of work so that the City can coordinate the arena activities accordingly. The City reserves the right to reject the contractor's notice if the arena schedule cannot accommodate the proposed timing, and the contractor must submit a new notice with updated details.

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COST SUBMISSION FORM

The Bidder should use the following charts to respond to the Part 4 Scope of Work requirements. "Table 1: Cost Submission Form" will be used for the evaluation of the RFQ. Bidders must also complete "Table 2: Provisional Items Cost Form", as these items may also be included in the scope.

Bidder Name _____

Table 1: Cost Submission Form

No.	Item/ Description	Qty	Unit	Unit Price	Total
1.	Mobilization, demobilization, site setup, project management, coordination, administration, meetings	1	LS	$	$
2.	Lobby – replacement of flooring and baseboard, including all labour, materials, demolition, preparation, and shipping	1	LS	$	$
3.	Lobby – bench, wall, and counter millwork, including all labour, materials, demolition, preparation, and shipping	1	LS	$	$
4.	Lobby – miscellaneous painting, including all labour, materials, demolition, preparation, and shipping	1	LS	$	$
5.	Lobby – all other miscellaneous architectural improvements	1	LS	$	$
				SUBTOTAL (items 1-5):	**$**
				Applicable Taxes (GST):	$
				TOTAL (Incl. GST):	**$**

Table 2: Provisional Items Cost Form

No.	Item/ Description	Qty	Unit	Unit Price	Total
1.	Women's washroom – replacement of flooring and baseboard, including all labour, materials, demolition, preparation, and shipping	1	LS	$	$
2.	Men's washroom – replacement of flooring and baseboard, including all labour, materials, demolition, preparation, and shipping	1	LS	$	$
3.	Women's washroom – replacement of vanity and other localized work, including all labour, materials, demolition, preparation, and shipping	1	LS	$	$
4.	Men's washroom – replacement of vanity, mechanical fixtures and other localized architectural and mechanical work, including all	1	LS	$	$

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	labour, materials, demolition, preparation, and shipping				
5.	Women's washroom – replacement of stall walls, doors, fixtures, and other localized architectural and mechanical work, including all labour, materials, demolition, preparation, and shipping	1	LS	$	$
6.	Men's washroom – replacement of stall walls, doors, fixtures, and other localized architectural and mechanical work, including all labour, materials, demolition, preparation, and shipping	1	LS	$	$
7.	Grout repair including all labour, materials, demolition, preparation, and shipping (cash allowance, final quantity to be confirmed upon mobilization)	3	Lin.m.	$	$

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UNFAIR ADVANTAGE AND CONFLICT OF INTEREST STATEMENT SCHEDULE

In the event that the boxes below are left blank, the Bidder shall be deemed to declare that (a) it has had no Unfair Advantage in preparing its Quotation and (b) there is no foreseeable actual or potential Conflict of Interest in performing the contractual obligations contemplated in the RFQ.

If either or both of the statements below apply, check the appropriate box:

☐ The Bidder declares that there is an actual or potential Unfair Advantage relating to the preparation of

☐ The Bidder declares that there is an actual or potential Conflict of Interest in performing the contractual obligations contemplated in the RFQ.

In the event the Bidder declares an actual or potential Unfair Advantage and/or an actual or potential Conflict of Interest (by marking either of the boxes above), the Bidder shall provide all relevant detailed information below.

_____

_____

_____

_____

_____

The Bidder agrees to provide any additional information which may be requested by the RFQ Coordinator, in the form prescribed by the RFQ Coordinator.

Where, in its sole discretion, the City of Iqaluit concludes that an Unfair Advantage and/or Conflict of Interest arises, it may, in addition to any other remedy available to it at law or in equity, disqualify the Bidder's Quotation, or terminate any Agreement awarded to the Bidder under the RFQ.

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DECLARATION AND CERTIFICATION SCHEDULE

TO: **City of Iqaluit**

RE: In the matter of our Quotation dated [*insert*] to which this Declaration and Certification Schedule is an integral part the Quotation prepared by [*insert*] and submitted in response to a Request for Quotations issued by the City of Brockville dated [Insert] as amended, regarding the selection of a Bidder to execute the Agreement pursuant to the RFQ.

I am duly authorized by the Bidder, including the persons, firms, corporations, and advisors joining in the submission of this Quotation, to execute this Declaration and Certification Schedule. I solemnly declare and certify as follows:

1. Bidder Information

a) The full legal name of the Bidder is:

_____
_____
_____

b) Any other registered business name under which the Bidder carries on business is:

_____
_____
_____

c) The jurisdiction under which the Bidder is formed is:

_____
_____
_____

d) The name, address, telephone number, and email address of the contact person for the Bidder:

_____
_____
_____

2. Offer

The Bidder has carefully examined the RFQ documents and has a clear and comprehensive knowledge of what is required under the RFQ. By submitting its Quotation, the Bidder agrees and consents to the terms, conditions, and provisions of the RFQ, except as otherwise noted, and offers to provide the Services in accordance therewith at the Rates set out in the Cost Submission Form.

3. Pricing

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The Bidder has submitted its Pricing in accordance with the instructions in the RFQ and in the form set out in the Cost Submission Form.

4. Quotation Irrevocable

The Bidder agrees that its Quotation shall be irrevocable for 60 calendar days following the Quotation RFQ Submission Deadline.

5. Disclosure of Information

The Bidder hereby agrees that any information provided in this Quotation, even if it is identified as being supplied in confidence, may be disclosed where required by law or if required by order of a court or tribunal. The Bidder hereby consents to the disclosure, on a confidential basis, of its Quotation to the City of Iqaluit's advisors retained for the purpose of evaluating or participating in the evaluation of this Quotation.

6. Proof of Insurance and Good Standing Under the Workers' Safety Compensation Commission

By signing this Declaration and Certification Schedule, the Bidder agrees, if selected, that it has verified its capability to do so and will provide proof of insurance coverage and a Certificate of Good Standing under the Workers' Safety Compensation Commission (Nunavut).

7. Execution of Agreement

If its Quotation is selected by the City of Iqaluit, the Bidder agrees to finalize and execute the Agreement in accordance with the terms of the RFQ.

Signature of Witness	Signature of Bidder Representative, who has authority to bind the Bidder
Name of Witness	Name and Title of Representative, who has authority to bind the Bidder
	Date

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APPENDIX A – CITY OF IQALUIT SERVICE AGREEMENT

BETWEEN: THE MUNICIPAL CORPORATION OF THE CITY OF IQALUIT

(hereinafter referred to as the "CITY OF IQALUIT")

OF THE FIRST PART

AND: . **<CONTRACTOR NAME>**

(hereinafter referred to as the "Contractor")

OF THE SECOND PART

WHEREAS the CITY OF IQALUIT has requested the Contractor to provide **<description of services>;**

AND WHEREAS the Contractor has agreed to provide such services to the CITY OF IQALUIT in its bid dated **<Bid Submission Date>**;

AND WHEREAS the CITY OF IQALUIT and the Contractor wish to set out the terms and conditions relating to the provision of such services;

THEREFORE, the CITY OF IQALUIT and the Contractor agree as follows:

1. SERVICES AND PAYMENT

1.1 The Contractor agrees to provide to the CITY OF IQALUIT those services set out in the job description and scope of work provided on **<RFT Date>**. A copy of the bid is attached as Appendix "A".

1.2 The CITY OF IQALUIT agrees to pay for the services described above, a total amount not greater than **<Bid Value>,** for the provision of professional services based on the Bid dated **<Bid Submission Date>**.

2. TERM

2.1. This Contract shall commence on the **<Contract Commence Date>** and terminates on the **<Contract Termination Date>** unless otherwise terminated in accordance with the provisions of this Contract.

3. NOTICE AND ADDRESS

3.1 Any notice required to be given herein or any other communication required by this contract shall be in writing and shall be personally delivered, sent by facsimile, or posted by prepaid registered mail and shall be addressed as follows:

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i) If, to the CITY OF IQALUIT:

Amy Elgersma
Chief Administrative Officer
City of Iqaluit
P.O. Box 460
Iqaluit, NU
X0A 0H0
Fax: 979-5922

Reference:

ii) If to the Contractor at:

<Contractor Representative – Name>
<Contractor Organization Name>
<Contractor Address>

3.2 Every such notice and communication, if delivered by hand, shall be deemed to have been received on the date of delivery or if sent by prepaid registered mail shall be deemed to have been received on the seventh day after posting, or if by facsimile, 48 hours after the time of transmission, excluding from the calculation weekends and statutory holidays.

4. COMPLETE AGREEMENT

4.1 This Contract and its attachments constitute the complete Contract between the parties. Except as provided herein, it supersedes and shall take effect in substitution for all previous agreements. It is subject to change only by an instrument executed in writing by the City.

4.2 If this Contract arises from a request for proposals or tender call, the provisions of the request for proposals or tender call and the Contractor's bid or proposal submission are incorporated into this Contract and may be used to clarify, explain or supplement this Contract, but shall not be used to contradict any express terms of this Contract.

4.3 In the event of a conflict between this Contract, the Contractor's bid or proposal submission, and the City's original tender bid instructions or Request for Proposals, the more recently prepared document shall govern to the extent of such inconsistency.

5. GENERAL TERMS

5.1 Any information obtained from or concerning any department of the CITY OF IQALUIT or clients of any department of the CITY OF IQALUIT, by the contractor, its agents or employees in the performance of any contract shall be confidential. The Contractor shall take such steps as are necessary to ensure that any such information is not disclosed to any other person and shall maintain confidential and secure all material and information that is the property of the CITY OF IQALUIT and in the possession of or under the control of the Contractor. This clause survives the termination of this contract.

5.2 Time shall in every respect be of the essence. The Contractor shall deliver the services specified in the contract and according to the project schedule on costs. The CITY OF IQALUIT may grant reasonable extensions to the Contractor for delays, if the Contractor can show those delays were caused by circumstances beyond the control of the Contractor.

5.3 The Contractor is an independent Contractor with the CITY OF IQALUIT and nothing in this contract shall be construed or deemed to create the relationship of employee and employer or of principal and agent between the CITY OF IQALUIT and the Contractor. The Contractor is solely responsible for

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payments of all statutory deductions or contributions including but not limited to pension plans, unemployment insurance, income tax, workers' compensation and the Nunavut Payroll Tax.

5.4 This contract shall be interpreted and governed in accordance with the laws of Nunavut and the laws of Canada as they apply in Nunavut.

5.5 No waiver by either party of any breach of any term, condition or covenant of this contract shall be effective unless the waiver is in writing and signed by both parties. A waiver, with respect to a specific breach, shall not affect any rights of the parties relating to other or future breaches.

5.6 The failure of either party at any time to require the performance of any provision or requirement of this contract shall not affect the right of that party to require the subsequent performance of that provision or requirement.

5.7 Title to any report, drawing, photograph, plan, specification, model, prototype, pattern, sample, design, logo, technical information, invention, method or process and all other property, work or materials which are produced by the Contractor in performing the contract or conceived, developed or first actually reduced to practice in performing the contract (herein called "the Property") shall vest in the CITY OF IQALUIT and the Contractor hereby absolutely assigns to the CITY OF IQALUIT the copyright in the property for the whole of the term of the copyright. The Contractor shall not be responsible for any loss or damage suffered by the City of Iqaluit or any third parties resulting from any unauthorized use or modification of the property, errors in transmission of the property, changes to the Property by others, the consequences of design defects due to the design of others, or defects in contract documents prepared by others, and the City of Iqaluit agrees to defend, indemnify, and hold the Contractor harmless from and against all claims, demands, losses, damages, liability and costs associated therewith. Subject to the foregoing, the Property may be relied by the City of Iqaluit for design and construction work undertaken by other parties with respect to the Services provided that such parties verify the accuracy and completeness of the Property to their satisfaction.

5.8 It is intended that all provisions of this agreement shall be fully binding and effective between the parties, but in the event that any particular provision or provisions or a part of one is found to be void, voidable or unenforceable for any reason whatever, then the remainder of the agreement shall be interpreted as if such provision, provisions, or part thereof, had not been included.

5.9 This contract may be extended by the written consent of the parties.

5.10 The CITY OF IQALUIT may delegate any of its authority and undertaking pursuant to this contract to any employee or contractor the CITY OF IQALUIT by notice in writing to the Contractor.

5.11 This contract shall enure to the benefit of and be binding on the respective administrators, successors and assignment of each of the parties hereto.

6. CONTRACTOR RESPONSIBILITIES

6.1 The Contractor shall indemnify and hold harmless, the CITY OF IQALUIT, its officers, employees, servants and agents from and against all claims, actions, causes of action, demands, losses, costs, damages, expenses, suits or other proceedings by whomsoever made, brought or prosecuted in any manner based upon or related to the negligent acts, errors, or omissions of the Contractor under this contract.

6.2 The Contractor shall be liable to the CITY OF IQALUIT for any loss or damage to property or equipment that is supplied to or placed in the care, custody or control of the Contractor for use in connection with the contract if such loss or damage is attributable to the negligence or deliberate acts of the Contractor or its employees or agents.

INITIALS _____

6.3 If, in the opinion of the CITY OF IQALUIT acting reasonably, the Contractor is in default in respect of any obligation of the Contractor hereunder, the CITY OF IQALUIT may rectify such default and pursue a claim against the Contractor for any direct costs associated with any such remediation, including a reasonable allowance for the use of the CITY OF IQALUIT's own employees or equipment.

6.4 The Contractor may not assign or delegate work to be done under this contract, or any part thereof, to any other party without the written consent of the CITY OF IQALUIT. In the case of a proposed assignment of monies owing to the Contractor under this contract, the consent in writing of the CITY OF IQALUIT must be obtained.

6.5 The Contractor shall keep proper accounts and records of the services for a period of 3 years after the expiry or termination of this agreement. At any time during the term of this contract or during the three years following the completion or termination of this agreement, the Contractor shall produce copies of such accounts and records upon the written request of the CITY OF IQALUIT.

6.6 The Contractor shall notify the CITY OF IQALUIT immediately of any claim, action, or other proceeding made, brought, prosecuted or threatened in writing to be brought or prosecuted that is based upon, occasioned by or in any way attributable to the performance or non-performance of the services under this contract.

6.7 If at any time the Contractor considers their estimates indicate costs will exceed the project budget they will immediately advise the City of Iqaluit. If in the opinion of the City of Iqaluit, acting reasonably, the excess is due to design, costs factors or matters under the control or reasonably foreseeable by the Contractor, the CITY OF IQALUIT may require the Contractor to do everything by way of revision of the design to bring the cost estimate within the project budget. Costs of completing such revisions shall be based upon a level of compensation reasonably appropriate to the circumstances, including the reason for the revisions.

6.8 Except as required in the performance of services set out in this agreement, the Contractor must maintain as confidential all data and information made available to the Contractor, the CITY OF IQALUIT, or any other parties which is generated by or results from the Contractor's performance of the Services described in this Contract. All such data and information is the property of the City of Iqaluit. This clause shall survive the termination of the Contract.

7. TERMINATION

7.1 The CITY OF IQALUIT may terminate this contract at any time upon giving written notice to this effect to the Contractor if, in the opinion of the CITY OF IQALUIT, the Contractor is unable to deliver the service as required, the Contractor's performance of work is persistently faulty, in the event that the Contractor becomes insolvent or commits an act of bankruptcy, in the event that any actual or potential labor dispute delays or threatens to delay timely performance of the contract or the (Contractor's Sub-Contractor) defaults or fails to observe the terms and conditions of the contract in any material respect.

7.2 This contract shall terminate as of the day for termination set out in the written notice and the Contractor shall forthwith invoice the CITY OF IQALUIT for work performed to the date of termination.

7.3 Any invoice submitted by the Contractor pursuant to clause 7.2 shall be reviewed by the CITY OF IQALUIT to assess the amount which is properly due and owing for work done by the Contractor prior to termination.

8. FINANCIAL

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a. The CITY OF IQALUIT, having given written notice of a breach, may withhold or hold back in whole or in part any payment due the Contractor without penalty, expense or liability, if in the opinion of the Contracting Authority, the Contractor has failed to comply with or has in any way breached an obligation of the Contractor. Any such hold back shall continue until the breach has been rectified to the satisfaction of the CITY OF IQALUIT.

8.2 The CITY OF IQALUIT may set off any payment due the Contractor against any monies owed by the Contractor to the CITY OF IQALUIT.

8.3 The City of Iqaluit will pay the Goods and Services Tax (GST).

8.4 Provided all terms and conditions on the part of the Contractor have been complied with, each invoice will be paid thirty (30) calendar days after receipt of the invoice, or thirty (30) calendar days after delivery of the services, whichever is later.

8.5 The CITY OF IQALUIT may, in order to discharge lawful obligations or to satisfy lawful claims against the Contractor or a Sub-Contractor arising out of the execution of work, pay any amount, which is due and payable to the Contractor under the contract, if any, directly to the obligee of and the claimants against the Contractor or Sub-Contractor.

9. INSURANCE AND LIABILITY

9.1 The Contractor's liability to the City of Iqaluit for claims arising out of this Agreement, or in any way relating to the Services, will be limited to direct damages and to the re-performance, without additional compensation, of any Services not meeting a normal professional standard of care and such liability will, in the aggregate, not exceed the amount of $1,000,000.00. The limitations of liability will apply, to the extent permitted by law, whether Contractor's liability arises under breach of contract or warranty; tort, including negligence; strict liability; statutory liability; or any other cause of action, and will extend to and include Contractor's directors, officers, employees, insurers, agents and sub-contractor.

9.2 In no event will either party be liable to the other party for indirect or consequential damages including without limitation loss of use or production, loss of profits or business interruption.

9.3 The Contractor shall, without limiting his obligations or liabilities hereto, obtain, maintain and pay for during the period of this agreement, the following insurance with limits not less than those shown:

a) Workers' Compensation insurance covering all employees engaged in the work in accordance with the statutory requirements of the Territory or Province having jurisdiction over such employees. If the Contractor is assessed any additional levy, extra assessment or super-assessment by a Workers' Compensation Board as a result of an accident causing injury or death to an employee of the Contractor or any sub-contractor, or due to unsafe working conditions, then such levy or assessment shall be paid by the Contractor at its sole cost and is not reimbursed by the CITY OF IQALUIT.

b) Employer's liability insurance with limits not less than $500,000 for each accidental injury to or death of the Contractor's employees engaged in the work. If Workers' Compensation insurance exists, then in such event, the aforementioned Employer's Liability insurance shall not be required but the Comprehensive General Liability policy referred to in item (d) herein shall contain an endorsement providing for Contingent Employers' Liability insurance.

c) Motor Vehicle, water craft and snow craft standard liability insurance covering all vehicles and/or craft owned or non-owned, operated and/or licensed by the Contractor and used by the Contractor in the performance of this agreement in an amount not less than one million dollars ($1,000,000.00) per occurrence for bodily injury, death and damage to property; and with respect to busses limits of not less than one million dollars ($1,000,000.00) for vehicle hazards and not

INITIALS _____

less than one million dollars ($1,000,000.00) for Bodily Injury to or death of one or more passengers and loss of or damage to the passengers property in one accident.)

d) Comprehensive General Liability Insurance with limits of not less than $1,000,000 (inclusive) per occurrence for bodily injury, death and damage to property including loss of use thereof. Such insurance shall include but not be limited to the following terms and conditions:

- Products & Completed Operations Liability *
- Contractor's Protective Liability
- Blanket Contractual Liability
- Broad Form Property Damage
- Personal Injury Liability
- Cross Liability
- Medical Payments
- Non-owned Automobile Liability *
- Contingent Employers Liability *
- Employees as Additional Insureds *

**WHERE APPLICABLE*

e) Professional Liability Insurance with limits of not less than two hundred fifty thousand dollars ($250,000.00) per claim and five hundred thousand dollars ($500,000.00) in the annual aggregate, to cover claims arising out of the rendering of or failure to render any professional service under this contract or agreement.

All policies shall provide that thirty days written notice be given to the CITY OF IQALUIT prior to any cancellations of any such policies.

The Comprehensive General Liability Insurance policies shall name the CITY OF IQALUIT and any permitted sub-contractor's as additional insureds only with respect to the terms of this contract and shall extend to cover the employees of the insureds hereunder.

The Contractor shall be responsible for any deductibles, exclusions and/or insufficiency of coverage relating to such policies.

The Contractor shall deposit with the CITY OF IQALUIT prior to commencing with the work a certificate of insurance evidencing the insurance(s) required by this clause in a form satisfactory to the CITY OF IQALUIT and with insurance companies satisfactory to the CITY OF IQALUIT.

IN WITNESS WHEREOF the parties hereto have set their hand as of the date and year entered below.

FOR THE CITY OF IQALUIT: FOR THE CONTRACTOR:

INITIALS _____

_____	_____
Name/Title	Name/Title
_____	_____
Signature	Signature
_____	_____
Date	Date
_____	_____
Witness	Witness

END OF APPENDIX A

INITIALS _____

SPECIFICATIONS

FOR

ARNAITOK ARENA RENOVATIONS
CITY OF IQALUIT
IQALUIT, NU

ISSUED FOR TENDER

Project No.: 1900641
Date: 12-JUL-22

PART 1 GENERAL

1.1 Description of Work

.1 The work will be carried out within the Arnaitok Arena and Fire Hall complex in Iqaluit, NU. It will include selective demolition, interior renovation, concrete slab replacement and associated mechanical, plumbing, HVAC and electrical modifications and additions.

.2 The work of this contract includes the provision of all materials, labour, equipment, and ancillaries, all as necessary for the completion of the work as indicated on the drawings and as described in the specifications and notes. Work on this project consists generally of, but is not limited to, the following:

- .1 Demolitions of interior spaces, partitions and associated systems and equipment.
- .2 Renovation and repairs of Arena Washroom, Lobby and Locker Rooms
- .3 Provision of new washroom fixtures and related piping.
- .4 Provision of new cabinet heaters.
- .5 Replacement of existing concrete slab in Zamboni room.
- .6 Provision of new ice melting pit c/w pump pump, heating and associated piping and services.
- .7 All other labour, materials and work necessary to complete the project to the Owners's full satisfaction.

.3 All work to be carried out in accordance with applicable federal and territorial regulations for those agencies having jurisdiction for the work. The work is subject to the Canadian Environmental Protection Act, Canada Labour Code and the NU Occupational Health and Safety Act and Regulations.

.4 The Contractor is advised that other construction work may be being performed by others at different locations within the building during the time frame of this contract. Contractor is to cooperate with other contractors within the project limits.

1.2 Work Restrictions

.1 The Contractor is limited to working within the contract limits and lay down areas shown on the

drawings. The Contractor must acquire all necessary Clearing Permits and Construction Permits which must be approved by the Owner. Work beyond these limits is prohibited unless otherwise directed by the Owner.

1.3 Familiarization With Site

.1 Before submitting a bid, it is recommended that bidders visit the site to review and verify the form, nature and extent of the work, materials needed, the means of access and the temporary facilities required to perform the Work.

.2 Obtain prior permission from the Owner before carrying out such site inspection.

.3 Contractors, bidders or those they invite to site are to review specification Section 01 35 29 – Health and Safety Requirements before visiting site. Take all appropriate safety measures for any visit to site, both before and after acceptance of bid.

1.5 Maintenance of Work During Construction

.1 Maintain work during construction. Undertake continuous and effective maintenance work day by day, with adequate equipment and forces so that the water main, sewer main, services, structures, clearing limits and roads are continuously kept in a condition satisfactory to the Departmental Representative.

1.6 Codes and Standards

.1 Materials and workmanship must conform to or exceed applicable standards of Canadian General Standards Board (CGSB), Canadian Standards Association (CSA), American Society for Testing and Materials (ASTM) and other standards organizations.

.2 Conform to latest revision of any referenced standard as re-affirmed or revised to date of specification. Standards or codes not dated shall be deemed editions in force on date of tender advertisement.

1.7 Documents Required

.1 Maintain at job site, one copy each of following:
.1 Contract drawings.
.2 Specifications.

.3 Addenda.
.4 Reviewed drawings.
.5 Change orders.
.6 Other modifications to Contract.
.7 Copy of approved work schedule.
.8 Approved Permits.
.9 Field test reports.
.10 Manufacturer's installation and application instructions.
.11 Site specific Health and Safety Plan and other safety related documents.
.12 Other documents as stipulated elsewhere in the Contract Documents.

1.8 Site Conditions

.1 The Contractor will be responsible to visit the existing facilities and planned route to review existing site conditions.

1.9 Work Schedule

.1 Provide to the Engineer in writing and within 5 working days after Contract award, a detailed construction schedule and traffic control plan. The schedule shall show proposed work to be undertaken and anticipated completion dates for each category of work.

1.10 Sanitary Services

.1 The Contractor shall provide and maintain sanitary facilities for the use of workers at locations specified by the Engineer. Provision of sanitary facilities shall meet requirements of provincial government and municipal statutes and authorities.

1.11 Contractor's Use of Site

.1 Use of site: for execution of work within the provided right-of-way and those areas specified by the Engineer.

.2 The Engieer will specify the areas for work and storage.

1.12 Project Meetings

.1 Contractor will arrange project meetings that are to occur, at minimum, every two (2) weeks and assume responsibility for setting times and recording and distributing minutes.

.2 After receiving the Contractor's schedule, traffic control plan, health and

safety hazard assessment, and environmental protection plan, and prior to start of construction, a meeting involving Contractor, Engineer and Owner will be held at a place and time to be determined by the Engineer. This meeting will review implications of the contract, design, schedule of work health and safety, methods of construction, environment protection methods and traffic control.

.3 Interim reviews of work progress based on work schedule will be conducted as decided by Engineer and schedule updated by Contractor in conjunction with and to approval of Engineer.

.4 No work will begin until the pre-construction meeting is held, and all submittals have been approved.

.5 Following the pre-construction meeting and approval of submittals, the work will be carried out to meet the time restraints and have the project completed on time.

1.13 Existing Services

.1 Carry out work at times directed by authorities having jurisdiction, with minimum of disturbance to operations.

.2 Before commencing work, establish location and extent of service lines in area of work and notify Engineer of findings.

.3 Submit schedule to and obtain approval from Engineer for any shut down or closure of active service or facility. Adhere to approved schedule and provide notice to affected parties.

.4 Where unknown services are encountered, immediately advise Engineer and confirm findings in writing.

.5 Record locations of maintained, re-routed and abandoned service lines.

.6 Ensure pedestrian and other traffic is not unduly impeded, interrupted or endangered by execution or presence of work.

.7 Maintain existing signs at all times. When it is necessary to temporarily remove a sign, it shall be dismantled and re-established on a temporary post or stand set back from construction area. The work is considered to be incidental and no separate payment will be made for maintaining or moving signs.

.8 Verify locations of any underground utilities.

1.14 Additional Drawings

.1 Engineer may furnish additional drawings for clarification. These additional drawings have same meaning and intent as if they were included with plans referred to in Contract documents.

1.15 Permits/ Authorities

.1 The Contractor shall obtain, and pay for, permits from authorities as required for all operations and construction. He shall also comply with all pertinent regulations of all authorities having jurisdiction over the work. The Contractor shall provide copies of all permits to the Engineer prior to starting the work. The Contractor shall be responsible for obtaining all applicable permits, inspections and approvals required and shall pay all charges in connection therewith.

1.16 Protection

.1 Store all materials and equipment to be incorporated into work to prevent damage by any means.

.2 Repair and replace all materials or equipment damaged in transit or storage to the satisfaction of the Engineer and at no cost to Owner.

.3 Contractor shall take adequate precautions to protect existing structures when operating tracked equipment.

.4 Exercise care so as not to obstruct or damage public or private property in the area.

.5 At completion of work, restore area to its original condition. Damage to ground and property will be repaired by Contractor. Remove all construction materials, residue, excess, etc., and leave site in a condition acceptable to Engineer.

END

PART 1 GENERAL

1.1 Submittals

.1 Upon acceptance of bid and prior to commencement of work, submit to Engineer the following work management documents:
- .1 Work Schedule as specified herein.
- .2 Health and Safety Plan as specified in Section 01 35 29 – Health and Safety Requirements.
- .3 Environmental Protection Plan as specified in Section 01 35 43 – Environmental Procedures.
- .4 Traffic Control Plan as specified in Section 01 55 26 – Traffic Regulation.

1.2 Work Schedule

The awarded Contractor shall begin as soon as possible and be completed all works including demobilization and clean-up by on a date as directed by the Engineer.

.1 Upon acceptance of bid the Contractor shall submit:
- .1 Preliminary work schedule within 5 calendar days of contract award.

.2 Schedule to indicate all calendar dates from commencement to completion of all work within the time stated in the accepted bid.

.3 Provide sufficient details in schedule to clearly illustrate entire implementation plan, depicting efficient coordination of tasks and resources, to achieve completion of work on time and permit effective monitoring of work progress in relation to established milestones.

.4 Work schedule content to include as a minimum the following:
- .1 Bar (GANTT) Charts, indicating all work activities, tasks and other project elements, their anticipated durations, planned dates for achieving key activities and major project milestones supported with;
  - .1 Written narrative on key elements of work illustrated in bar chart, providing sufficient details to demonstrate a reasonable

implementation plan for completion of project within designated time.

.2 Generally Bar Charts derived from commercially available computerized project management system are preferred but not mandatory.

.5 Work schedule must take into consideration and reflect the work phasing.

.6 Schedule work in cooperation with the Engineer.

.7 Completed schedule shall be approved by Engineer. When approved, take necessary measures to complete work within scheduled time. Do not change schedule without Engineer's approval.

.8 Ensure that all subtrades and subcontractors are made aware of the work restraints and operational restrictions specified.

.9 Schedule Updates:

.1 Submit when requested by Engineer.

.2 Provide information and pertinent details explaining reasons for necessary changes to implementation plan.

.3 Identify problem areas, anticipated delays, impact on schedule and proposed corrective measures to be taken.

.10 Engineer will make interim reviews and evaluate progress of work based on approved schedule. Frequency of such reviews will be as decided by Engineer. Address and take corrective measures on items identified by reviews and as directed by Engineer. Update schedule accordingly.

.11 In every instance, any change or deviation from the Work Schedule, no matter how minimal the risk or impact on safety or inconvenience to tenant or public might appear, will be subject to prior review and approval by the Engineer.

1.3 Project Meetings

.1 Schedule and administer project meetings every two (2) weeks for entire duration of work.

.2 Prepare agenda for meetings.

.3 Notify participants by e-mail 4 days in advance of an unscheduled meeting date.

.1 Ensure attendance of all subcontractors.

.2 Engineer will provide list of other attendees to be notified.

.4 Hold meetings at project site or where approved by Engineer.

.5 Preside at meetings and record minutes.
.1 Indicate significant proceedings and decisions. Identify action items by parties.
.2 Distribute to participants by e-mail or by facsimile within 2 calendar days after each meeting.
.3 Make revisions as directed by Engineer.

END

PART 1 GENERAL

1.1 Related Sections

.1 Section 01 35 29 - Health and Safety Requirements.

.2 Section 01 35 43 - Environmental Procedures.

1.2 Administrative

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

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

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

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

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

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

.7 Verify that field measurements and affected adjacent Work are coordinated.

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

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

.10 Keep one reviewed copy of each submission on

site.

1.3 Shop Drawings and Product Data

.1 The term "shop drawings" means drawings, diagrams, illustrations, schedules, performance charts, brochures and other data which are to be provided by Contractor to illustrate details of a portion of Work.

.2 Submit shop drawings bearing stamp and signature of qualified professional engineer registered or licensed in the Territory of Nunavut.

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

.4 Allow ten (10) days for Engineer to review each submission.

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

.6 Make changes in shop drawings as Engineer may require, consistent with Contract Documents. When resubmitting, notify Engineer in writing of revisions other than those requested. Accompany submissions with transmittal letter, in duplicate, containing:

.1 Date.
.2 Project title and number.
.3 Contractor's name and address.
.4 Identification and quantity of each shop drawing, product data and sample.
.5 Other pertinent data.

.7 N/A

.8 Submissions include:

.1 Date and revision dates.

.2 Project title and number.
.3 Name and address of:
.1 Subcontractor.
.2 Supplier.
.3 Manufacturer.
.4 Contractor's stamp, signed by Contractor's authorized representative certifying approval of submissions, verification of field measurements and compliance with Contract Documents.
.5 Details of appropriate portions of Work as applicable:
.1 Fabrication.
.2 Layout, showing dimensions, including identified field dimensions, and clearances.
.3 Setting or erection details.
.4 Capacities.
.5 Performance characteristics.
.6 Standards.
.7 Operating weight.
.8 Wiring diagrams.
.9 Single line and schematic diagrams.
.10 Relationship to adjacent work.

.9 After Engineer's review, distribute copies.

.10 Submit four (4) prints and one (1) electronic copy of shop drawings for each requirement requested in specification Sections and as Engineer may reasonably request.

.11 Submit electronic copies of product data sheets or brochures for requirements requested in specification Sections and as requested by Engineer where shop drawings will not be prepared due to standardized manufacture of product.

.12 Submit electronic copies of test reports for requirements requested in specification Sections and as requested by Engineer.
.1 Report signed by authorized official of testing laboratory that material, product or system identical to material, product or system to be provided has been tested in accordance with specified requirements.
.2 Testing must have been within 3 years of date of contract award for project.

.13 Submit electronic copies of certificates for requirements requested in specification

Sections and as requested by Engineer.

.1 Statements printed on manufacturer's letterhead and signed by responsible officials of manufacturer of product, system or material attesting that product, system or material meets specification requirements.

.2 Certificates must be dated after award of project contract complete with project name.

.14 Submit electronic copies of manufacturer's instructions for requirements requested in specification Sections and as requested by Engineer.

.1 Pre-printed material describing installation of product, system or material, including special notices and Material Safety Data Sheets concerning impedances, hazards and safety precautions.

.15 Submit electronic copies of Manufacturer's Field Reports for requirements requested in specification Sections and as requested by Engineer.

.1 Documentation of the testing and verification actions taken by manufacturer's representative to confirm compliance with manufacturer's standards or instructions.

.16 Submit electronic copies of Operation and Maintenance Data for requirements requested in specification Sections and as requested by Engineer.

.17 Delete information not applicable to project.

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

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

proceed.

.20 The review of shop drawings by the Engineer is for sole purpose of ascertaining conformance with general concept.

.1 This review shall not mean that Engineer approves detail design inherent in shop drawings, responsibility for which shall remain with Contractor submitting same, and such review shall not relieve Contractor of responsibility for errors or omissions in shop drawings or of responsibility for meeting requirements of construction and Contract Documents.

.2 Without restricting generality of foregoing, Contractor is responsible for dimensions to be confirmed and correlated at job site, for information that pertains solely to fabrication processes or to techniques of construction and installation and for co-ordination of Work of sub-trades.

1.4 Samples

.1 Submit for review samples in triplicate as requested in respective specification Sections. Label samples with origin and intended use.

.2 Deliver samples prepaid to Engineer business address.

.3 Notify Engineer in writing, at time of submission of deviations in samples from requirements of Contract Documents.

.4 Where colour, pattern or texture is criterion, submit full range of samples.

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

.6 Make changes in samples which Engineer may require, consistent with Contract Documents.

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

1.5 Certificates and Transcripts

.1 Immediately after award of Contract, submit Territorial Safety Certification status.

.2 Submit transcription of insurance immediately after award of Contract.

END

PART 1 GENERAL

1.1 Definitions

.1 COSH: Canada Occupational Health and Safety Regulations made under Part II of the Canada Labour Code.

.2 Competent Person: means a person who is:

.1 Qualified by virtue of personal knowledge, training and experience to perform assigned work in a manner that will ensure the health and safety of persons in the workplace, and;

.2 Knowledgeable about the provisions of occupational health and safety statutes and regulations that apply to the Work and;

.3 Knowledgeable about potential or actual danger to health or safety associated with the Work.

.3 Medical Aid Injury: any minor injury for which medical treatment was provided and the cost of which is covered by Workers' Compensation Board of the territory or territory in which the injury was incurred.

.4 PPE: personal protective equipment

.5 Work Site: where used in this section shall mean areas, located at the premises where Work is undertaken, used by Contractor to perform all of the activities associated with the performance of the Work.

1.2 Submittals

.1 Make submittals in accordance with Section 01 33 00.

.2 Submit site-specific Health and Safety Plan prior to commencement of Work.

.1 Submit within 10 work days of notification of Bid Acceptance. Provide 3 copies.

.2 Engineer will review Health and Safety Plan and provide comments.

.3 Revise the Plan as appropriate and resubmit within 10 work days after receipt of comments.

.4 Engineer's review and comments made of the Plan shall not be construed as an endorsement, approval or implied

warranty of any kind by Owner and does not reduce Contractor's overall responsibility for Occupational Health and Safety of the Work.

.5 Submit revisions and updates made to the Plan during the course of Work.

.3 Submit name of designated Health & Safety Site Representative and support documentation specified in the Safety Plan.

.4 Submit building permit, compliance certificates and other permits obtained.

.5 Submit copy of Letter in Good Standing from Terratorial Workers Compensation or other department of labour organization.

.1 Submit update of Letter of Good Standing whenever expiration date occurs during the period of Work.

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

.7 Submit copies of incident reports.

.8 Submit WHMIS MSDS - Material Safety Data Sheets.

1.3 Compliance Requirements

.1 Comply with Occupational Health and Safety Act for Territory of Nunavut Occupational Health & Safety Regulations made pursuant to the Act.

.2 Comply with Canada Labour Code - Part II (entitled Occupational Health and Safety) and the Canada Occupational Health and Safety Regulations (COSH) as well as any other regulations made pursuant to the Act.

.1 The Canada Labour Code can be viewed at: www.http://laws.justice.gc.ca/en/L-2/

.2 COSH can be viewed at: www.http://laws.justice.gc.ca/eng/SOR-86-304/n e .html

.3 A copy may be obtained at: Canadian Government Publishing Public Works &

Government Services Canada Ottawa, Ontario, K1A 0S9 Tel: (819) 956-4800 (1-800-635-7943) Publication No. L31-85/2000 E or F)

.3 Observe construction safety measures of:
.1 Part 8 of National Building Code
.2 Territorial Worker's Compensation Board.
.3 Municipal by-laws and ordinances.

.4 In case of conflict or discrepancy between above specified requirements, the more stringent shall apply.

.5 Maintain Workers Compensation Coverage in good standing for duration of Contract. Provide proof of clearance through submission of Letter in Good Standing.

.6 Medical Surveillance: Where prescribed by legislation or regulation, obtain and maintain worker medical surveillance documentation.

1.4 Responsibility

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

.2 Comply with and enforce compliance by all workers, sub-contractors and other persons granted access to Work Site with safety requirements of Contract Documents, applicable federal, territorial, and local by-laws, regulations, and ordinances, and with site-specific Health and Safety Plan.

1.5 Site Control and Access

.1 Control the Work and entry points to Work Site. Approve and grant access only to workers and authorized persons. Immediately stop and remove non-authorized persons.
.1 Engineer will provide names of those persons authorized by Engineer to enter onto Work Site and will ensure that such authorized persons have the required knowledge and training on Health and Safety pertinent to their reason for being at the site, however, Contractor remains responsible for the health and safety of

authorized persons while at the Work Site.

.2 Isolate Work Site from other areas of the premises by use of appropriate means.

.1 Erect fences, hoarding, barricades and temporary lighting as required to effectively delineate the Work Site, stop non-authorized entry, and to protect pedestrians and vehicular traffic around and adjacent to the Work and create a safe environment. See Section 01 56 00 – Temporary Barriers and Enclosures for minimum acceptable requirements.

.2 Post signage at entry points and other strategic locations indicating restricted access and conditions for access.

.3 Use professionally made signs with bilingual message in the 2 official languages or international known graphic symbols.

.3 Provide safety orientation session to persons granted access to Work Site. Advise of hazards and safety rules to be observed while on site.

.4 Ensure persons granted site access wear appropriate PPE. Supply PPE to inspection authorities who require access to conduct tests or perform inspections.

.5 Secure Work Site against entry when inactive or unoccupied and to protect persons against harm. Provide security guard where adequate protection cannot be achieved by other means.

1.6 Protection

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

.2 Should unforeseen or peculiar safety related hazard or condition become evident during performance of Work, immediately take measures to rectify situation and prevent damage or harm. Advise Engineer verbally and in writing.

1.7 Filing of Notice

.1 File Notice of Project with pertinent Territorial health and safety authorities prior to beginning of Work.

.1 Engineer will assist in locating address if needed.

1.8 Permits

.1 Post permits, licenses and compliance certificates, specified in section 01 11 00 – General Instructions, at Work Site.

.2 Where a particular permit or compliance certificate cannot be obtained, notify Engineer in writing and obtain approval to proceed before carrying out applicable portion of work.

1.9 Hazard Assessments

.1 Perform site specific health and safety hazard assessment of the Work and its site.

.2 Carryout initial assessment prior to commencement of Work with further assessments as needed during progress of work, including when new trades and subcontractors arrive on site.

.3 Record results and address in Health and Safety Plan.

.4 Keep documentation on site for entire duration of the Work.

1.10 Meetings

.1 Attend pre-construction health and safety meeting, convened and chaired by Representative, prior to commencement of at time, date and location determined by Engineer. Ensure attendance of:

- .1 Superintendent of Work
- .2 Designated Health & Safety Site Representative
- .3 Subcontractors

.2 Conduct regularly scheduled tool box and safety meetings during the Work in conformance with Occupational Health and Safety regulations.

.3 Keep documents on site.

1.11 Health and Safety Plan

.1 Prior to commencement of Work, develop written Health and Safety Plan and Safety Control Plan specific to the Work. Implement, maintain, and enforce Plan for entire duration of Work and until final demobilization from site.

.2 Health and Safety Plan shall include the following components:

- .1 List of health risks and safety hazards identified by hazard assessment.
- .2 Control measures used to mitigate risks and hazards identified.
- .3 On-site Contingency and Emergency Response Plan as specified below.
- .4 On-site Communication Plan as specified below.
- .5 Name of Contractor's designated Health & Safety Site Representative and information showing proof of his/her competence and reporting relationship in Contractor's company.
- .6 Names, competence and reporting relationship of other supervisory personnel used in the Work for occupational health and safety purposes.

.3 On-site Contingency and Emergency Response Plan shall include:

- .1 Operational procedures, evacuation measures and communication process to be implemented in the event of an emergency.
- .2 Evacuation Plan: site and floor plan layouts showing escape routes, marshalling areas. Details on alarm notification methods, fire drills, location of fire fighting equipment and other related data.
- .3 Name, duties and responsibilities of persons designated as Emergency Warden(s) and deputies.

.4 Emergency Contacts: name and telephone number of officials from:
.1 General Contractor and subcontractors.
.2 Pertinent Territorial Departments and Authorities having jurisdiction.
.3 Local emergency resource organizations.
.5 Harmonize Plan with Facility's Emergency Response and Evacuation Plan. Engineer will provide pertinent data including name of PCA and Facility Management contacts.

.4 On-site Communication Plan:
.1 Procedures for sharing of work related safety information to workers and subcontractors, including emergency and evacuation measures.
.2 List of critical work activities to be communicated with Facility Manager which have a risk of endangering health and safety of Facility users.

.5 Address all activities of the Work including those of subcontractors.

.6 Review Health and Safety Plan regularly during the Work. Update as conditions warrant to address emerging risks and hazards, such as whenever new trade or subcontractor arrive at Work Site.

.7 Engineer will respond in writing, where deficiencies or concerns are noted and may request re-submission of the Plan with correction of deficiencies or concerns.

.8 Post copy of the Plan, and updates, prominently on Work Site.

1.12 Safety Supervision

.1 Employ Health & Safety Site Representative responsible for daily supervision of health and safety of the Work. Representative to be trained in occupational health and safety procedures and practices.

.2 Health & Safety Site Representative may be the Superintendent of the Work or other person designated by Contractor and shall be assigned the responsibility and authority to:

.1 Implement, monitor and enforce daily compliance with health and safety requirements of the Work.
.2 Monitor and enforce Contractor's site-specific Health and Safety Plan.
.3 Conduct site safety orientation session to persons granted access to Work Site.
.4 Ensure that persons allowed site access are knowledgeable and trained in health and safety pertinent to their activities at the site or are escorted by a competent person while on the Work Site.
.5 Stop the Work as deemed necessary for reasons of health and safety.

.3 Health & Safety Site Representative must:
.1 Be qualified and competent person in occupational health and safety.
.2 Have site-related working experience specific to activities of the Work.
.3 Be on Work Site at all times during execution of the Work.

.4 All supervisory personnel assigned to the Work shall also be competent persons.

.5 Inspections:
.1 Conduct regularly scheduled safety inspections of the Work on a minimum bi-weekly basis. Record deficiencies and remedial action taken.
.2 Conduct Formal Inspections on a minimum monthly basis. Use standardized safety inspection forms. Distribute to subcontractors.
.3 Follow-up and ensure corrective measures are taken.

.6 Cooperate with Facility's Occupational Health and Safety representative should one be designated by Engineer.

.7 Keep inspection reports and supervision related documentation on site.

1.13 Training

.1 Use only skilled workers on Work Site who are effectively trained in occupational health and safety procedures and practices pertinent to their assigned task.

.2 Maintain employee records and evidence of

training received. Make data available to Engineer upon request.

.3 When unforeseen or peculiar safety-related hazard, or condition occur during performance of Work, follow procedures in place for Employee's Right to Refuse Work in accordance with Acts and Regulations of territory having jurisdiction and advise Engineer verbally and in writing.

1.14 Minimum Site Safety Rules

.1 Notwithstanding requirement to abide by federal and territorial health and safety regulations; ensure the following minimum safety rules are obeyed by persons granted access to Work Site:
- .1 Wear appropriate PPE pertinent to the Work or assigned task; minimum being hard hat, safety footwear, safety glasses, hearing protection and high-visibility workwear.
- .2 Immediately report unsafe condition at site, near-miss accident, injury and damage.
- .3 Maintain site and storage areas in a tidy condition free of hazards causing injury.
- .4 Obey warning signs and safety tags.

.2 Brief persons of disciplinary protocols to be taken for non-compliance. Post rules on site.

1.15 Correction of Non-Compliance

.1 Immediately address health and safety non-compliance issues identified by authority having jurisdiction or by Engineer.

.2 Provide Engineer with written report of action taken to correct non-compliance of health and safety issues identified.

.3 Engineer will stop Work if non-compliance of health and safety regulations is not corrected in a timely manner.

1.16 Incident Reporting

.1 Investigate and report the following incidents to Engineer:
- .1 Incidents requiring notification to Territorial Department of Occupational

Safety and Health, Workers Compensation Board or to other regulatory Agency.
.2 Medical aid injuries.
.3 Property damage in excess of $10,000.00,
.4 Interruptions to Facility operations resulting in an operational lost to a department in excess of $5000.00.

.2 Submit report in writing.

1.17 Hazardous Products

.1 Comply with requirements of Workplace Hazardous Materials Information System (WHMIS).

.2 Keep MSDS data sheets for all products delivered to site.
.1 Post on site.
.2 Submit copy to Engineer.
.3 For interior work in an occupied Facility, post additional copy in one or more publicly accessible locations.

1.18 Blasting

.1 Blasting or other use of explosives is not permitted on site without prior receipt of written permission and instructions from Engineer.

1.19 Powder Actuated Devices

.1 Use powder actuated fastening devices only after receipt of written permission from Engineer.

1.20 Confined Spaces

.1 Abide by occupational health and safety regulations regarding work in confined spaces.

.2 Obtain an Entry Permit in accordance with Part XI of the Canada Occupational Health and Safety Regulations for entry into an existing identified confined space located at the Facility or premises of Work.
.1 Obtain permit from Facility Manager
.2 Keep copy of permit issued.

.3 Safety for Inspectors:
.1 Provide PPE and training to Engineer and other persons who require entry into confined space to perform inspections.
.2 Be responsible for efficacy of equipment and safety of persons during

their entry and occupancy in the confined space.

1.21 Site Records

.1 Maintain on Work Site copy of safety related documentation and reports stipulated to be produced in compliance with Acts and Regulations of authorities having jurisdiction and of those documents specified herein.

.2 Upon request, make available to Engineer or authorized Safety Officer for inspection.

1.22 Posting of Documents

.1 Ensure applicable items, articles, notices and orders are posted in conspicuous location on Work Site in accordance with Acts and Regulations of Territory having jurisdiction.

.2 Post other documents as specified herein, including:
.1 Site specific Health and Safety Plan
.2 WHMIS data sheets
.3 Incident reports
.4 Tool box and safety meeting minutes

END

PART 1 GENERAL

1.1 Precedence

.1 Division 1 Sections take precedence over technical specification sections in other Divisions of this Project Manual.

1.2 Related Sections

.1 Section 01 35 45 – Environmental Protection Refueling Vehicles.

.2 Section 01 74 21 – Constructional Demolition Management and Disposal.

1.3 Fires

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

1.4 Disposal of Wastes

.1 Do not bury rubbish and waste materials on site unless approved by Engineer.

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

.3 Dispose of uncontaminated construction/demolition material which cannot be recycled or reused, at an approved construction and debris disposal site.

1.5 Pollution Control

.1 Maintain temporary erosion and pollution control features installed under this contract.

.2 Control emissions from equipment and plant to local authorities' emission requirements.

.3 Prevent extraneous materials from contaminating air beyond application area, by providing temporary enclosures.

.4 Cover or wet down dry materials and rubbish to prevent blowing dust and debris. Provide dust control for temporary roads. Chemicals used in dust control must have prior approval of the Engineer.

1.6 Site Set-up and Use

.1 All site activities related to construction are to be confined within the defined project

boundaries.

.2 Work sites will be equipped with appropriate and properly maintained sanitary facilities.

.3 Garbage must be collected and removed daily from the work site. All material must be removed, transported and disposed of in accordance with existing territorial – municipal solid waste disposal guidelines and/or regulations.

.4 Littering is prohibited.

.5 Temporary storage, parking areas, and turn-a-round facilities for contractor-related equipment and vehicles will be limited to those areas agreed to and designated by the Engineer.

1.7 Environmental Protection Plan

.1 The Contractor is required to submit a plan showing all pollution control measures that will be used to fulfill the requirements of the Environmental Protection Section. This plan will be reviewed by the Engineer and the Environmental Protection Officer prior to commencement of any work. Any deviation from this plan will require further approval by the Engineer. The protection plan shall be submitted prior to the pre-construction meeting.

.2 The plan must cover all activities within the limits of all construction, laydown and traffic diversion areas.

1.8 Environmental Performance

.1 The Contractor is required to follow the Canadian Environmental Protection Act and relevant territorial acts.

.2 The Contractor is held responsible to ensure that all necessary permits related to Environmental Protection have been obtained and that necessary documentation is available on-site.

1.9 Storage and Handling of Fuels and Dangerous Fluids

.1 Locate fuel storage facility a minimum of 100 m from any water body in an area approved by Engineer and construct impermeable dykes so that any spillage is contained. Fueling of vehicles or equipment will not be permitted within 100

m of any water body. Maintenance of vehicles and equipment will be permitted only in designated areas as directed by the Engineer.

.2 Exercise care in handling of fuels or dangerous materials to minimize potential for spills. Report immediately any spills to Engineer. Contractor is responsible for responding immediately to any spill to minimize environmental damage and for clean-up, repair or rehabilitation resulting from any spills to the satisfaction of the Engineer.

.3 Supply and maintain on site emergency response material to contain spills and minimize environmental damage, i.e. absorbent material, to the approval of Engineer. Disposal of all contaminated material shall be off-site at an approved facility.

.4 Dangerous goods, whose release into the environment could cause adverse effect, should be stored and handled in a manner which gives due regard for workers and public safety, and for the protection of the environment.

.5 No material toxic to fish or any aquatic life shall be permitted to enter any stream, river, or lake. This shall include, but not be limited to lubricants, fuels, testing fluids, insecticides, detergents, herbicides, cement, lime or concrete.

.6 The management of fuels, lubricants and chemicals must meet with the requirements of the Nunavut Department of Environment & Conservation and all other appropriate territorial and federal regulations.

.7 Fuel storage containers must be accompanied by impermeable structures that would provide containment of 125% of the container capacity in the event of a leak or spill.

.8 All refueling and lubricating operations should employ protection measures such as drip pans, to reduce the potential for escape of petroleum products to the environment.

.9 The Engineer and must be immediately contacted after a spill of fuel or lubricant, and after

any amount of other chemical products has escaped.

.10 Storage of any fuel has to occur only in previously approved locations, and with Owner consent. The Contractor must submit plans for fuel management and a Spill Contingency Plan seven days prior to the start of the Work. The Contractor is expected to be prepared to effect the containment and cleanup of all spills related to the Work.

.11 Storage of hazardous material, including explosives, shall not be permitted, except for quantities which shall normally be expected to be utilized in a day of Work, and which are not permitted to stockpile.

.12 Emulsion storage tanker and transfer of emulsion from tanker to spray vehicle are not permitted.

1.10 Erosion and Sediment Control

.1 Appropriate preventative controls should be in place at all times during construction to prevent undue erosion and sedimentation. The Contractor is required to provide to the Engineer for approval ten (10) working days before start-up an erosion and sedimentation control plan, as part of the Environmental Protection Plan. The plan shall incorporate all necessary silt fences, silt traps, plastic lined trenches and ditches as approved by the Engineer. Hay or any other type of seed contaminant shall not be used in any type of erosion control method.

.2 The Contractor shall install and maintain all sedimentation and erosion control features for the duration of the project, in accordance with the approved plan. The Contractor shall remove all sedimentation and erosion control upon completion of the work and when requested by the Engineer.

.3 Sediment fences and erosion control structures shall be constructed in roadside ditches or at culvert inlets prior to any excavation as directed by Engineer.

.4 To minimize run-off, work on slopes which may affect water body will be curtained during

periods of heavy rainfall, as directed by the Engineer.

.5 Maintain a stockpile of appropriate erosion and environmental protection materials (e.g. silt fences, straw bales, wood chips, clean rock fill and aggregate base course) on site at all times.

.6 Install additional erosion control measures as required by site conditions to prevent sediment from entering drainage courses.

.7 Inspect erosion and sediment control measures on a daily basis and maintain as necessary.

1.12 Environmental Incident or Emergency

.1 In the event of an environmental incident or emergency such as:
- .1 Chemical spill or petroleum spill;
- .2 Poisonous or caustic gas emission;
- .3 Hazardous material spill;
- .4 Sewage spill;
- .5 Contaminated water into waterways.
- .6 The Contractor or his employees shall immediately:
  - .1 Notify the Contractor's job superintendent.
  - .2 Call the local emergency services and give type of emergency.
  - .3 Notify the Engineer and the Owner.

.2 The Contractor is to submit to Engineer a copy of its Environmental/Spill Response Plan for approval.

1.19 Site Decommissioning

.1 Unless prior permission from the Engineer is obtained, all contractor equipment, facilities and materials must be removed from the site at the finish of each work phase, or if work is suspended due to weather or other circumstances, upon the suspension of work activities.

.2 All work sites must be returned to a neat and tidy condition upon site abandonment.

END

PART 1 GENERAL

1.1 Refueling

.1 Refueling of equipment to be performed in locations as directed by Engineer.

.2 Do not refuel equipment within 100 meters of any watercourse or storm water catch basin unless protection against spills is in place and location is approved by Engineer.

.3 Use petroleum containers approved for products with no spill fill spouts for dispensing fuels. The sure pour nozzle to have self closing valve, prevent any flow of fuel until the nozzle is inserted into the receiving container. On removal from the receiving container the slide valve closes to eliminate any fuel spill. Nozzle to be equipped with its own automatic vent eliminating the need for the user to open or close air inlets on the pouring container.

.4 Nozzle to support the weight of the pouring container. Nozzles to automatically stop the flow when the receiving container becomes full. The nozzle to be such that it reduces evaporative losses of volatile organic compounds during the fuel transfer.

.5 **All spills** of hydrocarbon based products such as gasoline, kerosene, naphtha, lubricating oils, engine oils, greases and de-icing fluids or antifreeze **no matter how large or small** to be reported to Engineer and the Owner.

.6 Oil changes or equipment repairs in the field or on Owner land are not permitted.

.7 Refueling to be performed on level surfaces, PCC Portland cement concrete or HMAC surfaces when approved by the Engineer unless otherwise directed.

.8 Contractor to have drip pans sized for amounts of product to be recovered and customized to fit under pieces of equipment to perform routine maintenance to equipment while maintaining equipment on property. Drip Pans to be used whenever leaving equipment on site or parking overnight when not in use.

.9 Parking of equipment on site to be on level ground in locations away from watercourses and as approved by Engineer. Equipment with leaks or poor mechanical repair to be removed from site when so ordered by Engineer.

1.2 Spill Control Kit

.1 Contractor to have at the work site a spill control kit consisting of the following minimum types of equipment:

- .1 a spaded shovel;
- .2 a stable broom;
- .3 a broad nosed shovel;
- .4 a container(s) suitable, compatible to and of sufficient size to contain petroleum products being used with equipment;
- .5 absorbents;
- .6 rags;
- .7 metal container for soiled rags;
- .8 Booms when working next to a watercourse that will traverse the width of the watercourse by two times; and
- .9 Spill control kit to be inspected and approved by both the Nunavut Department of Environment & Conservation and the Engineer prior to Work commencing. Spill control kits to be available to Contractor employees at all areas where Work of the Contract is being performed and at all times during the course of the Contract.
- .10 Contractor employees to be trained in the use of the spill control kit and the equipment they contain.

1.3 Spills

.1 Disposal of spilled materials to be off Owner property and at approved locations for materials to be disposed of.

.2 When parking of equipment on site, the equipment is to be secured from entry, inspected for leaks and the ground protected from leaks.

.3 Contractor to protect all wells, catch basins, drywells, drains and watercourses from contamination in event of a spill.

.4 All equipment to be used for the Work of the Contract to be inspected by the Engineer for

leaks. Equipment not in good repair to be removed/repaired when directed by Engineer.

.5 Spills to be reported immediately to Engineer, the Owner and the Nunavut Department of Environment and Conservation.

.6 Contractor to immediately remove as much or all of the contaminated soils as possible, from any spills created from Work of the Contractor.

.7 Contaminated soils/materials to be placed in containers compatible to the contaminants.

.8 Any remaining clean-up to be performed at no extra cost to Owner. Clean-up to be to the Engineer's satisfaction.

END

PART 1 GENERAL

1.1 Related Sections

.1 Section 01 33 00 - Submittal Procedures.

1.2 Inspection

.1 Give minimum 24 hours notice requesting inspection of Work designated for special tests, inspections or approvals by Engineer or by inspection authorities having jurisdiction.

.2 In accordance with the General Conditions, Engineer may order any part of Work to be examined if Work is suspected to be not in accordance with Contract Documents.

.3 If Contractor covers or permits to be covered Work designated for special tests, inspections or approvals before such is made, uncover Work until particular inspections or tests have been fully and satisfactorily completed and until such time as Engineer gives permission to proceed.

.4 Pay costs to uncover and make good work disturbed by inspections and tests.

1.3 Testing

.1 Tests on materials, as specified in various sections of the Specifications are the responsibility of the Department except where stipulated otherwise.

.2 Engineer will engage and pay for service of Independent Inspection and Testing Agencies for purpose of inspecting and testing portions of Work except for the following which remain part of Contractor's responsibilities:

.1 Inspection and testing required by laws, ordinances, rules, regulations or orders of public authorities.

.2 Inspection and testing performed exclusively for Contractor's convenience.

.3 Mill tests and certificates of compliance.

.4 Tests as specified within various sections designated to be carried out by Contractor under the supervision of Engineer.

.5 Additional tests specified in Clause 1.3.2.

1.5 Access to Work

.1 Facilitate Engineer's access to Work. If part of Work is being fabricated at locations other than construction site, make preparations to allow access to such Work whenever it is in progress.

.2 Furnish labour and facility to provide access to the work being inspected and tested.

.3 Co-operate to facilitate such inspections and tests.

1.6 Rejected Work

.1 Remove and replace defective Work, whether result of poor workmanship, use of defective or damaged products and whether incorporated in Work or not, which has been identified by Engineer as failing to conform to Contract Documents.

.2 Make good damages to new construction and finishes resulting from removal or replacement of defective work.

END

PART 1 GENERAL

1.1 Section Includes

.1 Construction aids.

.2 Office and sheds.

.3 Parking.

.4 Project identification.

1.2 Precedence

.1 Division 1 Sections take precedence over technical specification sections in other Divisions of this Project Manual.

1.3 Related Sections

.1 Section 01 56 00 - Temporary Barriers and Enclosures.

1.4 References

.1 Canadian General Standards Board (CGSB)
- .1 CGSB 1-GP-189M-84, Primer, Alkyd, Wood, Exterior.
- .2 CGSB 1.59-97, Alkyd Exterior Gloss Enamel.

.2 Canadian Standards Association (CSA International)
- .1 CAN3-A23.1-/A23.2-94, Concrete Materials and Methods for Concrete Construction/Method of Test for Concrete.
- .2 CSA-0121-M1978, Douglas Fir Plywood.
- .3 CAN/CSA-Z321-96, Signs and Symbols for the Occupational Environment.

1.5 Installation and Removal

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

.2 Remove from site all such work after use.

1.6 Scaffolding

.1 Provide and maintain scaffolding, ladders and temporary stairs.

1.7 Hoisting

.1 Provide, operate and maintain hoists cranes required for moving of workers, materials and equipment. Make financial arrangements with Subcontractors for use thereof.

.2 Hoists cranes shall be operated by qualified operator.

1.8 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 a weight or force that will endanger the Work.

1.9 Construction Parking

.1 Parking will be limited to Contractor vehicles and equipment required to carry out work only, provided it does not disrupt performance of Work.

.2 Provide and maintain adequate access to project site.

.3 Build and maintain temporary roads where indicated or directed by Engineer and provide snow removal during period of Work.

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

1.10 Security

.1 Contractor shall provide and pay for responsible security personnel to guard site and contents of site after working hours and during holidays (24 hours per day, 7 days per week).

1.11 Engineer's Site Offices

.1 Contractor to provide Engineer's office trailer/space. Minimum office trailer/space size is 40 m^2.

.2 Contractor to arrange and pay for phone, fax machine, internet connection and photocopier in Engineer's office for its exclusive use. Long distance calls placed on this phone and fax to be paid for by Engineer. Replacement cartridges for printer and photocopier to be supplied by contractor.

.3 Contractor to equip office with washroom,

kitchen and one separate office, two 1 m x 2 m tables, one 1 m x 2 m drafting table, 4 chairs, 6 m of shelving 300 mm wide, one 3 drawer filing cabinet, one plan rack and one coat rack and shelf.

.4 Upon completion of the Contract; all equipment and furniture provided by the Contractor shall be returned to contractor.

.5 Supply of the Engineer's office, supplies and services will be incidental to the work. Payment to be included in the lump sum portion of the work.

.6 Contractor to ensure site office is supplied and operational within 14 days after contract award.

.7 Provide garbage and cleaning services bi-weekly.

.8 Maintain inside air temperature at 20 degrees.

1.12 Testing Laboratory

.1 Provide testing laboratory at aggregate production site for exclusive use of Engineer.

.1 Provide water, electrical power and propane to testing laboratory at aggregate production site, and at asphalt concrete plant.

.2 Notify Engineer sufficiently in advance of operations to allow for assignment of Laboratory personnel and scheduling of tests.

.3 No separate payment to be made for Testing Laboratory. Cost shall be deemed incidental to Contract, and deemed to be included in the lump sum portion of the work.

.4 Maintain inside air temperature at 20 degrees.

.5 Refer to the DTW Specifications Book, standard drawing 1203, for minimum size and equipment requirements.

1.13 Equipment, Tool and Materials Storage

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

.2 Locate materials not required to be stored in weatherproof sheds on site in a manner to cause

least interference with work activities.

1.14 Sanitary Facilities

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

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

1.15 Construction Signage

.1 No other signs or advertisements, other than warning signs, are permitted on site.

.2 Signs and notices for safety and instruction shall be in both official languages Graphic symbols shall conform to CAN3-Z321.

.3 Maintain approved signs and notices in good condition for duration of project, and dispose of off site on completion of project or earlier if directed by Engineer.

END

PART 1 GENERAL

1.1 Precedence .1 For Federal Government projects, Division 1 Sections take precedence over technical specification sections in other Divisions of this Project Manual.

1.2 Related Sections .1 Section 01 52 00 - Construction Facilities.

.2 Section 01 55 26 – Traffic Regulation.

1.3 References .1 Canadian General Standards Board (CGSB)
.1 CGSB 1.189M-84, Primer, Alkyd, Wood, Exterior.
.2 CGSB 1.59-97, Alkyd Exterior Gloss Enamel.

.2 Canadian Standards Association (CSA International)
.1 CSA-O121-M1978, Douglas Fir Plywood.

1.4 Installation and Removal .1 Provide temporary controls in order to execute Work expeditiously.

.2 Remove from site all such work after use.

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

.2 Provide as required by governing authorities.

.3 Provide Traffic Control guard rails, barricades and delineators in accordance with Section 01 55 26 – Traffic Regulation.

1.6 Access to Site .1 Provide and maintain access roads, as may be required for access to Work.

1.7 Public Traffic Flow .1 Provide Traffic Control in accordance with Section 01 55 26 – Traffic Regulation.

1.8 Fire Routes .1 Maintain access to properties for use by emergency response vehicles.

1.9 Protection for Off-Site and Public Property

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

.2 Be responsible for damage incurred.

END

PART 1 GENERAL

1.1 Precedence

.1 Division 1 Sections take precedence over technical specification sections in other Divisions of this Project Manual.

1.2 Reference Standards

.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 any product or system is in conformance with applicable standards, Engineer reserves right to have such products or systems tested to prove or disprove conformance.

.4 Cost for such testing will be born by Engineer in event of conformance with Contract Documents or by Contractor in event of non-conformance.

.5 Conform to latest date of issue of referenced standards in effect on date of submission of Tenders, except where specific date or issue is specifically noted.

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

.3 Should any dispute arise as to quality or fitness of products, decision rests strictly with

Engineer based upon requirements of Contract Documents.

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

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

1.4 Availability

.1 Immediately upon signing Contract, review product delivery requirements and anticipate foreseeable supply delays for any items. If delays in supply of products are foreseeable, notify Engineer 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 Engineer at commencement of Work and should it subsequently appear that Work may be delayed for such reason, Engineer reserves right to substitute more readily available products of similar character, at no increase in Contract Price or Contract Time.

1.5 Storage, Handling and Protection

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

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

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

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

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

during inclement weather.

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

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

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

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

1.6 Transportation

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

1.7 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 Engineer in writing, of conflicts between specifications and manufacturer's instructions, so that Engineer may establish course of action.

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

1.8 Quality of Work

.1 Ensure Quality of Work is of highest standard, executed by workers experienced and skilled in respective duties for which they are employed. Immediately notify Engineer if required Work is such as to make it impractical to produce required results.

.2 Do not employ anyone unskilled in their required duties. Engineer reserves 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 Engineer, whose decision is final.

1.9 Co-Ordination .1 Ensure cooperation of workers in laying out Work. Maintain efficient and continuous supervision.

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

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

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

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

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

END

PART 1 GENERAL

1.1 Precedence .1 Division 1 Sections take precedence over technical specification sections in other Divisions of this Project Manual.

1.2 Related Section .1 Section 01 77 00 - Closeout Procedures.

1.3 Project Cleanliness .1 Maintain Work in tidy condition, free from accumulation of waste products and debris, including that caused by Owner or other Contractors.

.2 Remove waste materials from site at regularly scheduled times or dispose of as directed by Engineer. Do not burn waste materials on site.

.3 Make arrangements with and obtain permits from authorities having jurisdiction for disposal of waste and debris.

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

.5 Provide and use clearly marked separate bins for recycling.

.6 Remove waste material and debris from site and deposit in waste container at end of each working day.

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

.8 Dispose of waste materials, and debris off site at approved facilities.

1.4 Final Cleaning .1 When Work is Substantially Performed, remove surplus products, tools, construction machinery and equipment not required for performance of remaining Work.

.2 Remove waste products and debris other than that caused by others, and leave Work clean and suitable for occupancy.

.3 Prior to final review, remove surplus products, tools, construction machinery and equipment.

.4 Remove waste materials from site at regularly scheduled times or dispose of as directed by Engineer. Do not burn waste materials on site.

.5 Make arrangements with and obtain permits from authorities having jurisdiction for disposal of waste and debris.

.6 Broom clean and wash exterior walks, steps and surfaces; rake clean other surfaces of grounds.

.7 Remove dirt and other disfiguration from exterior surfaces.

.8 Sweep and wash clean paved areas.

END

PART 1 GENERAL

1.1 Related Sections

.1 Section 01 33 00 - Submittal Procedures.

1.2 Precedence

.1 Division 1 Sections take precedence over technical specification sections in other Divisions of this Project Manual.

1.3 Definitions

.1 Materials Source Separation Program (MSSP): Consists of series of ongoing activities to separate reusable and recyclable waste material into material categories from other types of waste at point of generation.

.2 Recyclable: Ability of product or material to be recovered at end of its life cycle and re-manufactured into new product for reuse by others.

.3 Recycle: Process by which waste and recyclable materials are transformed or collected for purpose of being transferred into new products.

.4 Recycling: Process of sorting, cleansing, treating and reconstituting solid waste and other discarded materials for purpose of using in altered form. Recycling does not include burning, incinerating, or thermally destroying waste.

.5 Reuse: Repeated use of product in same form but not necessarily for same purpose. Reuse includes:

.1 Salvaging reusable materials from re-modelling projects, before demolition stage, for resale, reuse on current project or for storage for use on future projects.

.2 Returning reusable items including pallets or unused products to vendors.

.6 Salvage: Removal of structural and non-structural materials from deconstruction/disassembly projects for purpose of reuse or recycling.

.7 Separate Condition: Refers to waste sorted into individual types.

.8 Source Separation: Acts of keeping different

types of waste materials separate beginning from first time they became waste.

1.4 Documents

.1 Maintain at job site, one copy of following documents:
.1 Material Source Separation Plan.

1.5 Submittals

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

.2 Prepare and submit following prior to project start-up:
.1 Submit two (2) copies of Materials Source Separation Program (MSSP) description.

1.6 Waste Reduction Workplan (WRW)

.1 Prepare, Waste Reduction Workplan.

.2 Structure WRW to prioritize actions and follow as first priority Reuse, then followed by Recycle.

.3 Describe management of waste.

.4 Post workplan or summary where workers at site are able to review its content.

1.7 Materials Source Separation Program (MSSP)

.1 Prepare MSSP and have ready for use prior to project start-up. The Demolition Waste Audit (DWA), with related weight bills and/or receipt must be submitted on a monthly basis with the Contractor's monthly Progress claim.

.2 Implement MSSP for waste generated on project in compliance with approved methods and as reviewed by Engineer.

.3 Provide on-site facilities for collection, handling, and storage of anticipated quantities of reusable and recyclable materials.

.4 Provide containers to deposit reusable and recyclable materials.

.5 Locate containers in locations, to facilitate deposit of materials without hindering daily operations.

.6 Locate separated materials in areas which minimize material damage.

.7 Collect, handle, store on-site, and transport off-site, salvaged materials in separated condition.
.1 Transport to approved and authorized recycling facility.

1.8 Storage, Handling and Protection

.1 Store, materials to be reused, recycled and salvaged in locations as specified in MSSP.

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

.3 Protect, stockpile, store and catalogue salvaged items.

.4 Separate non-salvageable materials from salvaged items. Transport and deliver non-salvageable items to licensed disposal facility.

.5 Protect structural components not removed for demolition from movement or damage.

.6 Support affected structures. If safety of building is endangered, cease operations and immediately notify Engineer.

.7 Protect surface drainage, mechanical and electrical from damage and blockage.

.8 Separate and store materials produced during dismantling of structures in designated areas.

.9 Prevent contamination of materials to be salvaged and recycled and handle materials in accordance with requirements for acceptance by designated facilities.
.1 On-site source separation is recommended.
.2 Remove co-mingled materials to off-site processing facility for separation.
.3 Provide waybills for separated materials.

1.9 Disposal of Waste

.1 Do not bury rubbish or waste materials.

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

.3 Keep records of construction waste including:
.1 Number and size of bins.
.2 Waste type of each bin.

.3 Total tonnage generated.
.4 Tonnage reused or recycled.
.5 Reused or recycled waste destination.

.4 Remove materials from deconstruction as deconstruction/disassembly Work progresses.

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

1.10 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 PCA.

1.11 Scheduling .1 Coordinate Work with other activities at site to ensure timely and orderly progress of Work.

PART 2 PRODUCTS **(NOT APPLICABLE)**

PART 3 EXECUTION

3.1 Application .1 Do Work in compliance with WRW.

.2 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.

.3 Source separate materials to be reused/recycled into specified sort areas.

END

PART 1 GENERAL

1.1 Precedence

.1 Division 1 Sections take precedence over technical specification sections in other Divisions of this Project Manual.

1.2 Related Sections

.1 Section 01 78 00 - Closeout Submittals.

.2 Section 01 74 11 - Cleaning.

1.3 Inspection and Declaration

.1 Contractor's Inspection: Contractor and all Subcontractors shall conduct an inspection of Work, identify deficiencies and defects, and repair as required to conform to Contract Documents.

.1 Notify Engineer in writing of satisfactory completion of Contractor's Inspection and that corrections have been made.

.2 Request Engineer's Inspection.

.2 Engineer's Inspection: Engineer and Contractor will perform inspection of Work to identify obvious defects or deficiencies. Contractor shall correct Work accordingly.

.3 Completion: submit written certificate that following have been performed:

.1 Work has been completed and inspected for compliance with Contract Documents.

.2 Defects have been corrected and deficiencies have been completed.

.3 Work has been completed and in compliance with Workplace Health, Safety and Compliance Commission of Nunavut.

.4 Operation of systems have been demonstrated to Engineer'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 Engineer, in conjunction with Contractor. If Work is deemed incomplete by Engineer, complete outstanding items and request re-inspection.

END

PART 1 GENERAL

1.1 Precedence

.1 Division 1 Sections take precedence over technical specification sections in other Divisions of this Project Manual.

1.2 Related Sections

.1 Section 01 33 00 - Submittal Procedures.

.2 Section 01 45 00 – Testing and Quality Control.

.3 Section 01 71 00 - Examination and Preparation.

.4 Section 01 77 00 - Closeout Procedures.

1.3 Submission

.1 Copy will be returned after final inspection, with Engineer's comments.

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

.3 Two weeks prior to Substantial Performance of the Work, submit to the Engineer, four final copies of shop drawing and materials testing manuals in English.

.4 If requested, furnish evidence as to type, source and quality of products provided.

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

.6 Pay costs of transportation/delivery.

1.4 Format

.1 Binders: vinyl, hard covered, three (3) 'D' ring, loose leaf 219 x 279 mm with spine and face pockets.

.2 Cover: Identify each binder with type or printed title 'Project Record Documents'; list title of project and identify subject matter of contents.

.3 Arrange content by systems, under Section numbers and sequence of Table of Contents.

.4 Provide tabbed fly leaf for each separate product

and system, with typed description of product and major component parts of equipment.

.5 Text: Manufacturer's printed data, or typewritten data.

.6 Drawings: provide with reinforced punched binder tab. Bind in with text; fold larger drawings to size of text pages.

.7 Provide 1:1 scaled CAD files in dxf or dwg format on USB storage device or CD.

1.5 Contents – Each Volume

.1 Table of Contents: provide title of project;
- .1 date of submission; names,
- .2 addresses, and telephone numbers of Consultant and Contractor with name of responsible parties;
- .3 schedule of products and systems, indexed to content of volume.

.2 For each product or system:
- .1 list names, addresses and telephone numbers of subcontractors and suppliers, including local source of supplies and replacement parts.

.3 Product Data: mark each sheet to clearly identify specific products and component parts, and data applicable to installation; delete inapplicable information.

.4 Drawings: supplement product data to illustrate relations of component parts of systems, to show control and flow diagrams.

.5 Typewritten Text: as required to supplement product data. Provide logical sequence of instructions for each procedure, incorporating manufacturer's instructions specified in Section 01 45 00 – Testing and Quality Control.

1.6 As-Builts and Samples

.1 Maintain at the site for Engineer one record copy of:
- .1 Contract Drawings.
- .2 Specifications.
- .3 Addenda.
- .4 Change Orders and other modifications to

the Contract.
.5 Reviewed shop drawings, product data, and samples.
.6 Field test records.
.7 Inspection certificates.
.8 Manufacturer's certificates.

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

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

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

.5 Keep record documents and samples available for inspection by Engineer.

1.7 Recording Actual Site Conditions

.1 Record information on set of drawings, provided by Engineer.

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

.3 Record information concurrently with construction progress. Do not conceal Work until required information is recorded.

.4 Contract Drawings and shop drawings: legibly mark each item to record actual construction, including:
.1 Measured horizontal and vertical locations of underground utilities and appurtenances, referenced to permanent surface improvements.
.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: legibly mark each item to record actual construction, including:
- .1 Manufacturer, trade name, and catalogue number of each product actually installed, particularly optional items and substitute items.
- .2 Changes made by Addenda and change orders.

.6 Other Documents: maintain manufacturer's certifications, inspection certifications, field test records, required by individual specifications sections.

1.8 Final Survey

.1 Contractor is to submit final site survey certificate, certifying that elevations and locations of completed Work are in conformance, or non-conformance with Contract Documents.

1.9 Warranties and Bonds

.1 Separate each warranty or bond with index tab sheets keyed to Table of Contents listing.

.2 List subcontractor, supplier, and manufacturer, with name, address, and telephone number of responsible principal.

.3 Obtain warranties and bonds, executed in duplicate by subcontractors, suppliers, and manufacturers, within ten days after completion of the applicable item of work.

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

.5 Verify that documents are in proper form, contain full information, and are notarized.

.6 Co-execute submittals when required.

.7 Retain warranties and bonds until time specified for submittal.

END

Part 1 General

1.1 REFERENCES

.1 Canadian Standards Association (CSA International)

.1 CSA S350-[M1980(R1998)], Code of Practice for Safety in Demolition of Structures.

1.2 SUBMITTALS

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

.2 Submit for approval drawings, diagrams or details showing sequence of demolition work and supporting structures and underpinning, where required by authorities having jurisdiction.

.3 Hazardous Materials: provide description of Hazardous Materials and Notification of Filing with proper authorities prior to beginning of Work as required.

.4 Prior to beginning of Work on site submit detailed Waste Reduction Workplan and indicate:

.1 Descriptions of and anticipated quantities in percentages of materials to be salvaged, reused, recycled and landfilled.

.2 Schedule of selective demolition.

.3 Number and location of dumpsters.

.4 Anticipated frequency of tippage.

.5 Name and address of haulers. And waster receiving organizations.

1.3 SITE CONDITIONS

.1 Review "Designated Substance Report" and take precautions to protect environment.

.2 Should material resembling spray or trowel-applied asbestos or other designated substance listed as hazardous be encountered, stop work, take preventative measures, and notify Consultant immediately.

.1 Do not proceed until written instructions have been received from Consultant.

.3 Structures to be demolished to be based on their condition, at time of examination prior to tendering.

.4 Notify Consultant before disrupting building access or services.

Part 2 Products

2.1 NOT USED

.1 Not used.

Part 3 Execution

3.1 PREPARATION

.1 Inspect site with Consultant and verify extent and location of items designated for removal, disposal, alternative disposal, recycling, salvage and items to remain.

.2 Disconnect and cap plumbing & electrical services.

3.2 REMOVAL OF HAZARDOUS WASTES

.1 Prior to start of deconstruction work remove contaminated or hazardous materials from site and dispose of in safe manner in accordance with TDGA and other applicable regulatory requirements.

3.3 PROTECTION

.1 Keep noise, dust, and inconvenience to occupants to minimum.

.2 Protect building systems, services and equipment.

.3 Provide temporary dust screens, covers, railings, supports and other protection as required.

.4 Do Work in accordance with Section 01 35 30 - Health and Safety Requirements.

3.4 SALVAGE

.1 Refer to demolition drawings and specifications for items to be salvaged for reuse.

.2 Remove items to be reused, store as directed Consultant.

3.5 DEMOLITION

.1 Remove items as indicated.

.2 Do not disturb items designated to remain in place.

.3 Remove parts of existing building to permit new construction. Sort materials into appropriate piles for reuse.

.4 Trim edges of partially demolished building elements to tolerances as defined by Consultant to suit future use.

3.6 DISPOSAL

.1 Dispose of removed materials, except where specified otherwise, in accordance with authority having jurisdiction.

3.7 PARTIAL DEMOLITION

.1 Demolition work area as indicated on drawings. Remainder of the building is considered occupied.

END OF SECTION

Part 1 General

1.1 REFERENCES

.1 CSA Group (CSA)

.1 CAN/CSA-A165 SERIES-[04(R2014)], CSA Standards on Concrete Masonry Units (Consists of A165.1-04 Concrete Block Masonry Units, A165.2 Concrete Brick Masonry Units, A165.3 Prefaced Concrete Masonry Units).

.2 CAN/CSA-A179-[04(R2014)], Mortar and Grout for Unit Masonry.

.3 CAN/CSA-A370-[14], Connectors for Masonry.

.4 CAN/CSA A371-[04(R2014)], Masonry Construction for Buildings.

.5 CSA S304-14 - Design of masonry structures.

1.2 SUBMITTALS

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

.2 Product Data:

.1 Submit manufacturer's instructions, printed product literature and data sheets for unit masonry products, mortar and grout, connectors, anchorage and reinforcing, and accessories. Include product characteristics, performance criteria, physical size, finish and limitations.

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.

1.4 COLD WEATHER REQUIREMENTS

.1 Supplement requirements of CAN3-A371 as follows:

.1 Maintain temperature of mortar between -5°C and 50°C until used.

1.5 HOT WEATHER REQUIREMENTS

.1 Supplement requirements of CAN3-A371 as follows:

.1 Protect freshly laid masonry from drying too rapidly by means of waterproof, non-staining coverings.

Part 2 Products

2.1 MORTAR AND GROUT

.1 Mortar: to CAN/CSA-A179.

.2 Mortar Type: Interior non-loadbearing walls: Type N based on proportion specifications.

.3 Following applies regardless of mortar types and uses specified above:

.1 Mortar for stonework: type N based on proportion specifications.

.2 Mortar for grouted reinforced masonry: type S based on [proportion] specifications.

.4 Grout: to CAN/CSA-A17], Table 3.

Part 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.

3.2 INSTALLATION

.1 Do masonry work in accordance with CAN/CSA-A371 except where specified otherwise.

3.3 MODIFICATIONS TO EXISTING MASONRY

.1 Match existing bond and coursing height of adjacent masonry to remain.

.2 Tooth new masonry into existing masonry in run of wall and at intersections with existing partitions.

.3 At new openings in masonry walls, remove units, clean and re-install rotated to conceal cut and expose finish surface.

.4 Clean bond areas of adjacent masonry to remain, remove loose material and prepare masonry to receive new masonry toothed in.

.5 Install reinforcement as necessary to provide continuity of reinforcing and stability between existing and new masonry work.

.6 Provide repair anchors as necessary to stabilize existing masonry adjacent to and affected by the Work.

3.4 SPECIAL TECHNIQUES

.1 Examine mortar joints.

.1 Examine horizontal and vertical joints to determine which were struck first and whether they are the same style, as well as aspects of quality of work which establish authenticity of original work.

3.5 RAKING JOINTS

.1 Use manual raking tool to obtain clean masonry surfaces.

.1 Remove deteriorated and adhered mortar from masonry surfaces to sound mortar leaving square corners and flat surface at back of cut.

.2 Clean out voids and cavities encountered.

.2 Remove mortar without chipping, altering or damaging masonry units.

.3 Clean surfaces of joints without damaging texture of exposed joints or masonry units.

.4 Flush open joints and voids; clean open joints and voids with low pressure water and if not free draining blow clean with compressed air.

.5 Leave no standing water.

.6 Replace masonry damaged as a result of careless raking of saw cutting, at no cost to Owner.

.7 Remove mortar from top, bottom and side joints, with back surface of joint square and of an even depth.

3.6 REPOINTING

.1 When required repair and replacement work is complete carry out repointing.

.2 Before repointing, wash down wall to be repointed and allow to dry to damp, but not wet. Ensure that dust and debris are removed from joints and wall surfaces prior to repointing.

.3 Keep masonry damp while pointing is being performed.

.4 Completely fill joint with mortar.

.1 If surface of masonry units has worn rounded edges keep pointing back 1 mm from surface to maintain same width of joint

.2 Avoid feathered edges.

.3 Pack mortar firmly into voids and joints, ensuring full contact with back and sides of joint and leaving no voids.

.5 Build-up pointing in layers not exceeding 12 mm in depth.

.1 Allow each layer to set before applying subsequent layers.

.2 Maintain joint width.

.6 Finish joints to match existing profile.

.1 Tool, compact and finish using jointing tool to force mortar into joint. Ensure jointing tool fits within width of joint. Use tools of varying widths to meet this requirement.

.2 Provide final exposed aggregate texture when mortar has dried to thumb-print hardness by striking surface of joint with a stiff bristle brush.

.7 Remove excess mortar from masonry face before it sets.

1.01 PROTECTION DURING CURING PROCESS

.8 Cover completed and partially completed work not enclosed or sheltered at end of each work day.

.1 Membranes should extend to 0.5 m over surface area of work and be tightly installed to prevent finished work from drying out too rapidly.

.9 Damp cure:

.1 Provide damp cure for back pointing and finish pointing mortars, at a minimum temperature of 10 degrees C.

.2 Install and maintain wetted burlap protection during the curing process, using heavy and tight-woven burlap:

.3 Wet mist burlap only - ensure no direct spray reaches surface of curing mortar.

.4 Ensure burlap is not in contact with masonry. Leave air space of minimum 50 mm between burlap and masonry.

.5 Shade areas of work from direct sunlight and maintain constant dampness of burlap.

.6 Provide for off-hours and week-end work as required to maintain specified curing conditions.

.10 Maintain ambient temperature of minimum 10 degrees C after repointing masonry for:

.1 Minimum 7 days in summer.

.2 Minimum 30 days in cold weather conditions using dry heated enclosures.

3.7 CLEANING

.1 Leave Work area clean at end of each day.

.2 Clean surfaces thoroughly of mortar droppings, stains and other blemishes resulting from work of this contract on a daily basis, as work progresses.

.3 Remove droppings and splashings using clean water and thick cotton rags.

.4 Final Cleaning: upon completion remove surplus materials, rubbish, tools and equipment.

3.8 PROTECTION OF COMPLETED WORK

.1 Protect adjacent finished work against damage which may be caused by on-going work.

END OF SECTION

Part 1 General

1.1 RELATED REQUIREMENTS

.1 Section 06 40 00 – Architectural Woodwork

.2 Section 09 91 00 - Painting

1.2 REFERENCE STANDARDS

.1 American Society for Testing and Materials International, (ASTM)

.1 ASTM A 53/A 53M-12, Standard Specification for Pipe, Steel, Black and Hot-Dipped, Zinc-Coated Welded and Seamless.

.2 ASTM A 269M-15a, Standard Specification for Seamless and Welded Austenitic Stainless Steel Tubing for General Service.

.3 ASTM A 307-14, Standard Specification for Carbon Steel Bolts and Studs, 60,000 PSI Tensile Strength.

.2 CSA Group (CSA)

.1 CSA G40.20-13 /G40.21-13, General Requirements for Rolled or Welded Structural Quality Steel/Structural Quality Steel.

.2 CAN/CSA G164-M92(R2003), Hot Dip Galvanizing of Irregularly Shaped Articles.

.3 CSA S16-14, Design of Steel Structures.

.4 CSA W48-14, Filler Metals and Allied Materials for Metal Arc Welding (Developed in co-operation with the Canadian Welding Bureau).

.5 CSA W59-13, Welded Steel Construction (Metal Arc Welding) Metric

.3 Environmental Choice Program (ECP)

.1 CCD-048-95(2006), Surface Coatings - Recycled Water-borne

.4 Green Seal Environmental Standards (GS)

.1 GS-11-2011, Paints and Coatings

.5 The Master Painters Institute (MPI)

.1 Architectural Painting Specification Manual - current edition

.6 Underwriters Laboratories (UL)

.1 UL 2768-11, Architectural Surface Coatings

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 sections, plates, pipe, tubing and bolts and include product characteristics, performance criteria, physical size, finish and limitations.

.2 For finishes, coatings, primers, and paints applied on site: indicate VOC concentration in g/L.

.3 Shop Drawings:

.1 Submit drawings stamped and signed by professional engineer registered or licensed in Province of Newfoundland and Labrador, Canada.

.2 Indicate materials, core thicknesses, finishes, connections, joints, method of anchorage, number of anchors, supports, reinforcement, details, and accessories.

1.4 QUALITY ASSURANCE

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

.2 Certifications: submit product certificates signed by manufacturer certifying materials comply with specified performance characteristics and criteria and physical requirements.

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 off ground in dry location and in accordance with manufacturer's recommendations in clean, dry, well-ventilated area.

.2 Replace defective or damaged materials with new.

.3 Cover exposed stainless steel surfaces with pressure sensitive heavy protection paper or apply strippable plastic coating, before shipping to job site.

.4 Leave protective covering in place until final cleaning of building. Provide instructions for removal of protective covering.

Part 2 Products

2.1 MATERIALS

.1 Minimum requirements as follows:

.2 Steel sections and plates: to CAN/CSA-G40.20/G40.21, Grade 350W.

.3 Steel pipe: to ASTM A53/A53M, Schedule 40, standard weight, finish as scheduled.

.4 Welding materials: to CSA W59.

.5 Welding electrodes: to CSA W48 Series.

.6 Bolts, nuts, washers and anchors: to ASTM A307, galvanized to CSA G164 for galvanized components.

.7 Stainless steel tubing: to ASTM A269, Type 302. seamless welded with AISI No. 4 finish.

.8 Grout: non-shrink, non-metallic, flowable, 15 MPa at 24 hours.

2.2 FABRICATION

.1 Field measure prior to fabrication.

.2 Fabricate work square, true, straight and accurate to required size, with joints closely fitted and properly secured.

.3 Use self-tapping shake-proof flat headed screws on items requiring assembly by screws or as indicated.

.4 Fit and shop assemble items in largest practical sections, for delivery to site.

.5 Where possible, fit and shop assemble work, ready for erection.

.6 Exposed welds continuous for length of each joint. File or grind exposed welds smooth and flush.

.7 Exposed fasteners to be flush countersunk.

.8 Remove all splatter and slag, grind welds smooth and sand.

.1 Do not over-grind or over-sand.

2.3 Fabrication Tolerances

.1 Squareness: 3 mm maximum difference in diagonal measurements.

.2 Maximum Offset between Faces: 1.5 mm.

.3 Maximum Misalignment of Adjacent Members: 1.5 mm.

.4 Maximum Bow: 3 mm in 1.2 m.

.5 Maximum Deviation from Plane: 1.5 mm in 1.2 m.

2.4 FINISHES

.1 Galvanizing: hot dipped galvanizing with zinc coating 600 g/m² to CAN/CSA-G164.

.2 Chromium plating: chrome on steel with plating sequence of 0.009 mm thickness of copper 0.010 mm thickness of nickel and 0.0025 mm thickness of chromium.

.3 Shop coat primer MPI-INT 5.1A:

.4 Zinc primer: zinc rich, ready mix to MPI-INT 5.2C

.5 Perform finish painting in accordance with Section 09 91 00 - Panting.

.6 Shop and Touch-Up Primer: SPCC 15, Type 1, red oxide.

.7 Touch-Up Primer for Galvanized Surfaces: Zinc rich (ZRC) cold galvanizing compound, premixed, UL labelled, liquid organic zinc compound, containing minimum 92% metallic zinc by weight in the dried film, solids content between 65% and 69% by weight.

2.5 ISOLATION COATING

.1 Isolate aluminum from following components, by means of bituminous paint:

.1 Dissimilar metals except stainless steel, zinc, or white bronze of small area.

.2 Concrete, mortar and masonry.

.3 Wood.

2.6 SHOP PAINTING

.1 Apply one shop coat of primer to metal items, with exception of galvanized or concrete encased items.

.2 Use primer unadulterated, as prepared by manufacturer. Paint on dry surfaces, free from rust, scale, grease. Paint when temperature minimum 7 degrees C.

.3 Clean surfaces to be field welded; do not paint.

2.7 Steel ANGLES

.1 Steel angles at: prime painted for interior, sizes to suit, minimum thickness 6 mm.

.2 Steel angles at all openings: galvanized for exterior, sizes to suit, minimum thickness 6 mm or as indicated.

2.8 STRUCTUTAL STEEL ITEMS

.1 **The Contractor must review all architectural drawings and supply and install all structural steels, anchor bolts, etc., required and detailed on drawings.**

.2 Supply and install all steel brackets, columns, supports, steel plates and expansion anchors and all other attachments as indicated on architectural and structural drawings. Drill for countersunk screws and anchor bolts.

.3 Galvanize finish for exterior, prime paint for interior.

Part 3 Execution

3.1 EXAMINATION

.1 Verification of Conditions: verify conditions of substrates previously installed under other Sections or Contracts acceptable for metal fabrications installation in accordance with manufacturer's written instructions.

.1 Inform Departmental Representative of unacceptable conditions immediately upon discovery.

.2 Proceed with installation only after unacceptable conditions remedied.

3.2 ERECTION - GENERAL

.1 Do welding work in accordance with CSA W59 unless specified otherwise.

.2 Erect metalwork square, plumb, straight, and true, accurately fitted, with tight joints and intersections.

.3 Provide suitable means of anchorage acceptable to Consultant such as dowels, anchor clips, bar anchors, expansion bolts and shields, and toggles.

.4 Exposed fastening devices to match finish and be compatible with material through which they pass.

.5 Supply components for work by other trades in accordance with shop drawings and schedule.

.6 Make field connections with bolts to CSA S16 or Weld field connection.

.7 Deliver items over for casting into concrete and building into masonry together with setting templates to appropriate location and construction personnel.

.8 Touch-up rivets, field welds, bolts and burnt or scratched surfaces with primer after completion of:

.9 Touch-up galvanized surfaces with zinc rich primer where burned by field welding.

3.3 CLEANING

.1 Progress Cleaning: clean in accordance with Section 01 74 00 - 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.

3.4 PROTECTION

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

.2 Repair damage to adjacent materials caused by metal fabrications installation.

END OF SECTION

Part 1 General

1.1 SECTION INCLUDES (but not limited to)

.1 Blocking in wall.

.2 Wood furring and grounds.

.3 Telephone and electrical panel back boards.

.4 Equipment mounting boards.

.5 Framing and miscellaneous wood blocking, curbs and grounds.

.6 All associated fasteners and hardware.

1.2 RELATED SECTIONS

.1 Section 09 21 16 – Gypsum Board Assemblies

1.3 REFERENCES

.1 American Society for Testing and Materials International (ASTM)

.1 ASTM A-307-00, Standard Specification for Carbon Steel Bolts and Studs, 60,000 PSI tensile strength.

.2 Canadian General Standards Board (CGSB)

.1 CAN/CGSB-71.26-M88, Adhesive for Field-Gluing Plywood to Lumber Framing for Floor Systems.

.3 Canadian Plywood Association (CANPLY)

.1 CANPLY – Canadian Plywood Handbook.

.4 Canadian Standards Association (CSA International)

.1 CSA B34, Misc

.2 CSA B111-1974(R2003), Wire Nails, Spikes and Staples.

.3 CAN/CSA-G164-M92(R2003), Hot Dip Galvanizing of Irregularly Shaped Articles.

.4 CSA O80 Series-[97(R2002)] - O80S2-[05], Wood Preservation.

.5 CSA O86-01 (R-2000), Engineering Design in Wood (Limits States Design).

.6 CSA O112 Series-M1977(R2006), CSA Standards for Wood Adhesives.

.7 CSA O121-M1978(R2003), Douglas Fir Plywood.

.8 CSA O141-05, Softwood Lumber.

.9 CSA O151-04, Canadian Softwood Plywood.

.10 CSA O153-M1980(R2003), Poplar Plywood.

.11 CAN/CSA-O325.0-92(R2003), Construction Sheathing.

.12 CSA O437 Series-93(R2006), Standards on OSB and Waferboard.

.5 National Lumber Grades Authority (NLGA)

.1 Standard Grading Rules for Canadian Lumber 2005.

1.4 Submittals

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

1.5 Quality Assurance

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

.2 Plywood, Certified and graded to CANPLY requirements.

.3 OSB in accordance with CSA standards.

.4 Construction requirements: in accordance with Section 01 47 15 - Sustainable Requirements: Construction.

1.6 DELIVERY, STORAGE, AND HANDLING

.1 Waste Management and Disposal:

.1 Separate waste materials for reuse and recycling in accordance with Section 01 74 21 - Construction/Demolition Waste Management and Disposal.

Part 2 Products

2.1 FRAMING AND STRUCTURAL MATERIALS

.1 Lumber: NLGA Standard Grading Rules for Canadian Lumber.

.1 CSA O141. softwood, SPF species, Grade 2.

.2 Moisture content 19% maximum

.3 Pressure preservative treatment: to CSA-O80 Series, water-borne, for clear finish; Alkaline Copper Quaterneary (ACQ) for use in contact with ground.

.2 Furring, blocking, nailing strips, grounds, rough bucks, cants, curbs, fascia backing and sleepers:

.1 Board sizes: "Standard" or better grade.

.2 Dimension sizes: "Standard" light framing or better grade.

.3 Post and timbers sizes: "Standard" or better grade.

.4 Forestry Stewardship Council (FSC) certified.

2.2 PANEL MATERIALS

.1 Plywood:

.1 Douglas fir plywood (DFP): to CSA O121, standard construction. Urea-Formaldehyde free, thickness as indicated, grade stamped in accordance with CANPLY and as follows:

.1 Electrical, Telephone and Data and equipment mounting boards backboards: Good one-side (G1S).

.2 CSA O151 (CSP), CANPLY Grade SHG; un-sanded, exterior use, thicknesses as indicated; Urea-Formaldehyde free.

.1 General use

.2 Roof Sheathing: tongue and groove, 16 mm thickness minimum or as noted.

.3 Wall Sheathing: thickness as indicated.

.4 Pressure preservative treatment: to CSA O80.9, plywood to CSA O151.

2.3 ACCESSORIES

.1 Fasteners and Anchors:

.1 Fasteners: Hot dipped galvanized steel for high humidity and treated wood locations, unfinished steel elsewhere.

.2 Anchors: Toggle bolt type for anchorage to hollow masonry. Expansion shield and lag bolt type for anchorage to solid masonry or concrete. Bolt fastener for anchorages to steel.

.2 Resilient Furring: to ASTM C645.

.3 Sill Plate Gasket: 6 mm thick, plate width, closed cell polyethylene foam from continuous rolls.

.4 Nails, spikes and staples: to CSA B111.

.5 Framing Anchors:

.1 Framing anchors, truss anchors, and strap ties: galvanized sheet steel. Anchors and strap ties to be of type and thickness as shown on the structural drawings. See details and notes on drawings for details.

Part 3 Execution

3.1 PREPARATION

.1 Store wood products.

3.2 INSTALLATION

.1 Comply with requirements of NBC 2005 Part 9 supplemented by following paragraphs.

.1 Install members true to line, levels and elevations, square and plumb.

.2 Construct continuous members from pieces of longest practical length.

.3 Place foam sill gasket under framed assemblies in contact with concrete surfaces.

.4 Install spanning members with "crown-edge" up.

.5 Select exposed framing for appearance. Install lumber and panel materials so that grade-marks and other defacing marks are concealed or are removed by sanding where materials are left exposed.

.6 Provide solid blocking in walls where required for support of wall-mounted fixtures and assemblies.

.7 Install furring and blocking as required to space-out and support casework, cabinets, wall and ceiling finishes, facings, fascia, soffit, siding electrical equipment mounting boards, and other work as required.

.8 Install rough bucks, nailers and linings to rough openings as required to provide backing for frames and other work.

.9 Install wood cants, fascia backing, nailers, curbs and other wood supports as required and secure using galvanized fasteners.

.10 Install sleepers as indicated.

.11 Equipment mounting boards:

.1 Plywood, DFP, G1S, grade, square edge minimum 19 mm thick .

.2 Install telephone, data, equipment and electrical panel back boards sized a minimum of 300 mm beyond size of the equipment.

.12 Frame and block openings for support of door and window frames, and other equipment, as indicated.

.13 Secure sheathing to framing members with ends over firm bearing and staggered and as specified on the drawings.

.14 Install roof sheathing as specified on the drawings and in accordance with requirements of Part 9 of the NBC.

.15 Install nails or bolts in each hole provided in each framing anchor, tie down, strap, hold down, etc.

.16 Install rough bucks, nailers and rough linings to openings as required to provide backing for frames and other work.

3.3 Erection

.1 Frame, anchor, fasten, tie and brace members to provide necessary strength and rigidity.

.2 Countersink bolts where necessary to provide clearance for other work.

.3 Use nailing disks for soft sheathing as recommended by sheathing manufacturer.

END OF SECTION

Part 1 General

1.1 RELATED REQUIREMENTS

.1 Section 05 50 00 - Metal Fabrications.

.2 Section 07 92 00 - Joint Sealants: Sealant materials and application.

.3 Section 09 65 00 – Resilient Flooring

1.2 REFERENCE STANDARDS

.1 American National Standards Institute (ANSI)

.1 ANSI/ASME 18.6.1 [1981 (R2012)] Wood Screws (Inch Series).

.2 ANSI/BHMA A156.9-[2010], Cabinet Hardware.

.3 ANSI/BHMA A156.11-[2014], Cabinet Locks.

.4 ANSI/BHMA A156.16-[2013], Auxiliary Hardware.

.5 ANSI/BHMA A156.18-[2012], Materials and Finishes.

.6 ANSI A208.1-[09], Particleboard.

.7 ANSI A208.2-[09], Medium Density Fiberboard (MDF) for Interior Applications.

.8 ANSI/HPVA HP-1-[10], Standard for Hardwood and Decorative Plywood.

.2 Architectural Woodwork Manufacturers Association of Canada (AWMAC) and Woodwork Institute (WI)

.1 North American Architectural Woodwork Standards (NAAWS) 3.1, 2017.

.3 ASTM International

.1 ASTM A 153/A 153M-[16], Standard Specification for Zinc Coating (Hot-Dip) on Iron and Steel Hardware.

.2 ASTM E 1333-[14], Standard Test Method for Determining Formaldehyde Concentrations in Air and Emission Rates From Wood Products Using a Large Chamber.

.3 ASTM F 1667-[13] Standard Specification for Driven Fasteners: Nails, Spikes and Staples.

.4 Canadian General Standards Board (CGSB)

.1 CAN/CGSB-11.3-[M87], Hardboard.

.2 CAN/CGSB-71.20-[M88], Adhesive, Contact, Brushable.

.3 CAN/CGSB-71.19-[M88], Adhesive, Contact, Sprayable.

.5 CSA Group (CSA)

.1 CSA O112-M Series [1977 (R2006)] Standards for Wood Adhesives.

.2 CSA O121-[08(R2013)], Douglas Fir Plywood.

.3 CSA O141-[05 (R2014)], Softwood Lumber.

.4 CSA O151-[14], Canadian Softwood Plywood.

.5 CSA O153-[M1980 (R2014)], Poplar Plywood.

.6 CAN/CSA-Z809-[08(R2013)], Sustainable Forest Management.

.6 Forest Stewardship Council (FSC)

.1 FSC-STD-01-001-[2004], FSC Principle and Criteria for Forest Stewardship.

.7 National Electrical Manufacturers Association (NEMA)

.1 ANSI/NEMA LD-3-[05], High-Pressure Decorative Laminates (HPDL).

.8 South Coast Air Quality Management District (SCAQMD), California State, Regulation XI. Source Specific Standards

.1 SCAQMD Rule 1113-[A2011], Architectural Coatings.

.2 SCAQMD Rule 1168-[A2005], Adhesives and Sealants Applications.

.9 Sustainable Forestry Initiative (SFI)

.1 SFI-[2015-2019] Standard and Rules.

1.3 ACTION AND INFORMATIONAL SUBMITTALS

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

.2 Product Data:

.1 Prepare and submit material list in accordance with NAAWS, cross-referenced to specifications.

.2 Include manufacturer's instructions, printed product literature, data sheets and catalogue pages for all materials and products to be incorporated into architectural wood casework and include product characteristics, performance criteria, dimensions and profiles, finish and limitations on use.

.3 Hardware List:

.1 Submit hardware list cross-referenced to specifications.

.2 Include manufacturer's specification sheets indicating name, model, material, function, finish, BHMA designations and other pertinent information.

.4 Shop Drawings:

.1 Prepare and submit shop drawings in accordance with NAAWS and as follows.

.2 Indicate details of construction, profiles, jointing, fastening and other related details.

.3 Indicate materials, thicknesses, finishes and hardware.

.4 Indicate locations of service outlets in casework, typical and special installation conditions, and connections, attachments, anchorage and location of exposed fastenings.

.5 Show location on casework elevations of backing required in supporting structure for attachment of casework.

.6 Indicate NAAWS quality grade where different from predominant grade specified.

.7 Include color schedule of all casework items, including all countertop, exposed, and semi-exposed cabinet finishes, finish material manufacturer, pattern, and color.

.5 Samples:

.1 Prepare and submit samples in accordance with NAAWS and as follows.

.2 Submit duplicate samples of laminated plastic for each specified colour selection.

.3 Submit duplicate samples of laminated plastic joints, edging, cutouts and post-formed profiles.

.4 Certifications: submit certificates signed by manufacturer certifying that materials comply with specified performance characteristics and physical properties.

.5 Submit statement of experience and qualifications of architectural wood casework fabricator.

.6 No work shall be fabricated until the shop drawings have been reviewed and all related submittals and samples as required by the specification have been approved by the Consultant.

1.4 QUALITY ASSURANCE

.1 Perform Work of this Section by single architectural wood casework fabricator with minimum 5 years of current architectural casework production experience and having completed minimum one project in the past 5 years with value within 20% of the cost of the work of this Section.

1.5 PROJECT CONDITIONS

.1 Field Measurements: Where woodwork is indicated to fit to other construction, verify dimensions of other construction by field measurements before fabrication and indicate measurements on Shop Drawings.

.2 Coordinate fabrication schedule with construction progress to avoid delaying the Work.

1.6 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 Deliver wood casework only when area of work is enclosed, plaster and concrete work is dry, and area is broom clean and site environmental conditions are acceptable for installation.

.3 Protect millwork against dampness and damage during and after delivery.

.4 Store millwork in ventilated areas, protected from extreme changes of temperature and humidity, and within range recommended by NAAWS for location of project.

.5 Store materials indoors in clean, dry, well-ventilated area.

.6 Protect architectural woodwork and hardware from nicks, scratches, and blemishes.

.7 Replace defective or damaged materials with new.

Part 2 Products

2.1 SUSTAINABILITY CHARACTERISTICS

.1 Lumber, plywood and composite wood products to be CAN/CSA-Z809 or FSC or SFI certified.

.1 Composite wood products: formaldehyde emissions within the following limits when tested in accordance with ASTM E 1333.
- .1 Hardwood plywood with veneer core (HWPW-VC): [0.05 ppm].
- .2 Hardwood plywood with composite core (HWPW-CC): [0.05 ppm].
- .3 Particleboard (PB): [0.09 ppm].
- .4 Medium density fibreboard (MDF): [0.11 ppm].
- .5 Thin (less than 8 mm) medium density fibreboard (tMDF): [0.13 ppm].

.2 Adhesives: VOC limit maximum to SCAQMD Rule 1168.

.3 Coatings
- .1 Clear Wood Finishes: VOC limit maximum to SCAQMD Rule 1168.
- .2 Paints: VOC limit maximum to SCAQMD Rule 1168.

.2 Panels products supplied by this section shall conform to the minimum requirements;

.3 Canadian softwood plywood (CSP): to CSA O151, standard construction.

.1 To follow low-emitting material: composite wood requirements including NAF/ULEF.

.4 Hardboard: to ANSI A208.2 Basic hardboard. Overlay bonded to both faces to prevent warping. EPP certified for interior use.

.5 MDF (medium density fibreboard) core: to ANSI A208.2, 25 mm thick density 769 kg/m^2.

2.2 QUALITY GRADE

.1 Provide all materials and perform all fabrication in accordance with NAAWS Custom Grade and as follows, except where specified otherwise:

.2 In case of conflict between Contract Documents and NAAWS grade requirements, Contract Documents govern.

2.3 LUMBER

.1 Softwood and Hardwood Lumber: Sound lumber to specified NAAWS quality grade requirements, kiln-dried to moisture content recommended by NAAWS for location of the Work.

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

2.4 PANEL MATERIALS

.1 Interior mat-formed wood particleboard: to ANSI/NPA A208.1, industrial grade M-2 or M-3, medium density (640-800 kg/m^3), thickness 19 mm unless indicated otherwise.

.1 Use moisture resistant grade 2-M-2 or 2-M-3 for countertops and splash-backs to receive plumbing fixtures.

.2 MDF (medium density fibreboard) core: to ANSI A208.2, density 769 kg/m^3, 19 mm thick unless indicated otherwise

.1 Use moisture resistant MR grade for countertops and splash-backs to receive plumbing fixtures.

.3 Douglas fir plywood (DFP): to CSA O121, standard construction.

.4 Hardwood plywood: to [CHPA grading rules][ANSI/HPVA HP-1].

.5 Canadian softwood plywood (CSP): to CSA O151, standard construction.

.6 Poplar plywood (PP): to CSA O153, standard construction.

.7 Hardboard: To CAN/CGSB-11.3.

.8 Harwood face: Maple hardwood 19mm thick unless noted otherwise

.1 Finish: shop applied Conversion Varnish, clear, NAAWS System 5, in accordance with Section 09 91 00 - Painting

2.5 LAMINATED PLASTIC MATERIALS

.1 High-Pressure Decorative Laminates (HPL) to NEMA LD3, types as follows:

.1 General purpose type, grade as follows:

.1 HGS, 1.2 mm thick for horizontal surfaces.

.2 HGL 1mm thick for vertical surfaces.

.2 Cabinet liner type: Grade CLS, 0.5 mm thick.

.3 Backer type, grade as follows:

.1 BKH, 1.2 mm thick.

.2 BKV, 0.7 mm thick.

.4 Provide backer sheet of same thickness as face sheet to reverse of all countertops, except postformed units.

.5 Approved Manufacturers: Formica, Wilsonart, Nevamar, Arborite, Pionite or approved alternate

.6 Colour selection will be selected by the architect from full range of colour/pattern/wood finish of the manufacturer. Countertops and cabinets to be in matte finish and from full range of textures (matte, artisan, microdot, sculpted, etc…) for all cabinets doors and drawers faces.

.1 Up to 3 colours will be selected for the entire project, including countertops.

.2 Low VOC Adhesives: Contact adhesive to CAN/CGSB-71.20, semi-rigid (polyvinyl adhesive to CSA O112.4) or rigid adhesives (urea resin adhesive to CSA O112.5, resorcinol resin adhesive to CSA O112.7) may be used.

.1 Consult manufacturer for selection of adhesive for materials and application.

.2 Total VOC content of adhesives less than or equal to 80 g/L, less water, when tested to ASTM D2369.

.3 No surface treatments with added urea-formaldhyde resins or coatings.

.4 Moisture resistant adhesives used in product must compliant with ASTM 2559

.5 Use waterproof adhesives in wet areas.

2.6 SOLID SURFACE MATERIALS

.1 Solid Polymer Panels: Formed to profiles indicated for vertical applications and countertops; 13mm thickness unless noted otherwise;

.1 Color selection by Architect form unrestricted range, up to 2 colors.

.2 Acceptable Manufacturers: Wilsonart, Formica, Corian or approved alternate.

2.7 LAMINATED PLASTIC COUNTERTOPS

.1 Countertop core: Two (2) layers of 19 mm particle board, unless otherwise indicated.

.2 Finish: General purpose HPL, HGS Grade.

.3 Backer sheet: HPL

.4 Colour and pattern: As selected by Architect.

.5 Provide backsplashes and aprons as indicated. Scribe to wall and seal backsplashes.

.6 Provide matching laminate to exposed edges.

.7 Edge banding: 3 mm, PVC banding.

.1 Colour: As selected by Architect from full range of colours and patterns.

.8 Laminate sheets of up to 3660mm in length to be used to limit the number of seams. Single sheets of laminate to be used for counters up to 3660mm in length.

.9 Unsupported countertop spans shall not exceed 48” (1219mm), and they shall be reinforced to prevent deflection in excess of ¼” (6.4mm) under a 50lbs (22.7kg) per square foot load.

2.8 ACCESSORIES

.1 Wood screws: type and size to suit application.

.2 Nails and staples: to CSA B111 and ASTM F 1667.

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

.4 Metal Bracket: Richelieu, K-R650 Kolossus Heavy-Duty Aluminium Bracket

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 board insulation application in accordance with manufacturer's written instructions.

.1 Visually inspect

.2 Inform Departmental Representative of unacceptable conditions immediately upon discovery.

.3 Proceed with installation only after unacceptable conditions remedied.

3.2 INSTALLATION

.1 Install architectural wood casework in accordance with NAAWS grade for respective items.

.2 In case of conflict between Contract Documents and NAAWS grade requirements, Contract Documents govern.

.3 Install prefinished millwork at locations shown on drawings.

.1 Position accurately, level, plumb straight.

.4 Fasten and anchor millwork securely.

.1 Supply and install heavy duty fixture attachments for wall mounted cabinets.

.5 Countersink mechanical fasteners at exposed and semi-exposed surfaces, excluding installation attachment screws and screws securing cabinets end to end.

.6 Use draw bolts in countertop joints.

.7 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.

.8 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].

.9 Apply moisture barrier between wood framing members and masonry or cementitious construction.

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

.11 Make cutouts for inset equipment and fixtures using templates provided.

3.3 CLEANING

.1 Progress Cleaning: clean in accordance with Section 01 74 00 - 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.

.1 Clean millwork and cabinet work, inside cupboards and drawers and outside surfaces.

.2 Remove excess glue, pencil and ink marks 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

Part 1 General

1.1 SECTION INCLUDES

.1 Preparing substrate surfaces.

.2 Sealant and joint backing.

1.2 RELATED SECTIONS

.1 Section 06 40 00 – Architectural Woodwork

.2 Section 07 27 00 – Air Barriers

.3 Section 08 11 00 - Metal Doors and Frames.

.4 Section 09 21 16 - Gypsum Board Assemblies.

1.3 REFERENCE STANDARDS

.1 ASTM International

.1 ASTM C 919-18, Standard Practice for Use of Sealants in Acoustical Applications.

.2 ASTM C834-00e1, Standard Specification for Latex Sealants.

.3 ASTM C919-02, Standard Practice for Use of Sealants in Acoustical Applications.

.4 ASTM C920-02, Standard Specification for Elastomeric Joint Sealants.

.5 ASTM D2369-04, Standard Test Method for Volatile Content of Coatings.

.6 ASTM D5893-96, Standard Specification for Cold Applied, Single Component, Chemically Curing Silicone Joint Sealant for Portland Cement Concrete Pavements.

.2 Canadian General Standards Board (CGSB)

.1 CGSB 19-GP-5M-[1984], Sealing Compound, One Component, Acrylic Base, Solvent Curing (Issue of 1976 reaffirmed, incorporating Amendment No. 1).

.2 CAN/CGSB-19.13-[M87], Sealing Compound, One-component, Elastomeric, Chemical Curing.

.3 CGSB 19-GP-14M-[1984], Sealing Compound, One Component, Butyl-Polyisobutylene Polymer Base, Solvent Curing (Reaffirmation of April 1976).

.4 CAN/CGSB-19.17-[M90], One-Component Acrylic Emulsion Base Sealing Compound.

.5 CAN/CGSB-19.24-[M90], Multi-component, Chemical Curing Sealing Compound.

.3 General Services Administration (GSA) - Federal Specifications (FS)

.1 FS-SS-S-200-[E(2)1993], Sealants, Joint, Two-Component, Jet-Blast-Resistant, Cold Applied, for Portland Cement Concrete Pavement.

.4 South Coast Air Quality Management District (SCAQMD), California State, Regulation XI. Source Specific Standards

.1 SCAQMD Rule 1168-[A2005], Adhesives and Sealants Applications.

1.4 ACTION AND INFORMATIONAL SUBMITTALS

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

.2 Product Data:

.1 Submit manufacturer's instructions, printed product literature and data sheets for [joint sealants] and include product characteristics, performance criteria, physical size, finish and limitations.

.2 Manufacturer's product to describe:

.1 Caulking compound.

.2 Primers.

.3 Sealing compound, each type, including compatibility when different sealants are in contact with each other.

.3 Submit written confirmation that sealants are compatible with the joint forming materials.

.4 Submit laboratory tests or data validating product compliance with performance criteria specified. Include SWRI validation certificate where required.

1.5 CLOSEOUT SUBMITTALS

.1 Submit in accordance with Section 01 78 00 - Closeout Submittals.

.2 Operation and Maintenance Data: submit operation and maintenance data for incorporation into manual.

1.6 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.

.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 indoors in dry location and in accordance with manufacturer's recommendations in clean, dry, well-ventilated area.

.2 Store and protect joint sealants from [nicks, scratches, and blemishes.

.3 Replace defective or damaged materials with new.

1.7 SITE CONDITIONS

.3 Ambient Conditions:

.1 Proceed with installation of joint sealants only when:

.1 Ambient and substrate temperature conditions are within limits permitted by joint sealant manufacturer or are above 4.4 degrees C.

.2 Joint substrates are dry.

.3 Conform to manufacturer's recommended temperatures, relative humidity, and substrate moisture content for application and curing of sealants including special conditions governing use.

.4 Joint-Width Conditions:

.1 Proceed with installation of joint sealants only where joint widths are more than those allowed by joint sealant manufacturer for applications indicated.

.5 Joint-Substrate Conditions:

.1 Proceed with installation of joint sealants only after contaminants capable of interfering with adhesion are removed from joint substrates.

1.02 ENVIRONMENTAL REQUIREMENTS

.1 Comply with requirements of Workplace Hazardous Materials Information System (WHMIS) regarding use, handling, storage, and disposal of hazardous materials; and regarding labelling and provision of Safety Data Sheets (SDS) acceptable to Health Canada.

.2 Ventilate area of work by use of approved portable supply and exhaust fans.

.3 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 Do not use caulking that emits strong odours, contains toxic chemicals or is not certified as mould resistant in air handling units.

.2 When low toxicity caulks are not possible, confine usage to areas which off gas to exterior, are contained behind air barriers, or are applied several months before occupancy to maximize off gas time.

.3 Where sealants are qualified with primers use only these primers.

2.2 SEALANT MATERIAL DESIGNATIONS

.1 Acoustical sealant: to ASTM C919, single component, non-hardening, non-skinning, synthetic rubber.

.2 Acrylic latex: to ASTM C 834, single component general purpose siliconized acrylic latex sealant.

.3 Butyl Sealant: to ASTM C1311, single component, solvent release, non-skinning, nonsagging, black colour.

.4 Polyurethane, self-levelling: to ASTM C 920, Type S, Grade P, Class 25, single component self-levelling polyurethane sealant with plus or minus 25 percent movement capability for horizontal joints.

.5 Polyurethane non-sag: two parts, to ASTM C 920, Type M, Grade NS, Class 50, plus minus 50% joint movement capability.

.6 Silicone, one part: to ASTM C 920, Type S, Grade NS, Class 25, single component neutral cure silicone sealant, plus minus 50% joint movement capability.

.7 Silicone, mildew resistant: to ASTM C 920, single component mildew resistant silicone sealant, +/- 25% movement capability.

.8 Preformed compressible and non-compressible back-up materials:

.1 Polyethylene, urethane, neoprene or vinyl foam:

.1 Extruded [open][closed] cell foam backer rod.

.2 Size: oversize [30 to 50 %].

.2 Neoprene or butyl rubber:

.1 Round solid rod, Shore A hardness 70.

.3 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/m³ density, or neoprene foam backer, size as recommended by manufacturer.

.4 Bond breaker tape:

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

2.3 COLOURS

.1 Unless indicated otherwise in respective technical specification sections, colour selection is at the option of the Engineer-Architect.

2.4 SEALANT SELECTION

.1 Perimeters of exterior openings where frames meet exterior facade of building. All other exterior applications.

.1 Sealant type: Silicone, one part.

.2 Perimeters of interior door/window frames and surfaces, where required.

.1 Sealant type: Acrylic latex or Silicone, one part; refer to technical specification section.

.3 Perimeter of washroom fixtures, countertop backsplash at wall.

.1 Sealant type: Silicone, mildew resistant.

.4 Building envelope applications (vapour barrier/vapour barrier, vapour barrier/wall opening, etc):

.1 Sealant type: Acoustical sealant.

.5 Interior partitions and acoustic applications (concealed):

.1 Sealant type: Acoustical sealant.

.6 Interior partitions and acoustic applications (exposed):

.1 Sealant type: Acrylic latex or polyurethane non-sag;

.7 Interior concrete control joints and saw cuts.

.1 Sealant type: Epoxy, flexible.

.8 Perimeter of interior concrete slab.

.1 Sealant type: Polyurethane, self-levelling.

.9 For locations not included in this schedule, consult with Architect for proper selection of sealants.

2.5 JOINT CLEANER

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

.2 Primer: in accordance with sealant manufacturer's written recommendations.

Part 3 Execution

3.1 EXAMINATION

.1 Verification of Conditions: verify that conditions of substrate previously installed under other Sections or Contracts are acceptable for joint sealants installation in accordance with manufacturer's written instructions.

.1 Visually inspect substrate.

.2 Inform Departmental Representative of unacceptable conditions immediately upon discovery.

.3 Proceed with installation only after unacceptable conditions have been remedied.

3.2 SURFACE PREPARATION

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

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

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

.4 Ensure joint surfaces are dry and frost free.

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

3.3 PRIMING

.1 Where necessary to prevent staining, mask adjacent surfaces prior to priming and caulking.

.2 Prime sides of joints in accordance with sealant manufacturer's instructions immediately prior to caulking.

3.4 BACKUP MATERIAL

.1 Apply bond breaker tape where required to manufacturer's instructions.

.2 Install joint filler to achieve correct joint depth and shape, with approximately 30% compression.

3.5 MIXING

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

3.6 APPLICATION

.1 Sealant:

.1 Apply sealant in accordance with manufacturer's written instructions.

.2 Mask edges of joint where irregular surface or sensitive joint border exists to provide neat joint.

.3 Apply sealant in continuous beads.

.4 Apply sealant using gun with proper size nozzle.

.5 Use sufficient pressure to fill voids and joints solid.

.6 Form surface of sealant with full bead, smooth, free from ridges, wrinkles, sags, air pockets, embedded impurities.

.7 Tool exposed surfaces before skinning begins to give slightly concave shape.

.8 Remove excess compound promptly as work progresses and upon completion.

.2 Curing:

.1 Cure sealants in accordance with sealant manufacturer's instructions.

.2 Do not cover up sealants until proper curing has taken place.

3.7 CLEANING

.1 Progress Cleaning: clean in accordance with Section 01 74 00 - Cleaning.

.1 Leave Work area clean at end of each day.

.2 Clean adjacent surfaces immediately.

.3 Remove excess and droppings, using recommended cleaners as work progresses.

.4 Remove masking tape after initial set of sealant.

.2 Final Cleaning: upon completion remove surplus materials, rubbish, tools and equipment in accordance with Section 01 74 00 - Cleaning.

3.8 PROTECTION

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

.2 Repair damage to adjacent materials caused by joint sealants installation.

END OF SECTION

Part 1 General

1.1 SECTION INCLUDES

.1 Interior panels for walls and ceilings.

.2 Panel and joint treatment.

.3 Metal channel ceiling framing.

.4 Installation of access panels provided by others.

1.2 RELATED SECTIONS

.1 Section 06 10 53 – Miscellaneous Rough Carpentry.

.2 Section 07 84 00 - Firestopping: Coordination of supplemental blocking for ULC/UL Design.

.3 Section 07 92 00 - Joint Sealants.

.4 Mechanical and Electrical Divisions: Supply of access panels.

1.3 REFERENCE STANDARDS

.1 ASTM International (ASTM)

.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.

1.4 ACTION AND INFORMATIONAL SUBMITTALS

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

.2 Product Data:

.1 Submit manufacturer's instructions, printed product literature and data sheets for gypsum, framing, sealants and include product characteristics, performance criteria, physical size, finish and limitations.

.3 Test and Evaluation Reports: submit test reports in accordance with Section 01 45 00 - Quality Control], from approved independent testing laboratory, certifying partition system complies with fire-resistance rating as specified.

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 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 material from nicks, scratches, and blemishes.

.5 Replace defective or damaged materials with new.

1.6 QUALITY ASSURANCE

.1 Perform work in accordance with Contractor’s Indoor Air Quality Plan and Waste Management Plan.

.2 Perform Work in accordance with ASTM C840.

.3 Perform Work in shaft walls in accordance with ASTM C1280.

.4 Applicator Qualifications: Company specializing in performing the work of this section with minimum 5 years documented experience.

.5 Handling Gypsum Board: Comply with GA-801.

1.7 ENVIRONMENTAL REQUIREMENTS

.1 Temporary Indoor Air Quality (IAQ) Controls:

.1 Isolate work area with plastic sheeting.

.2 Provide supplementary ventilation exhausted to outdoors.

.2 Maintain temperature 10 degrees C minimum, 21 degrees C maximum for 48 hours prior to and during application of gypsum boards and joint treatment, and for 48 hours minimum after completion of joint treatment.

.3 Apply board and joint treatment to dry, frost free surfaces.

.4 Ventilation: ventilate building spaces as required to remove excess moisture that would prevent drying of joint treatment material immediately after its application.

1.8 COORDINATION

.1 Coordinate sanding operations with work of other trades and construction schedule to minimize contamination of permanently installed assemblies and equipment by drywall dust.

.2 Cleaning of settled dust generated by work of this Section shall be performed at end of each shift.

Part 2 Products

2.1 MATERIALS

.1 Standard Gypsum Board: ASTM C1396/C1396M, thickness as indicated, maximum available length in place; ends square cut, tapered edges.

.1 Acceptable Manufacturers: CGC, CertainTeed, Temple Inland, Cabot Gypsum Company or approved alternate.

.2 Fire Rated Gypsum Board (Type X): ASTM C1396/C1396M, fire resistive type, UL, ULC, or ITS rated; thickness as indicated, maximum available length in place; ends square cut, tapered edges.

.1 Acceptable Manufacturers: CGC, CertainTeed, Temple Inland, Cabot Gypsum Company or approved alternate.

.3 Water-resistant board: to ASTM C630/C630M Type X, 16 mm thick,1200 mm wide x maximum practical length.

.4 Plywood in accordance with Section 06 10 00 – Rough Carpentry.

.5 Access Panels: supplied by Section 08 31 13 installed by this Section.

.6 Drywall furring channels: 0.5 mm core thickness galvanized steel channels for screw attachment of gypsum board.

.7 Steel screws: to ASTM C 514.

.8 Framing: in accordance with Section 09 22 16 – Non-Structural Metal Framing

2.2 ACCESSORIES

.1 Acoustical insulation in accordance with Section 07 21 00 – Building Insulation.

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

.3 Compressible Foam Gasket: sill plate gasket; polyethylene foam, minimum thickness 6 mm x full width of sill plate.

.4 Joint Materials: ASTM C475; paper reinforcing tape, joint compound, adhesive, and water. Mesh tape only where required by ULC Design.

.5 Corner Beads: GA-216, Metal corner bead.

.6 Edge Trim: GA-216; Casing bead, L-bead, LK-bead, LC-bead and Control joints, as required.

Part 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

.2 Inform Departmental Representative of unacceptable conditions immediately upon discovery.

.3 Proceed with installation only after unacceptable conditions remedied.

3.2 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 610 mm around perimeter of fixture.

.4 Frame with furring channels, perimeter of openings for access panels, light fixtures, diffusers and grilles.

.5 Furr for gypsum board faced vertical bulkheads within and at termination of ceilings.

.6 Furr above suspended ceilings for gypsum board fire and sound stops and to form plenum areas as indicated.

.7 Install wall furring for gypsum board wall finishes in accordance with ASTM C 840, except where specified otherwise.

.8 Install acoustical insulation and sealant in sound rated partitions to correspond with tested assembly.

3.3 APPLICATION

.1 Do not apply gypsum board until bucks, anchors, blocking, sound attenuation, electrical and mechanical work are approved.

.2 Install panels in accordance with manufacturer's written instructions.

.3 Install gypsum boards in direction that will minimize number of end-butt joints. Stagger end joints 250 mm minimum.

.4 Apply single and double layer gypsum board to furring or framing using screw fasteners. Maximum spacing of screws 300] mm on centre.

.1 Single-Layer Application:

.1 Apply gypsum board on ceilings prior to application of walls in accordance with ASTM C840.

.2 Apply gypsum board vertically or horizontally, providing sheet lengths that will minimize end joints.

.2 Double-Layer Application:

.1 Install gypsum board for base layer and exposed gypsum board for face layer.

.2 Apply base layer to ceilings prior to base layer application on walls; apply face layers in same sequence. Offset joints between layers at least 250 mm.

.3 Apply base layers at right angles to supports unless otherwise indicated.

.4 Apply base layer on walls and face layers vertically with joints of base layer over supports and face layer joints offset at least 250 mm with base layer joints.

.5 Apply water-resistant gypsum board where wall tiles to be applied and adjacent to slop sinks and janitors' closets. Apply water-resistant sealant to edges, ends, cut-outs which expose gypsum core and to fastener heads. Do not apply joint treatment on areas to receive tile finish.

.6 Apply gypsum board to metal furring or framing using screw fasteners. Maximum spacing of screws 300 mm on centre.

.7 Apply 12 mm diameter bead of acoustic sealant continuously around periphery of each face of partitioning to seal gypsum board/structure junction where partitions abut fixed building components. Seal full perimeter of cut-outs around electrical boxes, ducts and in partitions where perimeter sealed with acoustic sealant.

3.4 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.

.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.

.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 panels to locations required for access.

.1 Rigidly secure frames to furring or framing systems.

.6 Provide continuous polyethylene dust barrier behind and across control joints.

.7 Locate control joints at changes in substrate construction, at approximate 10 m spacing on uninterrupted walls and ceilings, and where indicated.

.1 Place control joints consistent with lines of building spaces in coordination with Engineer-Architect.

.2 Control joints shall be installed where directed by the Engineer - Architect as required, requested, as a design accent or architectural feature at the discretion of the Engineer - Architect at no cost to the Owner.

.8 Install control joints straight and true.

.9 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.

.10 Gypsum Board Finish: finish gypsum board walls and ceilings to following levels in accordance with Association of the Wall and Ceiling Industries (AWCI) International Recommended Specification on Levels of Gypsum Board Finish:

.1 Levels of finish:

.1 Level 1 (plenum, above ceilings): Embed tape for joints and interior angles in joint compound. Surfaces to be free of excess joint compound; tool marks and ridges are acceptable.

.2 Level 4 (general application): Embed tape for joints and interior angles in joint compound and apply three separate coats of joint compound over joints, angles, fastener heads and accessories; surfaces smooth and free of tool marks and ridges.

.11 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.

.12 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.

.13 Completed installation to be smooth, level or plumb, free from waves and other defects and ready for surface finish.

.14 Sand lightly to remove burred edges and other imperfections. Avoid sanding adjacent surface of board.

.15 Completed installation to be smooth, level or plumb, free from waves and other defects and ready for surface finish.

.16 Provide protection that ensures gypsum drywall work will remain without damage or deterioration at time of substantial completion.

3.5 CLEANING

.1 Progress Cleaning: clean in accordance with Section 01 74 00 - 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.

.1 Remove insulation material spilled during installation and leave work area ready for application of wall board.

3.6 PROTECTION

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

.2 Repair damage to adjacent materials caused by partition installation.

END OF SECTION

Part 1 General

1.1 SECTION INCLUDES

.1 Interior panels for walls and ceilings.

.2 Panel and joint treatment.

.3 Metal channel ceiling framing.

.4 Installation of access panels.

1.2 RELATED SECTIONS

.1 Section 05 12 23 – Structural Steel for Buildings

.2 Section 05 41 00 – Structural Metal Stud Framing

.3 Section 06 10 00 – Rough Carpentry.

.4 Section 07 21 00 - Building Insulation: Acoustic and Thermal insulation.

.5 Section 07 92 00 – Joint Sealants

.6 Section 08 11 00 – Metal Doors and Frames

.7 Section 08 31 13 – Access Doors and Frames

.8 Section 09 21 16 - Gypsum Board Assemblies.

1.3 REFERENCES

.1 American Society for Testing and Materials International, (ASTM).

.1 ASTM C645-00, Specification for Non-structural Steel Framing Members.

.2 ASTM C754-00, Specification for Installation of Steel Framing Members to Receive Screw-Attached Gypsum Panel Products.

.2 Canadian General Standards Board (CGSB).

.1 CAN/CGSB-1.40-97, Primer, Structural Steel, Oil Alkyd Type.

.3 Environmental Choice Program (ECP).

.1 CCD-047a -98, Paints - Surface Coatings.

.2 CCD-048-98, Surface Coatings - Recycled Water-borne.

1.4 ACTION AND INFORMATION 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 framing and include product characteristics, performance criteria, physical size, finish and limitations.

1.5 QUALITY ASSURANCE

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

.2 Certificates: product certificates signed by manufacturer certifying materials comply with specified performance characteristics and criteria and physical requirements.

.3 Pre-Installation Meetings: conduct pre-installation meeting to verify project requirements, manufacturer's installation instructions and manufacturer's warranty requirements.

1.6 WASTE MANAGEMENT AND DISPOSAL

.1 Separate and recycle waste materials in accordance with Section 01 74 20 - Construction Waste Management and Disposal.

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

.3 Divert unused metal materials from landfill to metal recycling facility.

Part 2 Products

2.1 MATERIALS

.1 Non-load bearing channel stud framing: ASTM C645; galvanized sheet steel, 0.91 mm thick unless indicated otherwise, C-shape, with knurled faces. Knock-out service holes at 460 mm centres.

.2 Shaft wall stud framing, C-T or C-H type stud, ASTM C645, in accordance with rated design, length to suit.

.3 Floor and ceiling tracks: to ASTM C645, in widths to suit stud sizes, 32 mm flange height.

.4 Furring, Framing, and Accessories: ASTM C645 and GA-216. Use 200 mm wide 18 gauge studs for blocking for support of finishes and fixtures.

.5 Metal channel stiffener: 38 x 12 mm size, 1.4 mm thick cold rolled steel, coated with rust inhibitive coating.

.6 Fasteners: ASTM C1002. Exterior finish to be corrosion-resistant.

.7 Anchorage to Substrate: Tie wire, nails, screws, and other metal supports, of type and size to suit application; to rigidly secure materials in place.

.8 Blocking: Wood framing or 19 mm plywood as required, in accordance with Section 06 10 00 – Rough Carpentry.

.9 Acoustical sealant: to Section 09 92 00 – Joint Sealants.

.10 Insulating strip: rubberized, moisture resistant 3 mm thick foam strip, 12 mm wide, with self sticking adhesive on one face, lengths as required.

Part 3 Execution

3.1 EXAMINATION

.1 Verification of Conditions: verify that conditions of substrate previously installed under other Sections or Contracts are acceptable for non-structural metal framing application in accordance with manufacturer's written instructions.

.2 Inform DTI Representative and Engineer – Architect of unacceptable conditions immediately upon discovery.

.3 Proceed with installation only after unacceptable conditions have been remedied and after receipt of approval to proceed from Engineer - Architect.

3.2 ERECTION

.1 Align partition tracks at floor and ceiling and install in accordance with ASTM C 754.

.2 Install damp proof course under stud shoe tracks of partitions on slabs on grade.

.3 Place studs vertically at 406 mm on centre and not more than 50 mm from abutting walls, and at each side of openings and corners. Position studs in tracks at floor and ceiling. Cross brace steel studs as required to provide rigid installation to manufacturer's instructions.

.4 Review drawings carefully to provide adequate extra studs and bracing as required to support wall hung equipment, accessories, casework, etc.…

.5 Erect metal studding to tolerance of 1:1000.

.6 Attach studs to bottom and ceiling track using screws.

.7 Co-ordinate simultaneous erection of studs with installation of service lines. When erecting studs ensure web openings are aligned.

.8 Co-ordinate erection of studs with installation of door/window frames and special supports or anchorage for work specified in other Sections.

.9 Provide two studs extending from floor to ceiling at each side of openings wider than stud centres specified. Secure studs together, 50 mm apart using column clips or other approved means of fastening placed alongside frame anchor clips.

.10 Install heavy gauge single jamb studs at openings.

.11 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.

.12 Frame openings and around built-in equipment, cabinets, access panels, on four sides. Extend framing into reveals. Check clearances with equipment suppliers.

.13 Provide 40 mm stud or furring channel secured between studs for attachment of fixtures behind lavatory basins, toilet and bathroom accessories, and other fixtures including grab bars and towel rails, attached to steel stud partitions.

.14 Install steel studs or furring channel between studs for attaching electrical and other boxes.

.15 Extend partitions to ceiling height except where noted otherwise on drawings.

.16 Maintain clearance under beams and structural slabs to avoid transmission of structural loads to studs. Use double track slip joint.

.17 Install continuous insulating strips to isolate studs from uninsulated surfaces.

.18 Install two continuous beads of acoustical sealant under studs and tracks around perimeter of sound control partitions.

3.3 WALL FURRING INSTALLATION

.1 Erect furring for direct attachment to concrete masonry and concrete walls.

.2 Erect furring channels; space maximum 400 mm on centre, not more than 100 mm from floor and ceiling lines and abutting walls.

.3 Secure in place on alternate channel flanges at maximum 600 mm on centre.

.4 Shim wall and rigidly secure to substrate to prevent deflection.

3.4 FURRING FOR FIRE RATINGS

.1 Install furring as required for fire resistance ratings indicated.

3.5 CEILING FRAMING INSTALLATION

.1 Install in accordance with ASTM C754 and manufacturer's instructions.

.2 Coordinate location of hangers with other work.

.3 Install ceiling framing independent of walls, columns, and above ceiling work.

.4 Reinforce openings in ceiling suspension system which interrupt main carrying channels or furring channels, with lateral channel bracing. Extend bracing minimum 600 mm past each end of openings.

.5 Laterally brace entire suspension system.

3.6 ACCESSORIES INSTALLATION

.1 Install access panels to locations required for access.

.2 Install resilient channels at maximum 600 mm on centre. Locate joints over framing members.

3.7 Sound Insulation Installation

.1 Cut, fit and butt joints tight.

.2 Place batts in cavities formed by framing members to produce a friction fit between edges of insulation and adjoining framing members.

.3 Place acoustic insulation in partitions tight within spaces, around cut openings, behind and around electrical and mechanical items within or behind partitions, and tight to items passing through partitions.

3.8 CLEANING

.1 Progress Cleaning: leave work area clean at end of each day.

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

.3 Waste Management: separate waste materials in accordance with Section 01 74 20 – Construction Waste Management and Disposal.

.4 Remove recycling containers and bins from site and dispose of materials at appropriate facility.

3.9 PROTECTION

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

.2 Repair damage to adjacent materials caused by non-structural metal framing application.

END OF SECTION

Part 1 General

1.1 SECTION INCLUDED

.1 Resilient Sheet Flooring

1.2 REFERENCE STANDARDS

.1 American Society for Testing and Materials (ASTM)

.1 ASTM D 2047-[04], Standard Test Method for Static Coefficient of Friction of Polish-Coated Flooring Surfaces as Measured by the James Machine.

.2 ASTM F 1303-[04(2009)], Standard Specification for Sheet Vinyl Floor Covering with Backing.

.3 ASTM F 1344-[15], Standard Specification for Rubber Floor Tile.

.2 South Coast Air Quality Management District (SCAQMD), California State, Regulation XI. Source Specific Standards

.1 SCAQMD Rule 1113- [A2007], Architectural Coatings.

.2 SCAQMD Rule 1168-[A2005], Adhesives and Sealants Applications.

1.3 ACTION AND INFORMATIONAL SUBMITTALS

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

.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.

.3 Samples:

.1 Submit for review and acceptance

.2 Submit duplicate full-size samples of each type of tile.

1.4 QUALITY ASSURANCE

.1 Installer qualifications: Installer experienced in performing work of this section who has completed work similar in scope and size. Installer must be certified by flooring manufacturer.

1.5 CLOSEOUT SUBMITTALS

.1 Submit in accordance with Section 01 78 00 - Closeout Submittals.

.2 Operation and Maintenance Data: submit operation and maintenance data for resilient flooring for incorporation into manual.

1.6 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 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.

1.7 ENVIRONMENTAL REQUIREMENTS

.1 Temperature Requirements: If storage temperature is below 18°C, flooring product must be moved to warmer place and allowed to reach this temperature before unrolling or installation. The room temperature must not be below 18°C and the floor temperature 10°C.

.2 Maintain air temperature and structural base temperature at flooring installation area above 20 degrees for 48 hours before, during and 48 hours after installation.

.3 Provide a high ventilation rate, with maximum outside air, during installation, and for 48 to 72 hours after installation. If possible, vent directly to the outside. Do not let contaminated air recirculate through a district or whole building air distribution system. Maintain extra ventilation for at least one month following building occupation.

.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.

.4 The General Contractor will provide heating required to achieve proper subfloor moisture and temperature conditions for duration of installation.

1.8 EXTRA MATERIALS

.1 Provide 2.5 m^2 of each colour, pattern and type of resilient flooring. Provide one continuous full width roll.

.2 Extra materials to be from same production run as installed materials.

.3 Store where directed.

Part 2 Products

2.1 RESILIENT FLOORING MATERIALS

.1 Resilient Sports Flooring Rubber Mats, square cut:

.1 Thickness: 7mm

.2 Pattern and Colour: selected by Architect from manufacturer’s full range of patterns and colours without restrictions.

.3 Acceptable products: Vulcano Sport flooring by Dinoflex or approved alternate

2.2 ACCESSORIES

.1 Primers and adhesives: of types recommended by resilient flooring manufacturer for specific material on applicable substrate, above, on or below grade.

.1 Adhesive to be type used to 8 lb/1000 sq. ft./24 hours moisture emission rate when tested by calcium chloride moisture test in compliance with CRI 104, with subfloor temperatures not less than 12 degrees C.

.1 Total VOC content of adhesive less than or equal to 50 g/L, less water, when tested to ASTM D2369.

.2 To minimize emissions from adhesives, use water-based, solvent-free styrene-butadiene-rubber adhesive for linoleum. Butadiene exposure may cause eye and nose irritation, headaches, dizziness, and vomiting.

.2 Patching and Underlayment Compound: Moisture-, mildew-, and alkali-resistant, commercial type minimum 3500 psi compressive strength after 28 days when tested to ASTM C109 or C472; approved by flooring manufacturer.

.3 Sub-floor Filler and Leveller: as recommended by flooring manufacturer for use with their product.

.4 Metal edge strips: extruded aluminum, smooth, [mill finish][polished] stainless steel with lip to extend under floor finish, shoulder flush with top of adjacent floor finish.

.1 Finish: as selected by Architect from manufacturer’s standard range.

.5 Resilient Transitional Mouldings: as selected by Engineer-Architect from manufacturer's full product line, to terminate and transition flooring materials of different colour, thickness and type. Colour selected by Engineer-Architect from full solid colour range. Acceptable Manufacturer: Johnsonite, Marathon or approved equal.

Part 3 Execution

3.1 EXAMINATION

.1 Examine conditions, substrates and work to receive work of this Section, co-ordinate with Section 01 71 00 - Examination and Preparation.

.2 Verification of Conditions: verify that conditions of substrate previously installed under other Sections or Contracts are acceptable for board insulation application in accordance with manufacturer's written instructions.

.1 Visually inspect

.2 Inform Departmental Representative of unacceptable conditions immediately upon discovery.

.3 Proceed with installation only after unacceptable conditions remedied.

.3 Ensure concrete floors are clean and dry by using test methods recommended by flooring manufacturer.

3.2 PREPARATION

.1 The recommendations of the manufacturer of the resilient floor covering will be considered as minimal.

.2 Perform calcium chloride moisture testing of concrete floor slabs and certify to Architect that moisture levels are within manufacturer's range prior to installation of floor coverings.

.3 Perform test for alkalinity and certify to Architect that pH levels are within manufacturer's range prior to installation of floor coverings.

.4 Perform adhesive bond test and certify to Architect that results of bond test are acceptable.

.5 Comply with ASTM F710 for surface preparation.

.1 Concrete floors with steel trowelled (slick) finish shall be properly roughened or sanded to ensure suitable adhesion.

.2 Concrete floors with curing, hardening, or sealing compounds shall be abraded by steel shot blast to remove compounds.

.6 Subfloors to be permanently dry, clean, smooth, and structurally sound.

.7 Subfloors to be free of dust, solvent, paint, wax, oil, grease, residual adhesive, adhesive removers, curing, sealing, hardening, or parting compounds, alkaline salts, excessive carbonation or laitance, mould, mildew, and other foreign materials that might prevent adhesive bond.

.8 Surface cracks, grooves, depressions, control joints or other non-moving joints, and other irregularities to be filled or smoothed with latex patching or underlayment compound recommended by the resilient flooring manufacturer for filling or smoothing, or both.

.9 Smooth subfloor to prevent irregularities, roughness, or other defects from telegraphing through the new resilient flooring.

.10 Clean floor and apply filler; trowel and float to leave smooth, flat hard surface. Prohibit traffic until filler cured and dry.

.11 Prepare for installation in accordance with manufacturer's written recommendations.

3.3 APPLICATION: FLOORING

.1 Install resilient flooring in accordance with manufacturer's printed installation instructions.

.2 Apply adhesive uniformly using recommended trowel. Do not spread more adhesive that can be covered by flooring before initial set takes place.

.3 Lay flooring with seams parallel to building lines to produce a minimum number of seams.

.4 Lay flooring to pattern indicated on reviewed cut diagrams. Minimize number of seams.

.5 As installation progresses, and after installation roll flooring with 45 kg minimum roller to ensure full adhesion.

.6 Install resilient flooring without cracks or voids at seams. Lay seams together without stress

.7 Make penetrations through flooring materials watertight, including floor drains and clean-outs, in accordance with manufacturer’s written installation instructions.

.8 Cut flooring neatly around fixed objects.

.9 Continue flooring over areas which will be under built-in furniture.

.10 Continue flooring through areas to receive movable type partitions without interrupting floor pattern.

.11 Terminate resilient flooring at centreline of door in openings where adjacent floor finish or colour is dissimilar.

.12 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 Outside/inside corners: to be smooth and taght by using a top-set of pull type gouge tool to make a shallow notch along the back of the base and apply heat to fit tight on the corner of wall. Apply adhesive and roll firmly into place.

.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 00 - Cleaning.

.1 Leave Work area clean at end of each day.

.2 Remove excess adhesive from floor, base and wall surfaces without damage.

.3 Do not perform manufacturer's recommended initial maintenance procedures until adhesive has fully cured, no sooner than 72 hours after installation.

.4 Sweep and vacuum floor after installation.

.5 Do not wash floor until after time period recommended by flooring manufacturer.

.6 Final Cleaning: upon completion remove surplus materials, rubbish, tools and equipment in accordance with Section [01 74 00 - Cleaning].

.1 Remove excess adhesive from floor, base and wall surfaces without damage.

.2 Clean, seal and wax floor and base surface to flooring manufacturer's printed instructions.

.7 Waste Management: separate waste materials for reuse and recycling in accordance with Section 01 74 19 - Waste Management and Disposal.

.1 Remove recycling containers and bins from site and dispose of materials at appropriate facility.

3.6 PROTECTION

.1 Protect new floors in accordance with manufacturer's printed instructions.

.2 Protect new floors from time of final set of adhesive until initial maintenance.

.3 Prohibit traffic on floor for 48 hours after installation.

END OF SECTION

Part 1 General

1.1 RELATED SECTIONS

.1 Section 05 50 00 – Metal Fabrications.

.2 Section 06 10 00 – Rough Carpentry.

1.2 REFERENCE STANDARDS

.1 Architectural Woodwork Manufacturers Association of Canada (AWMAC) and Woodwork Institute (WI)

.1 North American Architectural Woodwork Standards (NAAWS) 3.1, 2017.

.2 Environmental Protection Agency (EPA)

.1 Test Method for Measuring Total Volatile Organic Compound Content of Consumer Products, EPA Method 24 - Surface Coatings.

.2 SW-846, Test Methods for Evaluating Solid Waste: Physical/Chemical Methods.

.3 Health Canada/Workplace Hazardous Materials Information System (WHMIS)

.1 Safety Data Sheets (SDS).

.4 Master Painters Institute (MPI)

.1 The Master Painters Institute (MPI)/Architectural Painting Specification Manual (ASM) - [current edition].

.2 Standard GPS-1-[12], MPI Green Performance Standard.

.3 Standard GPS-2-[12], MPI Green Performance Standard.

.5 Society for Protective Coatings (SSPC)

.1 SSPC Painting Manual, Volume Two, 8th Edition, Systems and Specifications Manual.

1.3 ADMINISTRATIVE REQUIREMENTS

.1 Scheduling:

.1 Submit work schedule for various stages of painting to Departmental Representative for review. Provide schedule minimum of 48 hours in advance of proposed operations.

.2 Obtain written authorization from Departmental Representative for changes in work schedule.

.3 Schedule new additions to existing building coordinate painting operations with other trades.

1.4 ACTION AND INFORMATIONAL SUBMITTALS

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

.2 Product Data:

.1 Provide manufacturer's instructions, printed product literature and data sheets for paint and paint products and include product characteristics, performance criteria, physical size, finish and limitations.

.2 Provide comprehensive schedule indicated which product is proposed for which application, following schedule of this section.

.3 Confirm products to be used are in MPI's approved product list.

.3 Upon completion, provide records of products used. List products in relation to finish system and include the following:

.1 Product name, type and use.

.2 Manufacturer's product number.

.3 Colour number[s].

.4 MPI Environmentally Friendly classification system rating.

.5 Manufacturer's Safety Data Sheets (SDS).

.6 MPI # .

.4 Samples:

.1 Submit full range colour sample chips to indicate where colour availability is restricted.

.2 Submit 200 x 300 mm sample panels of each stain with specified paint or coating in colours, gloss/sheen and textures required to MPI Architectural Painting Specification Manual standards submitted on following substrate materials:

.1 Black spruce lumber with clear varnish INT 6.1F system.

.3 Retain reviewed samples on-site to demonstrate acceptable standard of quality for appropriate on-site surface.

.5 Manufacturer's Instructions:

.1 Provide manufacturer's installation and application instructions.

1.5 CLOSEOUT SUBMITTALS

.1 Provide in accordance with Section 01 78 00 - Closeout Submittals.

.2 Operation and Maintenance Data: Provide operation and maintenance data for painting materials for incorporation into manual.

.3 Include:

.1 Product name, type and use.

.2 Manufacturer's product number.

.3 Colour number[s].

.4 MPI Environmentally Friendly classification system rating.

1.6 MAINTENANCE MATERIAL SUBMITTALS

.1 Extra Stock Materials:

.1 Provide maintenance materials in accordance with Section 01 78 00 - Closeout Submittals.

.2 Submit 1 four litre can of each type and colour of primer, stain and finish coating. Identify colour and paint type in relation to established colour schedule and finish system.

1.7 QUALITY ASSURANCE

.1 Qualifications:

.1 Contractor: to have a minimum of 5 years proven satisfactory experience. When requested, provide list of last 3 comparable jobs including, job name and location, specifying authority, and project manager.

.2 Qualified journeypersons as defined by local jurisdiction to be engaged in painting work.

.3 Apprentices: may be employed provided they work under direct supervision of qualified journeyperson in accordance with trade regulations.

.4 Conform to latest MPI requirements for exterior painting work including preparation and priming.

.5 Materials: in accordance with MPI Painting Specification Manual "Approved Product" listing and from a single manufacturer for each system used.

.6 Retain purchase orders, invoices and documents to prove conformance with noted MPI requirements when requested by Departmental Representative.

.2 Mock-Ups:

.1 When requested by Departmental Representative or Paint Inspection Agency, prepare and paint designated surface, area, room or item to requirements specified herein, with specified paint or coating showing selected colours, number of coats, gloss/sheen, textures and quality of work to MPI Painting Specification Manual standards for review and approval.

.2 Construct mock-ups in accordance with Section 01 45 00 - Quality Control.

.1 Mock-up will be used to judge quality of work, substrate preparation, operation of equipment and material application and skill to MPI Architectural Painting Specification Manual standards.

.2 When accepted, mock-up will demonstrate minimum standard of quality required for this work. Approved mock-up may remain as part of finished work.

1.8 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.

.1 Labels: to indicate:

.1 Type of paint or coating.

.2 Compliance with applicable standard.

.3 Colour number in accordance with established colour schedule.

.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 Observe manufacturer's recommendations for storage and handling.

.3 Store materials and supplies away from heat generating devices.

.4 Store materials and equipment in well ventilated area with temperature range 7 degrees C to 30 degrees C.

.5 Keep areas used for storage, cleaning and preparation, clean and orderly. After completion of operations, return areas to clean condition.

.6 Remove paint materials from storage only in quantities required for same day use.

.7 Comply with requirements of Workplace Hazardous Materials Information System (WHMIS) regarding use, handling storage, and disposal of hazardous materials.

.8 Fire Safety Requirements:

.1 Provide one 9 kg Type ABC fire extinguisher adjacent to storage area.

.2 Store oily rags, waste products, empty containers and materials subject to spontaneous combustion in ULC approved, sealed containers and remove from site on a daily basis.

.3 Handle, store, use and dispose of flammable and combustible materials in accordance with the National Fire Code of Canada (NFC).

1.9 SITE CONDITIONS

.1 Ambient Conditions:

.1 Heating, Ventilation and Lighting:

.1 Ventilate enclosed spaces in accordance with Section 01 57 15 – Indoor Air Quality Management.

.2 Provide heating facilities to maintain ambient air and substrate temperatures above 10 degrees C for 24 hours before, during and after paint application until paint has cured sufficiently.

.3 Provide continuous ventilation for 7 days after completion of application of paint.

.4 Provide temporary ventilating and heating equipment where permanent facilities are not available or supplemental ventilating and heating equipment if ventilation and heating from existing system is inadequate to meet minimum requirements.

.5 Provide minimum lighting level of 323 Lux on surfaces to be painted.

.6 Temperature, Humidity and Substrate Moisture Content Levels:

.1 Unless pre-approved written approval by and product manufacturer, perform no painting when substrate and ambient air temperatures are not expected to fall within MPI or paint manufacturer's prescribed limits.

.2 Ensure that conditions are within specified limits during drying or curing process, until newly applied coating can itself withstand 'normal' adverse environmental factors.

.3 Perform painting work when maximum moisture content of the substrate is below:

.1 12% for concrete and masonry (clay and concrete brick/block). Allow new concrete and masonry to cure minimum of 28 days.

.2 15% for hard wood.

.3 17% for soft wood.

.4 12% for plaster and gypsum board.

.4 Test for moisture using calibrated electronic Moisture Meter. Test concrete floors for moisture using "cover patch test".

.5 Test concrete, masonry and plaster surfaces for alkalinity as required.

.7 Surface and Environmental Conditions:

.1 Apply paint finish in areas where dust is no longer being generated by related construction operations or when wind or ventilation conditions are such that airborne particles will not affect quality of finished surface.

.2 Apply paint to adequately prepared surfaces and to surfaces within moisture limits.

.3 Apply paint when previous coat of paint is dry or adequately cured.

.8 Additional interior application requirements:

.1 Apply paint finishes when temperature at location of installation can be satisfactorily maintained within manufacturer's recommendations.

Part 2 Products

2.1 MATERIALS

.1 Only Paint materials listed in the MPI Approved Products List (APL) are acceptable for use on this project.

.2 Provide paint materials for paint systems from single manufacturer.

.3 Conform to latest MPI requirements for interior painting work including preparation and priming.

.4 Provide paint products meeting MPI "Environmentally Friendly" [E1], [E2][E3] ratings based on VOC (EPA Method 24) content levels.

.5 Use MPI listed materials having minimum [E2][E3] rating where indoor air quality (odour) requirements exist.

.6 Paints, coatings, adhesives, solvents, cleaners, lubricants, and other fluids to be:

.1 Be Water-based.

.2 Be non-flammable.

.3 Be manufactured without compounds which contribute to ozone depletion in the upper atmosphere.

.4 Be manufactured without compounds which contribute to smog in the lower atmosphere.

.5 Do not contain methylene chloride, chlorinated hydrocarbons, toxic metal pigments.

.7 Ensure manufacture and process of both water-borne surface coatings and recycled water-borne surface coatings does not release:

.1 Matter in undiluted production plant effluent generating 'Biochemical Oxygen Demand' (BOD) in excess of 15 mg/L to natural watercourse or sewage treatment facility lacking secondary treatment.

.2 Total Suspended Solids (TSS) in undiluted production plant effluent in excess of 15 mg/L to natural watercourse or a sewage treatment facility lacking secondary treatment.

.8 Water-borne paints and stains, recycled water-borne surface coatings and water borne varnishes to meet minimum "Environmentally Friendly" [E2] rating.

2.2 COLOURS

.1 Consultant will provide Colour Schedule after Contract award.

.2 Colour schedule will be based upon selection of 1 base colour and 3 accent colours. No more than 4 colours will be selected for entire project and no more than 3 colours will be selected in each area.

.3 Selection of colours will be from manufacturers full range of colours.

.4 Where specific products are available in restricted range of colours, selection based on limited range.

.5 Second coat in three coat system to be tinted slightly lighter colour than top coat to show visible difference between coats, if requested by Departmental Representative

.6 For deep and ultra deep colours; 4 coats may be required.

2.3 MIXING AND TINTING

.1 Perform colour tinting operations prior to delivery of paint to site.

.2 Mix paste, powder or catalyzed paint mixes in accordance with manufacturer's written instructions.

.3 Use and add thinner in accordance with paint manufacturer's recommendations. Do not use kerosene or similar organic solvents to thin water-based paints.

.4 Thin paint for spraying in accordance with paint manufacturer's instructions.

.5 Re-mix paint in containers prior to and during application to ensure break-up of lumps, complete dispersion of settled pigment, and colour and gloss uniformity. Strain as necessary.

2.4 GLOSS/SHEEN RATINGS

.1 Paint gloss shall be defined as the sheen rating of applied paint, in accordance with the following values:

Gloss Level Category	Units @ 60°	Units @ 85º

G1 - Matte Finish (flat)	Max. 5	Max. 10
G2 - Velvet-Like Finish	Max.10	10 to 35
G3 - Eggshell Finish	10 to 25	10 to 35
G4 - Satin-Like Finish	20 to 35	min. 35
G5 - Semi-Gloss Finish	35 to 70	
G6 - Traditional Gloss	70 to 85	
G7 - High Gloss Finish	More than 85	

.2 Gloss level ratings of painted surfaces as indicated and as noted on Finish Schedule.

2.5 INTERIOR PAINTING SYSTEMS

.1 Concrete horizontal surfaces:

.1 INT 3.2C - Epoxy High Build gloss;

.1 On coat Primer/sealer over grinded new concrete surface

.2 Two coats Epoxy floor finish.

.3 Standard of performance: Corotech Waterborne Amine Epoxy V440 by Benjamin Moore with manufacturer's recommended primer.

.2 Structural steel and metal fabrications: where not factory painted: overhead and structural members; columns, beams, joists, etc. and adjacent fabrications.

.1 INT 5.1C - Waterborne dry wall finish.

.1 One coat primer; VOC Limit: 100 g/L

.2 One coat Waterborne Dry Fall MPI #118, VOC Limit: 50 g/L

.3 Metal Fabrications: railings, frames, ladders, support brackets, etc. Selection to be from one of the following:

.1 INT 5.1E - Alkyd Finish:

.1 One coat alkyd metal primer (omit when shop primed), VOC Limit: 100 g/L

.2 Two finish coats VOC compliant alkyd, VOC Limit: 50 g/L

.2 INT 5.1K - Epoxy-modified latex finish.

.1 One coat rust inhibitive primer, VOC Limit: 450 g/L

.2 Two coats epoxy-modified latex, VOC Limit: 50 g/L

.4 Galvanized Metal: miscellaneous overhead steel pipes, decking, ducts, conduit, etc.

.1 INT 5.3H - Waterborne Dry Fall Finish:

.1 One coat VOC compliant primer, VOC Limit: 100 g/L

.2 Two coats Waterborne Dry Fall MPI #133, VOC Limit: 100 g/L

.5 Galvanized Metal: steel doors and frames. Selection to be from one of the following:

.1 INT 5.3L - Alkyd Finish:

.1 One coat VOC compliant non-cementitious primer (omit when shop primed), VOC Limit: 100 g/L

.2 Two finish coats VOC compliant alkyd, VOC Limit: 50 g/L

.2 INT 5.1K - Epoxy-modified latex finish.

.1 One coat rust inhibitive primer, VOC Limit: 450 g/LTwo coats epoxy-modified latex, VOC Limit: 50 g/L

.6 Galvanized Metal: Manufactured heater products.

.1 INT 5.3L - Alkyd Finish:

.1 One coat VOC compliant non-cementitious primer (omit when shop primed), VOC Limit: 100 g/LTwo finish coats VOC compliant alkyd, VOC Limit: 50 g/L

.7 Gypsum Board - Dry Areas: Drywall surfaces, cement board, other wall and ceiling panels inc. wall-mounted equipment to be painted-out.

.1 INT 9.2B - High performance architectural latex (over latex primer) finish:

.1 One coat Latex Primer Sealer, VOC Limit: 100 g/L

.2 Two coats HIPAC Latex, VOC Limit: 50 g/L

.8 Gypsum Board - Wet Areas:

.1 One coat VOC compliant primer compatible with top coat, VOC Limit: 100 g/L, 3rd party TVOC testing required

.2 Two finish coats Pitt-Glaze WB Water Borne Acrylic Epoxy White & Pastel Comp A (Pastel only), VOC Limit: 100 g/L

.9 Dressed Lumber: Interior Finish Carpentry for clear finish:

.1 INT 6.3M – Water based, varnish clear gloss finish

.1 Conversion varnish, coats as required (minimum three), in accordance with NAAWS, system 5

.2 Factory applied

2.6 SOURCE QUALITY CONTROL

.1 Perform following tests on each batch of consolidated post-consumer material before surface coating is reformulated and canned. Testing by laboratory or facility which has been accredited by Standards Council of Canada.

.1 Lead, cadmium and chromium are to be determined using ICP-AES (Inductively Coupled Plasma - Atomic Emission Spectroscopy) technique no. 6010 as defined in EPA SW-846.

.2 Mercury is to be determined by Cold Vapour Atomic Absorption Spectroscopy using Technique no. 7471 as defined in EPA SW-846.

.3 Organochlorines and PCBs are to be determined by Gas Chromatography using Technique no. 8081 as defined in EPA SW-846.

Part 3 Execution

3.1 MANUFACTURER'S INSTRUCTIONS

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

3.2 GENERAL

.1 Perform preparation and operations for interior painting in accordance with MPI Architectural Painting Specifications Manual except where specified otherwise.

.2 Apply paint materials in accordance with paint manufacturer's written application instructions.

3.3 EXAMINATION

.1 Verification of Conditions: verify that conditions of substrate previously installed under other Sections or Contracts are acceptable to be painted in accordance with manufacturer's written instructions.

.1 Visually inspect substrate.

.2 Inform Departmental Representative of unacceptable conditions immediately upon discovery.

.3 Proceed with installation only after unacceptable conditions have been remedied.

.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.

3.4 PREPARATION

.1 Protection (not applicable to new painting work):

.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 Departmental Representative.

.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 (not applicable to new painting work):

.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 Clean and prepare surfaces in accordance with MPI Architectural Painting Specification Manual requirements. Refer to MPI Manual in regard to specific requirements and as follows:

.1 Remove dust, dirt, and other surface debris by vacuuming, wiping with dry, clean cloths or compressed air.

.2 Wash surfaces with a biodegradable detergent [and bleach where applicable] and clean warm water using a stiff bristle brush to remove dirt, oil and other surface contaminants.

.3 Rinse scrubbed surfaces with clean water until foreign matter is flushed from surface.

.4 Allow surfaces to drain completely and allow to dry thoroughly.

.5 Prepare surfaces for water-based painting, water-based cleaners should be used in place of organic solvents.

.6 Use trigger operated spray nozzles for water hoses.

.7 Many water-based paints cannot be removed with water once dried. Minimize use of mineral spirits or organic solvents to clean up water-based paints.

.4 Prevent contamination of cleaned surfaces by salts, acids, alkalis, other corrosive chemicals, grease, oil and solvents before prime coat is applied and between applications of remaining coats. Apply primer, paint, or pretreatment as soon as possible after cleaning and before deterioration occurs.

.5 Where possible, prime non-exposed surfaces of new wood surfaces before installation. Use same primers as specified for exposed surfaces.

.1 Apply sealer to MPI #36 over knots, pitch, sap and resinous areas.

.2 Apply wood filler to nail holes and cracks.

.3 Tint filler to match stains for stained woodwork.

.6 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.

.7 Carried out during shop priming: 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. Remove traces of blast products from surfaces, pockets and corners to be painted by blowing with clean dry compressed air or vacuum cleaning.

.8 Touch up of shop primers with primer as specified.

3.5 APPLICATION

.1 Conform to manufacturer's application instructions unless specified otherwise.

.2 Brush and Roller Application:

.1 Apply paint in uniform layer using brush and/or roller type suitable for application.

.2 Work paint into cracks, crevices and corners.

.3 Paint surfaces and corners not accessible to brush using spray, daubers and/or sheepskins. Paint surfaces and corners not accessible to roller using brush, daubers or sheepskins.

.4 Brush and/or roll out runs and sags, and over-lap marks. Rolled surfaces free of roller tracking and heavy stipple.

.5 Remove runs, sags and brush marks from finished work and repaint.

.3 Spray application:

.1 Provide and maintain equipment that is suitable for intended purpose, capable of atomizing paint to be applied, and equipped with suitable pressure regulators and gauges.

.2 Keep paint ingredients properly mixed in containers during paint application either by continuous mechanical agitation or by intermittent agitation as frequently as necessary.

.3 Apply paint in uniform layer, with overlapping at edges of spray pattern. Back roll first coat application.

.4 Brush out immediately all runs and sags.

.5 Use brushes and rollers to work paint into cracks, crevices and places which are not adequately painted by spray.

.4 Use dipping, sheepskins or daubers only when no other method is practical in places of difficult access.

.5 Apply coats of paint continuous film of uniform thickness. Repaint thin spots or bare areas before next coat of paint is applied.

.6 Allow surfaces to dry and properly cure after cleaning and between subsequent coats for minimum time period as recommended by manufacturer.

.7 Sand and dust between coats to remove visible defects.

.8 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.

.9 Finish closets and alcoves as specified for adjoining rooms.

.10 Finish top, bottom, edges and cutouts of doors after fitting as specified for door surfaces.

.11 Wood, drywall, plaster, stucco, concrete, concrete masonry units and brick; if sprayed, must be back rolled.

3.6 MECHANICAL/ELECTRICAL EQUIPMENT

.1 Paint finished area exposed conduits, piping, hangers, ductwork and other mechanical and electrical equipment with colour and finish to match adjacent surfaces, except as indicated.

.2 Other unfinished areas: leave exposed conduits, piping, hangers, ductwork and other mechanical and electrical equipment in original finish and touch up scratches and marks.

.3 Do not paint over nameplates.

.4 Paint inside of ductwork where visible behind grilles, registers and diffusers with primer and one coat of matt black paint.

.5 Paint disconnect switches for fire alarm system and exit light systems in red enamel.

.6 Paint both sides and edges of backboards for telephone and electrical equipment before installation. Leave equipment in original finish except for touch-up as required, and paint conduits, mounting accessories and other unfinished items.

.7 Do not paint interior transformers and substation equipment.

3.7 SITE TOLERANCES

.1 Walls: no defects visible from a distance of 1000 mm at 90 degrees to surface.

.2 Ceilings: no defects visible from floor at 45 degrees to surface when viewed using final lighting source.

.3 Final coat to exhibit uniformity of colour and uniformity of sheen across full surface area.

3.8 CLEANING

.1 Progress Cleaning: clean in accordance with Section 01 74 00 - 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.

3.9 RESTORATION

.1 Clean and re-install hardware items removed before undertaken painting operations.

.2 Remove protective coverings and warning signs as soon as practical after operations cease.

.3 Remove paint splashings on exposed surfaces that were not painted. Remove smears and spatter immediately as operations progress, using compatible solvent.

.4 Protect freshly completed surfaces from paint droppings and dust. Avoid scuffing newly applied paint.

.5 Restore areas used for storage, cleaning, mixing and handling of paint to clean condition.

END OF SECTION

Part 1 General

1.1 REFERENCES

.1 American Society for Testing and Materials (ASTM)

.1 ASTM A 167-99, Standard Specification for Stainless and Heat-Resisting Chromium-Nickel Steel Plate, Sheet, and Strip.

1.2 SUBMITTALS

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

.2 Indicate size and description of components, base material, surface finish inside and out, hardware and locks, attachment devices, description of rough-in-frame.

.3 Sample for colour selection

1.3 CLOSEOUT SUBMITTALS

.1 Provide maintenance data for accessories for incorporation into manual specified in Section 01 78 00 – Close-Out Submittals.

1.4 EXTRA MATERIALS

.1 Provide special tools required for accessing, assembly/disassembly or removal for toilet and bath accessories

.2 Deliver special tools to Department's Representative.

Part 2 Products

2.1 TOILET PARTITIONS

.1 Acceptable Manufacturers: Bobrick, Bradley, Metpar, equivalent by Global Partitions, or approved alternate.

.2 Solid Phenolic Toilet Partitions: floor – anchored overhead-braced toilet partitions, colour to be selected by Engineer - Architect

2.2 COMPONENTS

.1 Hinges: Heavy duty chrome plated non-ferrous alloy castings

.1 Field adjustable cam to permit door to be fully closed or partially open when compartment is unoccupied.

.2 Theft resistant, one-way stainless steel machine screws into factory-installed metal inserts. Fasteners secured directly into the core are not acceptable.

.3 Mounting brackets: Extruded aluminium alloy, brightened and polished.

.4 Levelling device: 10 mm x 22 mm steel bar welded to 3 mm, steel-reinforcing core, chromate-treated and double zinc-plated.

.5 Pilaster Shoe: Stainless Steel, polished finish, 75 mm high, wraparound design to conceal levelling device.

.6 Headrail (Overhead Braced): extruded, satin finish, anodized aluminium with anti-grip profile.

.7 Door pull suited for out swinging doors, stainless steel.

Part 3 Execution

3.1 INSTALLATION

.1 Ensure supplementary anchorage, if required, is in place.

3.2 ERECTION

.1 Install partitions and screens secure, plumb and square.

.2 Leave 12 mm space between wall and panel or end pilaster.

.3 Anchor mounting brackets to steel framing using crews, to hollow wall using bolts and toggle type anchors.

.4 Attach panel and pilaster to brackets with through type sleeve bolt and nut.

.5 Provide for adjustment of floor variations with screw jack through steel saddles made integral with pilaster. Conceal floor fixings with stainless steel shoes.

.6 Adjust and align hardware for proper function.

.7 Equip out swinging doors with door pulls

.8 Install hardware and accessories to locations shown on drawings and in accordance with Section 10 28 13 – Toilet Accessories.

.9 Floor anchored partition erection.

.1 Attach Pilasters to floor with pilaster supports and level, plumb, and tighten installation with levelling device.

.2 Secure pilaster shoes in position.

END OF SECTION

Part 1 General

1.1 REFERENCES

.1 American Society for Testing and Materials (ASTM)

.1 ASTM A 167-99, Standard Specification for Stainless and Heat-Resisting Chromium-Nickel Steel Plate, Sheet, and Strip.

1.2 SUBMITTALS

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

.2 Indicate size and description of components, base material, surface finish inside and out, hardware and locks, attachment devices, description of rough-in-frame.

1.3 CLOSEOUT SUBMITTALS

.1 Provide maintenance data for accessories for incorporation into manual specified in Section 01 78 00 – Close-Out Submittals.

1.4 EXTRA MATERIALS

.1 Provide special tools required for accessing, assembly/disassembly or removal for toilet and bath accessories

.2 Deliver special tools to Department’s Representative.

Part 2 Products

2.1 ACCEPTABLE MANUFACTURER

.1 Acceptable Manufacturer: Bobrick.

.1 Acceptable Alternate Manufacturers: ASI, Bradley, Gamco, Frost or approved alternate.

.2 Specified acceptable alternate manufacturers must meet performance, functional and physical attributes of specified equipment as determined by Architect.

2.2 WASHROOM COMPONENTS

.1 Soap Dispenser (SD), Stainless Steel, quantity 4.

.1 Acceptable Products: Bobrick B-2111 or approved alternate.

.2 Toilet Tissue Dispenser (TTD), Surface Mounted, Stainless Steel, quantity 5.

.1 Acceptable Products: Bobrick B-2890 or approved alternate.

.3 Paper Towel Dispenser (PTD), Surface Mounted, Stainless Steel, quantity 2.

.1 Acceptable Products: Bobrick B-2974 or approved alternate.

.4 Waste Receptacle (R), Surface Mounted, Stainless Steel, quantity 2.

.1 Acceptable Products: Bobrick B-277 or approved alternate.

.5 Napkin Disposal, Surface Mounted, Stainless steel, quantity 5.

.1 Acceptable products: Bradley Model 4A10 or approved alternate.

.6 Mirror: Surface mounted, stainless steel. Quantity 6.

.1 Acceptable Products: Bobrick B-165 Series or approved alternate.

Part 3 Execution

3.1 INSTALLATION

.1 Install and secure accessories rigidly in place as follows:

.1 Hollow masonry units or existing plaster/drywall: use toggle bolts drilled into cell/wall cavity.

.2 Toilet compartments: use male/female through bolts.

.2 Use tamper proof screws/bolts for fasteners.

.3 Fill units with necessary supplies shortly before final acceptance of building.

.4 Install Hand Dryer, Electrical connection by Division 26.

3.2 SCHEDULE

.1 Locate accessories as per manufacturer recommendations. Exact locations determined by consultant.

.2 Refer to Drawings for quantities unless otherwise indicated.

END OF SECTION

Part 1 General

1.1 RELATED REQUIREMENTS

.1 This section covers items common to all sections of division 22, and 23

1.2 REFERENCES

.1 All codes and standards to be of latest addition.

.2 Contractors are advised that coordination with other trades is required.

.3 Contractors are required to review with other sub contractors the work indicated on architectural, civil, electrical, structural drawings.

1.3 SCOPE OF WORK

.1 The work to be performed under this section consists of the construction of the general mechanical works ventilation, heating, fire protection, controls and plumbing accessories related to the building in accordance with the lines and dimensions shown on the drawings or as described in these specifications or as directed by the Engineer.

.2 The Contractor shall provide all supervision, labour, materials, equipment, machinery, plant and all other items necessary to complete all mechanical systems. This shall include, but not limited to the following:

.1 Plumbing and drainage systems;

.2 Plumbing fixtures;

.3 Hot and cold domestic water piping and related accessories;

.4 Hot water heater;

.5 Valves and fittings;

.6 Air & Water balancing

.7 Ductwork, grilles and diffusers

.8 Space temperature sensors, control valves, temperature sensors, relays and Local control panels;

.3 The Contractor shall provide all supervision, labour, materials, equipment, machinery, plant and all other items necessary to provide start-up/commissioning of all mechanical equipment and related systems/accessories and shall provide all labour, materials, equipment, machinery, plant and all other necessary items to assist activities throughout the commissioning process to verify functionality and intent of all systems and controls.

1.4 PERMITS

.1 In accordance with the General Conditions, obtain and pay for permits, certificate, licenses and other permits as required by municipal, provincial and federal authorities.

.2 Provide appropriate notifications of project to municipal and provincial inspection authorities.

.3 Obtain compliance certificates as prescribed by legislative and regulatory provisions of municipal, provincial and federal authorities as applicable to the performance of work.

.4 Submit to Consultant, copy application forms and approval documents received from above referenced authorities.

1.5 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 and include product characteristics, performance criteria, physical size, finish and limitations.

.3 Shop drawings:

.1 Submit Fire Protection drawings stamped and signed by professional engineer registered or licensed in Newfoundland & Labrador, Canada.

.2 Drawings to show:

.1 Mounting arrangements.

.2 Operating and maintenance clearances.

.3 Drawings and product data accompanied by:

.1 Detailed drawings of bases, supports, and anchor bolts.

.2 Acoustical sound power data, where applicable.

.3 Points of operation on performance curves.

.4 Manufacturer to certify current model production.

.5 Certification of compliance to applicable codes.

.4 Sustainable design submittals:

.1 Submit in accordance to section 01 81 13 – Sustainability Requirements.

1.6 CLOSEOUT SUBMITTALS

.1 Submit in accordance with Section 01 77 00 - Closeout Submittals.

.2 Operation and Maintenance Data: submit operation and maintenance data for incorporation into manual.

.1 Operation and maintenance manual approved by, and final copies deposited with, Consultant before final inspection.

.2 Operation data to include:

.1 Control schematics for systems including environmental controls.

.2 Description of systems and their controls.

.3 Description of operation of systems at various loads together with reset schedules and seasonal variances.

.4 Operation instruction for systems and component.

.5 Description of actions to be taken in event of equipment failure.

.6 Valves schedule and flow diagram.

.7 Colour coding chart.

.3 Maintenance data to include:

.1 Servicing, maintenance, operation and trouble-shooting instructions for each item of equipment.

.2 Data to include schedules of tasks, frequency, tools required and task time.

.4 Performance data to include:

.1 Equipment manufacturer's performance datasheets with point of operation as left after commissioning is complete.

.2 Equipment performance verification test results.

.3 Special performance data as specified.

.4 Testing, adjusting and balancing reports as specified in Section 23 05 93 - Testing, Adjusting and Balancing for Ventilation & 22 05 93 - Testing, Adjusting and Balancing for Plumbing and Heating.

.5 Approvals:

.1 Submit 1 copy of draft Operation and Maintenance Manual to Consultant for approval. Submission of individual data will not be accepted unless directed by Consultant.

.2 Make changes as required and re-submit as directed by Consultant.

.6 Shop drawings:

.1 Provide all Mechanical Shop Drawings for project in O&M manual.

.7 Additional data:

.1 Prepare and insert into operation and maintenance manual additional data when need for it becomes apparent during specified demonstrations and instructions.

.8 Site records:

.1 Consultant will provide 1 set of reproducible mechanical drawings. Contractor to provide sets of white prints as required for each phase of work. Mark changes as work progresses and as changes occur. Include changes to existing mechanical systems, control systems.

.2 Transfer information weekly to reproducible, revising reproducible to show work as actually installed.

.3 Use different colour waterproof ink for each service.

.4 Make available for reference purposes and inspection.

.9 As-Built drawings:

.1 Prior to start of Testing, Adjusting and Balancing for Ventilation, Plumbing and Heating, finalize production of as-built drawings.

.2 Identify each drawing in lower right hand corner in letters at least 12 mm high as follows: "AS BUILT DRAWINGS: THIS DRAWING HAS BEEN REVISED TO SHOW MECHANICAL SYSTEMS AS INSTALLED" (Signature of Contractor) (Date).

.3 Submit to Consultant for approval and make corrections as directed.

.4 Perform testing, adjusting and balancing for Ventilation, Plumbing and Heating using as-built drawings.

.5 Submit completed reproducible as-built drawings with Operating and Maintenance Manuals.

.10 Submit copies of as-built drawings for inclusion in final TAB report.

1.7 MAINTENANCE MATERIAL SUBMITTALS

.1 Submit in accordance with Section 01 77 00 - Closeout Submittals.

.2 Provide one set of special tools required to service equipment as recommended by manufacturers.

.3 Furnish one commercial quality grease gun, grease and adapters to suit different types of grease and grease fittings.

1.8 DELIVERY, STORAGE AND HANDLING

.1 Deliver, store and handle materials in accordance with Section 01 60 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 from nicks, scratches, and blemishes.

.3 Replace defective or damaged materials with new.

.4 Waste disposal in accordance with Section 01 74 19 – Construction Waste Management and Disposal.

1.9 EQUIPMENT INSTALLATION

.1 In accordance with Manufacturer’s instructions unless otherwise indicated.

.2 Install isolation valves and either unions or flanges for isolation and service of each piece of equipment.

1.10 CLEARANCES

.1 Provide space for disassembly, removal of equipment and components as recommended by Manufacturer or as indicated (whichever is greater) without interrupting operation of other system, equipment or components.

.2 Coordinate with Manufacturer Agent, approved shop drawings to provide adequate service space.

1.11 TRIAL USAGE

.1 General

.1 Commissioning requirements in accordance with Section 01 91 13 - General Commissioning (Cx) Requirements.

.2 Engineer - Architect and Commissioning Agent may use equipment and systems for test purpose prior to acceptance. Supply labour, material and instruments required for testing.

.2 Use of systems during construction

.1 Use of mechanical systems during construction may be required by Owner.

.2 Use of new and existing permanent heating; cooling, and ventilation are permitted only under following conditions:

.1 Building has been closed in; areas to be heated/ventilated are clean and will not thereafter be subjected to dust-producing processes.

.2 There is no possibility of damage.

.3 Supply ventilation systems are protected by 60% filters, inspected daily, and changed every 2 weeks or more frequently as required.

.4 Return systems have approved filters over openings, inlets and outlets.

.5 Systems will be:

.1 Operated as per Manufacturer’s recommendations and instructions.

.2 Operated by Contractor.

.3 Monitored continuously by Contractor.

.6 Warranties and Guarantees are not relaxed.

.7 Regular preventive and other Manufacturer’s recommended maintenance routines are performed by Contractor at own expense and under supervision of Departmental representative and Engineer - Architect.

.8 Refurbish entire system before static completion; clean internally and externally, restore to “as-new" condition and replace filters in air system.

.3 Filters specified in this Section are over and above those specified in other Sections of this project.

1.12 REMOVALS

.1 Contractor is responsible for disposal off-site of all items being removed as part of this Contract.

.2 Contractor shall provide Owner with option to keep items being removed as part of this Contract prior to disposal off-site.

1.13 FIRESTOPPING

.1 All fire stopping work is to be coordinated by General Contractor in accordance with Section 07 84 13 - Penetration Firestopping and Section 07 84 43 – Fire-Resistive Joint Systems.

.2 All Sub-Contractors shall coordinate all fire rated assembly penetrations with General Contractor.

.3 Sub-Contractor shall provide required clearances between outside surface of pipe and inside surface of sleeve, core drilled hole or listed fire rated system.

1.14 TESTS

.1 Give 48 hours written notice of date for all tests.

.2 Insulate or conceal work only after testing and approval by Engineer - Architect and Commissioning Agent.

.3 Conduct tests in presence of Engineer - Architect and local authority having jurisdiction where applicable.

.4 Bear costs including retesting and making good.

.5 Equipment: test as specified in relevant sections.

.6 Prior to tests, isolate all equipment or other parts which are not designed to withstand test pressures or test medium.

1.15 INTERPRETATION OF PLANS AND SPECIFICATIONS

.1 These specifications are to be considered as an integral part of the plans which accompany them and neither the plans not the specifications shall be used alone. The drawings are considered an integral part of the specifications. Any item which is omitted in one but which is reasonably implied in the other shall be considered properly and sufficiently specified and must, therefore, be provided by this Contractor

.2 Misinterpretations of the plans or specifications shall not relieve this Contractor of responsibility; final interpretation of details and clauses remains with the Engineer - Architect.

.3 Where uncertainly exists in the passing of pipes and location of equipment, the General Contractor and or project manager shall be consulted before work is started. Where such materials and equipment have been installed so as to cause interference with the inside treatment of the building, they shall be removed and relocated without additional cost to the Owner.

.4 The plans do not necessarily show all valves, duct offsets, access panels, connections, balancing fittings, bases, isolators, flexible connections, drains, etc., and this Contractor shall not avail himself of these obvious omissions, but shall install the work complete in essential details so that it will function properly, can be easily balanced and so that repairs and removal of equipment can easily be made.

.5 Building dimensions shall not be scaled from the Mechanical plans but shall be obtained from on-site dimensions of the building. Any discrepancy between the drawings and the building shall be questioned before proceeding with any installation. The Contractor shall be responsible to confirm on-site dimensions. In existing buildings, confirm dimensions prior to tender.

1.16 CO-OPERATION OF CONTRACTORS

.1 This Contractor shall become familiar with the work of other contractors and in laying out and installing the work shall co-operate with the other Contractors, so

as to facilitate the progress of the work as a whole and avoid interference or delays. Where interference exists, this Contractor shall notify the General Contractor and/or project manager and the Engineer - Architect before installing the work. Any changes in the work or alterations of the Mechanical Contractor's schedule of procedure required for such co-operation will not be considered as a claim for extra compensation.

.2 Due to the complexities of many sub-trades, and the restrictive space available in this project, it is required that all trades co-operate closely so as to install all systems in their allotted locations as indicated on the drawings, or coordination on site.

.3 The drawings are not intended to show all elbows, fittings and offsets required to perform the installation of the work where indicated on drawings. Contractor shall coordinate with all other trades and General Contractor on site. It is the responsibility of the Contractor to review site conditions prior to execution of work. Where services are shown to cross other building services, Contractor shall coordinate with other trades and determine best routing on-site prior to execution of work.

.4 The Contractor shall review all Structural, Mechanical, Electrical and Architectural drawings to determine possible conflicts.

.5 Contractor shall coordinate location of all hangers as to avoid interference with other trades.

.6 No extras will be allowed for lack of coordination or if additional fittings are required to perform the work as shown on the drawings.

1.17 ERRORS AND OMISSIONS

.1 The drawings are not intended to show every item of accessory equipment, but the Contractor shall tender on and install all essential details to provide for efficiency of operation and ease of maintenance.

.2 Should this Contractor discover errors or discrepancies in the plans or specifications, he shall refer the matter to the Engineer - Architect for change or clarification and shall not proceed with that portion of work until advised by the Engineer - Architect to do so.

1.18 MOTOR REQUIRMENTS FOR HVAC EQUIPMENT

.1 General

.1 Electrical motors, for Mechanical equipment and systems specified by Mechanical division.

.2 Mechanical responsibility is specified within these specifications and on mechanical drawings.

.3 Control wiring and conduit is specified in electrical division except for conduit, wiring and connections 120 volt and lower which are related to control systems specified in Controls Division. Refer to Electrical Division for quality of materials and workmanship.

.4 All motors shall be high efficiency type.

.5 All motor shall be CSA listed.

1.19 CONCRETE CURBS AND PADS

.1 Concrete curbs and pads shall be performed by the General Contractor for the Mechanical Subcontractor.

.2 The Mechanical Subcontractor shall provide and coordinate all templates, special cast-in-place feet or mounts and shall lay out the dimensions and locations of the curbs and pads.

1.20 SEQUENCING

.1 This Mechanical Contractor shall allow for the works to be built in the order and manner directed.

1.21 SUPERVISION

.1 This Contractor shall include the services of experienced superintendents, who shall be constantly in charge of the work, together with the qualified journeymen, helpers and labourers, required to properly unload, install, connect, adjust start and operate and test the work involved

1.22 OPENINGS FOR EQUIPMENT

.1 This Contractor shall be responsible for providing openings to allow the installation of all apparatus and large equipment in this Contract. This Contractor shall make all necessary arrangements to ensure that the required openings are provided and properly located.

1.23 MINIMUM REQUIREMENTS

.1 All equipment supplied shall conform to and be labelled by CSA.

.2 All equipment supplied shall be new and first rate production. (No seconds)

1.24 OPENINGS, SLEEVES, CUTTING AND PATCHING

.1 All openings in walls and floors necessary for the installation of equipment of the specification shall be provided by this Contractor.

.2 Openings necessary in structural concrete floor, walls and beams shall be made with Schedule 40 steel sleeves installed prior to pouring of concrete. In floors, extend sleeve min. 50mm (2 in.) above finished floor to permit waterproofing.

.3 Where openings in poured concrete floors or walls are necessary, core drilling only will be permitted.

.4 This Contractor shall advise the Engineer - Architect of all such openings, their size and location and shall obtain his approval prior to cutting of openings.

.5 In fire rated floors or walls, this Contractor shall seal all spaces between piping and sleeve with approved material “FIRESEAL” by 3m or equivalent. Submit 3M shop drawings

1.25 ROOF CUTTING AND PATCHING

.1 All cutting of roof decks and penetrations of roof systems, including flashing, patching, or reinforcing of roofs for all mechanical services extending through roofs shall be done by the General Contractor.

.2 This Contractor shall advise the General Contractor in sufficient advance time, the size and location of all roof openings required.

1.26 MATERIALS AND WORKMANSHIP

.1 All materials installed shall be new, full weight, of the best quality with the same brand or manufacturer used for each class of material or equipment.

.2 All materials and equipment shall be installed in a neat and workmanlike manner by competent specialists for each sub trade. The installation of any materials and equipment

.3 Not meeting these standards may be condemned by the Engineer - Architect and shall be removed and reinstalled at no additional cost to the Owner. This Contractor is responsible for the safety and good condition of the materials and equipment installed until final acceptance by the Owner.

.4 All tradesmen employed by this Contractor for this work shall be properly licensed journeymen and apprentices qualified to do work in each particular trade. The General Contractor shall have the right to examine each man's credentials and order any unqualified personnel away from the project.

1.27 DEFICIENCIES

.1 The Engineer - Architect will notify this Contractor at various intervals of defective workmanship or installation, deficiencies, etc. This Contractor shall not request revised or updated lists without first submitting a current detailed, item by item, report on the status of all deficiencies as reported to the Contractor on a previous listing.

.2 When this Contractor notifies the Engineer - Architect that the contract is ready for interim deficiency review, a comprehensive deficiency listing will be prepared. If such list exceeds twenty (20) items, the contract shall not be considered ready for final inspection and the Engineer - Architect need not furnish the Contractor with such listing.

.3 Contractor shall sign, date, and return to consultant the provided formal deficiency review lists to ensure the items have all been corrected prior to next review.

1.28 SUPPORTS

.1 This Contractor shall supply and erect all structural work necessary for the proper installation and support of all apparatus and equipment under these specifications unless specified in Structural Division. This Contractor shall submit for approval to the Engineer - Architect/Architect shop drawings on all structural supports before installation of same.

1.29 DEFINITIONS

.1 As indicated: Means that the item or items specified are shown on the drawings.

.2 Standard of Acceptance: Means that item named and specified by manufacturer and/or catalogue number forms part of specification and sets standard regarding performance, quality of material and workmanship and when used in conjunction with a reference standard, shall be deemed to supplement the standard.

1.30 EQUIPMENT INSTALLATION

.1 Provide unions and flanges to permit equipment maintenance and disassembly and to minimize disturbance to piping and duct systems and without interfering with building structure or other equipment.

.2 Provide means of access for servicing equipment including permanently lubricated bearings.

.3 Pipe all equipment drains to floor drains.

.4 Line up equipment and similar items with building walls wherever possible.

1.31 ANCHOR BOLTS AND TEMPLATES

.1 Supply anchor bolts and templates for installation by other divisions.

1.32 DIELECTRIC COUPLINGS

.1 Provide wherever pipes of dissimilar metals are joined

1.33 COSTS OF ALTERNATE MATERIALS

.1 Contractor shall bear the cost of all changes required to connect, locate, install, power, control, support or integrate alternate equipment to that specified.

1.34 TEMPORARY STORAGE

.1 This Contractor shall be responsible for materials temporarily stored on site.

1.35 CHANGES & EXTRAS

.1 No change to the drawings and specifications will be accepted, if not authorized in writing by the Architect/Engineer - Architect.

.2 All work carried out which does not conform to the plans and specifications shall be corrected at the Contractor’s expenses.

.3 The Owner reserves the right to change quantity, quality, or any kind of work or equipment described on the drawings or in the specifications without affecting the validity of the contract.

.4 Monetary adjustments required by such changes shall be accepted in writing by the Architect/Engineer - Architect before alterations are proceeded with by the Contractor

1.36 LAWS & ORDINANCES

.1 All work performed under this Division shall comply with the requirements of the authorities having jurisdiction, including, but not limited to, the following: Territorial Department of Labour, Territorial Department of Environment, Dominion Fire Commissioner, Territorial Board of Insurance Underwriters, Territorial Department of Health, Plumbing Inspector, Building Inspector, National Building Code of Canada, Local and Municipal By-Laws and Canadian Standards Association

1.37 WARRANTY

.1 All mechanical work and equipment shall be guaranteed to work satisfactorily for a minimum period of one year from the date of acceptance of substantial completion of the contract, provided any failure is not due to neglect or improper use by the Owner.

.2 Any certificate given, payment made, partial or entire use of the equipment by the Owner, shall not be construed as acceptance of defective work or improper materials.

.3 This general guarantee shall not act as a waiver of any specified guarantee for any greater length of time.

1.38 DAMAGE BY LEAKS

.1 This Contractor shall be responsible for damages to grounds, walks, roads, building, piping systems, electric system and their equipment and contents caused by leaks in the ventilation system being installed. The Contractor shall repair at his expense all damage to incur. All work shall be done as directed by the Owner's representative.

1.39 OPENINGS FOR EQUIPMENT

.1 This Contractor shall be responsible for openings being left to allow the installation of all apparatus and large equipment in this contract. This Contractor shall make all necessary arrangements with the General Contractor to ensure that the required openings are left and properly located. The General Contractor shall be responsible for the tearing out and making good of any walls necessary for the passage of equipment

1.40 STAGING

.1 This Contractor shall supply all staging and equipment necessary for the installation of his work

1.41 LABOUR AND WORKMANSHIP

.1 All tradesmen employed by this Contractor for this work shall be properly licensed journeymen and apprentices qualified to do work in each particular trade. The Architect/Engineer - Architect shall have the right to examine each man's credentials and order any unqualified personnel away from the project.

.2 This Contractor shall be completely responsible for the proper execution of the work as outlined in the plans and specifications. This Contractor shall assume responsibility for workmanship and material defects whether or not they are discovered by the Architect/Engineer - Architect.

1.42 CEILING COORDINATION

.1 Contractor shall refer to architectural drawings for final coordination of all ceiling-installed components, such as diffusers, sprinklers, etc. The Architectural drawings shall govern.

1.43 ALTERNATES: APPROVED EQUALS

.1 Material submitted or installed as substitution for material specified as “Standard of acceptance” shall be considered “alternate:. All approved equals or installed product differing from spec are considered “alternates”.

.2 When the contractor substitutes any alternate for the specified material, he shall assume full responsibility and cost to ensure the mechanical systems operate to the full design intent.

.3 Where such alternate require modified services or connections such as piping, ductwork, devices, electrical, plumbing, drains, or other, the contractor shall at his expense furnish same.

.4 Where such alternate require additional equipment to function properly, contractor shall provide and install and completely look up same at his expense.

1.44 FLOOR PLANS AND SCHEMATICS

.1 Should any pipe size discrepancies or other material discrepancies arise in reviewing floor plans vs. schematics, request clarification from Engineer - Architect.

Part 2 Products

2.1 MATERIALS – NOT USED

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 installation in accordance with manufacturer's written instructions.

.1 Visually inspect substrate in presence of Departmental Representative

.2 Inform Department Representative and Consultant of unacceptable conditions immediately upon discovery.

.3 Proceed with installation only after unacceptable conditions have been remedied and after receipt of written approval to proceed from Departmental Representative and Consultant.

3.2 PAINTING REPAIRS AND RESTORATION

.1 Do painting in accordance with Section 09 91 23 - Interior Painting.

.2 Prime and touch up marred finished paintwork to match original.

.3 Restore to new condition, finishes which have been damaged.

3.3 SYSTEM CLEANING

.1 Clean interior and exterior of all systems including strainers. Vacuum interior of ductwork and air handling units.

3.4 DEMONSTRATION

.1 Consultant and/or Commissioning Agent will use equipment and systems for test purposes prior to acceptance. Supply labour, material, and instruments required for testing.

.2 Supply tools, equipment and personnel to demonstrate and instruct operating and maintenance personnel in operating, controlling, adjusting, troubleshooting and servicing of all systems and equipment during regular work hours, prior to acceptance.

.3 Use operation and maintenance manual, as-built drawings, and audio-visual aids as part of instruction materials.

.4 Instruction duration time requirements as specified in appropriate sections.

.5 Contractor will record these demonstrations on video tape for future reference.

3.5 CLEANING

.1 Progress 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

.3 Waste management in accordance with Section 01 74 19 – Construction Waste Management and Disposal.

3.6 PROTECTION

.1 Protect equipment and systems openings from dirt, dust, and other foreign materials with materials appropriate to system.

3.7 PERMITTING DOCUMENTS

.1 The design drawings are intended to indicate the design requirements to the Contractor. It is the Contractor's responsibility to obtain all construction permits, and approvals from authorities. The Contractor shall be responsible to prepare all necessary sketches, drawings and submission documents required by the authorities in order to issue approvals and permits.

.2 Contractor shall carry all costs associated with permitting 3rd party reviews, witnessing, and inspection.

3.8 OPTIMIZATION

.1 The noted Contractors will provide in his quotation for systems optimization.

.2 The Engineer - Architect's sequences and setpoints specified are intended as a guide designed to create safe, functional and comfortably operating mechanical systems. Each project has a unique set of site conditions which, during start-up and commissioning, will become evident. This Contractor shall allow time for optimizing of setpoints to improve the efficiency of the systems' operations, to lower overall energy use while maintaining the design objectives.

.3 Optimization will require work on behalf of the EMCS and TAB Contractors and coordinated with the Heating and Ventilation Contractors. Each item will be

reviewed with the Design Engineer - Architect before trial and if beneficial, adopted to core operating strategies and incorporated to record documents.

3.9 COMMISSIONING

.1 Contractor shall be responsible to organize and coordinate commissioning activities with their sub-trades, schedule a key personnel, provide all testing equipment required to perform commissioning activities and testing.

.1 Contractor shall be responsible to conduct and report on Contractor start-up (CSP) for all systems under their division.

.2 Contractor shall be responsible for Verification Program (VP) for all equipment and systems under the division.

.3 Contractor shall be responsible to conduct functional testing under performance evaluation (PE) for all equipment and systems under their division.

.4 Contractor shall be responsible to conduct training Owner personnel on all equipment and systems under their division.

.5 Contractor shall be responsible to document all commissioning activities and testing and provide commissioning procedures required to re-commission equipment and systems in the future.

.6 Contractor shall be responsible to collect, organize and turn over all information required to assemble Building Management Manual for the project.

3.10 FIELD QUALITY CONTROL

.1 Manufacturer’s Field Services:

.1 Obtain written report from manufacturers verifying compliance or work, in handling, installing applying protection and cleaning of product and submit Manufacturer’s Field Reports as described in Section 01 33 00 Submitted Procedures AND AS SPECIFIED RESPECTIVE SECTIONS.

.2 Provide manufacturer’s field services consisting of product use recommendations and periodic site visits for inspection of product installation in accordance with manufacturer’s instructions.

.3 Schedule site visits, to review work, as directed in Section 01 40 00 Quality Requirements.

END OF SECTION

Part 1 General

1.1 RELATED REQUIREMENTS

.1 Section 22 05 01 – COMMON WORK RESULTS FOR MECHANICAL

.2 Section 23 05 05 – INSTALLATION OF PIPEWEORK

.3 Section 22 13 17 – DRAINAGE WASTE AND VENT PIPING – CAST IRON AND COPPER

.4 Section 22 13 18 – DRAINAGE WASTE AND VENT PIPING – PLASTIC

.5 Section 22 42 03 – COMMERCIAL FIXTURES

1.2 REFERENCES

.1 American National Standards Institute (ANSI)/American Society of Mechanical Engineers International (ASME)

.1 ANSI/ASME B16.15-06, Cast Bronze Threaded Fittings, Classes 125 and 250.

.2 ANSI/ASME B16.18-01, Cast Copper Alloy Solder Joint Pressure Fittings.

.3 ANSI/ASME B16.22-01, Wrought Copper and Copper Alloy Solder Joint Pressure Fittings.

.4 ANSI/ASME B16.24-01, Cast Copper Alloy Pipe Flanges and Flanged Fittings, Class 150, 300, 400, 600, 900, 1500 and 2500.

.2 ASTM International Inc.

.1 ASTM A307-07b, Standard Specification for Carbon Steel Bolts and Studs, 60,000 PSI Tensile Strength.

.2 ASTM A536-84(2004)e1, Standard Specification for Ductile Iron Castings.

.3 ASTM B88M-05, Standard Specification for Seamless Copper Water Tube (Metric).

.3 American National Standards Institute/American Water Works Association (ANSI)/(AWWA)

.1 ANSI/AWWA C111/A21.11-07, Rubber-Gasket Joints for Ductile-Iron Pressure Pipe and Fittings.

.4 Canadian Standards Association (CSA International)

.1 CSA B242-05, Groove and Shoulder Type Mechanical Pipe Couplings.

.5 Department of Justice Canada (Jus)

.1 Canadian Environmental Protection Act, 1999, c. 33 (CEPA).

.6 Health Canada/Workplace Hazardous Materials Information System (WHMIS)

.1 Material Safety Data Sheets (MSDS).

.7 Manufacturer's Standardization Society of the Valve and Fittings Industry (MSS).

.1 MSS-SP-67-02a, Butterfly Valves.

.2 MSS-SP-70-06, Gray Iron Gate Valves, Flanged and Threaded Ends.

.3 MSS-SP-71-05, Gray Iron Swing Check Valves, Flanged and Threaded Ends.

.4 MSS-SP-80-03, Bronze Gate, Globe, Angle and Check Valves.

.8 National Research Council (NRC)/Institute for Research in Construction

.1 NRCC 38728, National Plumbing Code of Canada (NPC) - 1995.

.9 Transport Canada (TC)

.1 Transportation of Dangerous Goods Act, 1992, c. 34 (TDGA).

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 datasheets for insulation and adhesives, and include product characteristics, performance criteria, physical size, finish and limitations.

.3 Closeout Submittals:

.1 Provide maintenance data for incorporation into manual specified in Section 01 77 00 - Closeout Submittals.

Part 2 Products

2.1 PIPING

.1 Domestic hot, cold and recirculation systems, within building.

.1 Above ground: copper tube, hard drawn, type L: to ASTM B88M.

.2 Buried or embedded: copper tube, soft annealed, type K: to ASTM B88M, in long lengths and with no buried joints.

.3 Crosslinked polyethylene (PEX) to CSA B137.10 or CSA B137-9 or CSA B137.5, ASTM F1281 and NSF may be used above grade for run-outs to fixtures only, above grade in non return air plenum ceilings only. **All risers and horizontal mains shall be copper.**

.1 When PEX piping is used in exposed applications fit entire length of exposed pipe with pipe-manufacturer’s metal snap on pipe cover and fastened to Unistrut support with pipe-manufacturer’s pipe clips. Use rubber guards between clip and pipe

.2 Use copper long sleeve 90° supports for PEX piping leaving walls for fixture supplies so that all piping leaving walls is copper

2.2 FITTINGS

.1 Bronze pipe flanges and flanged fittings, Class 150: to ANSI/ASME B16.24.

.2 Cast bronze threaded fittings, Class 125: 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: ANSI/ASME B16.18 or ANSI/ASME B16.22 roll grooved to CSA B242. Manufactured to copper-tube dimensions. (Flaring of tube or fitting ends to accommodate alternate sized couplings is not permitted.)

.6 NPS 1 and smaller: wrought copper to ANSI/ASME B16.22 cast copper to ANSI/ASME B16.18; with 301 stainless steel internal components and EPDM seals. Suitable for operating pressure to 1380 kPa.

.7 NPS 2 and smaller: Precision, cold drawn, stainless steel with elastomer O-ring seals, suitable for working pressure to 3450-kPa. Standard of Acceptance: Victaulic Vic-Press for Schedule 10S Pipe.

.8 All fittings shall be UL classified in accordance with NSF-61 for potable water service. The system shall meet the low-lead requirements of NSF-372.

2.3 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 tin copper alloy.

.4 Teflon tape: for threaded joints.

.5 Grooved couplings: designed with angle bolt pads to provide rigid joint at copper-tube dimensions, complete with EPDM-HP gasket. Installation-ready, suitable for direct stab installation without field disassembly. Standard of Acceptance: Victaulic Style 607H.

.6 Dielectric connections between dissimilar metals:

.1 dielectric fitting, complete with thermoplastic liner.

.2 Copper silicon casting conforming to UNS C87850 with grooved and/or threaded ends. Basis of Design: Victaulic Series 647.

.3 UL classified in accordance with NSF-61 for potable water service, and shall meet the low-lead requirements of NSF-372.

.7 All pipe joints for Pex piping to be jointing systems as supplied by pipe manufacturer. Do not join Pex piping below floor.

2.4 VALVES

.1 Except for specialty valves, to be single manufacturer.

.2 Products to have CRN registration numbers.

.3 End Connections:

.1 Connection into adjacent piping/tubing:

.1 NPS 2 and under:

.1 Steel pipe systems: screwed ends to ANSI/ASME B1.20.1.

.2 Copper tube systems: solder ends or grooved ends to ANSI/ASME B16.18.

.2 NPS 2 1/2 and larger:

.1 Flanged ends.

.4 Lockshield Keys:

.1 Where lockshield valves are specified, provide 10 keys of each size: malleable iron cadmium plated.

.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 Standard of acceptance: Crane Fig.1.

.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 150:

.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 2-1/2 and up, flanged:

.1 To MSS SP-71, Class 125, 860 kPa, cast iron body, FF flange, regrind renewable seat, bronze disc, bolted cap.

.4 NPS 2 to 4 for roll grooved end pipe:

To MSS SP-71, Class 125, 860 kPa, malleable or ductile iron body, bronze or stainless steel discs, stainless steel spring, stainless steel shaft, EPDM seat.

.3 Acceptable Manufacturer (or approved equal):

.1 Crane

.2 Jenkins

.3 Watts

.4 Apollo

.5 Kitz

.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.

.7 Acceptable Manufacturer (or approved equal):

.1 Crane

.2 Jenkins

.3 Watts

.4 Apollo

.5 Kitz

.2 NPS 2-1/2 and over:

.1 Class 125, 860 kPa, cast steel, wafer style, bronze trim, stainless spring heavy duty spring in vertical down flow application.

.3 NPS 4 and over, for roll grooved end pipe:

.1 To MSS SP-71, Class 125, 860 kPa, malleable or ductile iron body, bronze or stainless steel discs, EPDM seat.

.4 Standard of Acceptance: Victaulic Series 716 and Series W715.

.5 Acceptable Manufacturer (or approved equal):

.1 Crane

.2 Jenkins

.3 Watts

.4 Apollo

.5 Kitz

.8 Ball Valves:

.1 NPS 2 and under:

.1 Body and cap: cast high tensile bronze to ASTM B62.

.2 Pressure rating: Class125 WOG 2760-kPa CWP 4140-kPa CWP, 860 kPa steam.

.3 Connections: screwed ends to ANSI B1.20.1 and with hexagonal shoulders solder ends to ANSI/ASME 16.18.

.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.

.2 Acceptable Manufacturer (or approved equal):

.1 Crane 9202 or 9222,

.2 Jenkins 201SJ or 202 SJ,

.3 Watts B-6000 or B-6001,

.4 Red & White 5044A or 5049A,

.5 Kitz 58 or 59,

.6 Apollo 77C series

.7 Victaulic Series P569.

.8 For Aquatherm or Aquarise piping use compatible valves from respective pipe manufacturers.

.9 Butterfly Valves:

.1 NPS 2-1/2 and over, lug body:

.1 To MSS SP-67, Class 150, 1 MPa WOG, cast iron or semi-steel body, stainless steel or bronze disc, stainless steel stem, replaceable EPDM liner and nylon coated ductile iron seat, locking handle.

.2 Operators:

.1 NPS 2 1/2 to 4: locking type lever handle.

.2 NPS 2-1/2 and over wafer body:

.1 To MSS SP-67, Class 150, 1 MPa WOG cast iron or semi-steel body, stainless steel or bronze disc, stainless steel stem, replaceable EPDM liner and nylon coated ductile iron seat, locking handle.

.2 Operators:

.1 NPS 2 1/2 to 4: locking type lever handle as indicated.

.2 NPS 6 and over: gear operator.

.3 NPS 2.1/2 and over, grooved ends:

.1 To MSS SP-67, 300 psig bubble tight shut-off, ductile iron body to ASTM A536, steel body, EPDM, disc coated for temperature and service, stainless steel trunnion and drive hub.

.2 Operator:

.1 NPS 2.1/2 to 6: locking type lever handle.

.2 NPS 8 and over: Gear operator.

.4 Acceptable Material (or approved equal):

.1 Victaulic VIC-300 MasterSeal and AGS-Vic300.

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 Authorities Having Jurisdiction and the National Plumbing Code of Canada.

.2 Install pipe work in accordance with Section 23 05 05 - Installation of Pipework, supplemented as specified herein.

.3 Assemble piping using fittings manufactured to ANSI 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 Grooved joint couplings and fittings shall be installed in accordance with the manufacturer’s written installation instructions. Grooved ends shall be clean and free from indentations, projections, and roll marks in the area from pipe end to groove. Gaskets shall be verified as suitable for the intended service prior to installation. Gaskets shall be molded and produced by the coupling manufacturer. The grooved coupling manufacturer’s factory trained representative shall provide on-site training for contractor’s field personnel in the use of grooving tools, application of groove, and installation of grooved joint products. The manufacturer’s representative shall periodically visit the jobsite and review installation. Contractor shall remove and replace any joints deemed improperly installed.

.7 Buried tubing:

.1 Lay in well compacted washed sand in accordance with AWWA Class B bedding.

.2 Bend tubing without crimping or constriction. Minimize use of fittings.

3.3 VALVES

.1 Isolate equipment, fixtures and branches with valves as per plans.

.2 Balance recirculation system using circuit balancing valves. Mark settings and record on as-built drawings on completion.

3.4 PRESSURE TESTS

.1 Conform to requirements of Section 22 05 01 - Common Work Results for Mechanical.

.2 Test pressure: greater of 1 times maximum system operating pressure or 860 kPa.

3.5 FLUSHING AND CLEANING

.1 Flush entire system for 8 h. Ensure outlets flushed for 2 hours. Let stand for 24 hours, then draw onesample off longest run. Submit to testing laboratory to verify that system is clean to Provincial and Federal potable water guidelines. Let system flush for additional 2 hours, then draw off another sample for testing.

3.6 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 pressure booster systems are operating properly.

.4 Ensure that air chambers, expansion compensators are installed properly.

3.7 DISINFECTION

.1 Flush out, disinfect and rinse system to requirements of authority having jurisdiction.

.2 Upon completion, provide laboratory test reports on water quality for Consultant approval.

3.8 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 Bring HWS storage tank up to design temperature slowly.

.4 Monitor piping HWS and HWC piping systems for freedom of movement, pipe expansion as designed.

.5 Check control, limit, safety devices for normal and safe operation.

.4 Rectify start-up deficiencies.

3.9 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 TAB HWC in accordance with Section 22 05 93 - Testing, Adjusting and Balancing for HVAC.

.3 Adjust pressure regulating valves while withdrawal is maximum and inlet pressure is minimum.

.4 Sterilize HWS and HWC systems for Legionella control.

.5 Verify performance of temperature controls.

.6 Verify compliance with safety and health requirements.

.7 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.

.8 Confirm water quality consistent with supply standards, and ensure no residuals remain as result of flushing or cleaning.

.3 Reports:

.1 Include certificate of water flow and pressure tests conducted on incoming water service, demonstrating adequacy of flow and pressure.

3.10 OPERATION REQUIREMENTS

.1 Co-ordinate operation and maintenance requirements including, cleaning and maintenance of specified materials and products with Section 23 05 05 – Installation of Pipework.

3.11 CLEANING

.1 Clean in accordance with general requirements.

END OF SECTION

Part 1 General

1.1 RELATED REQUIREMENTS

.1 Section 22 05 01 – COMMON WORK RESULTS FOR MECHANICAL

.2 Section 23 05 05 – INSTALLATION OF PIPEWORK

1.2 REFERENCES

.1 ASTM International Inc.

.1 ASTM B32-08, Standard Specification for Solder Metal.

.2 ASTM B306-02, Standard Specification for Copper Drainage Tube (DWV).

.3 ASTM C564-03a, Standard Specification for Rubber Gaskets for Cast Iron Soil Pipe and Fittings.

.2 Canadian Standards Association (CSA International).

.1 CSA B67-1972(R1996), Lead Service Pipe, Waste Pipe, Traps, Bends and Accessories.

.2 CAN/CSA-B70-06, Cast Iron Soil Pipe, Fittings and Means of Joining.

.3 CAN/CSA-B125.3-05, Plumbing Fittings.

.3 South Coast Air Quality Management District (SCAQMD), California State

.1 SCAQMD Rule 1168-A2005, Adhesive and Sealant Applications.

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 datasheets for adhesives, and include product characteristics, performance criteria, physical size, finish and limitations.

1.4 DELIVERY, STORAGE AND HANDLING

.1 Deliver, store and handle in accordance with Section 01 60 00 - Common Product Requirements.

.2 Deliver materials to site in original factory packaging, labelled with manufacturer's name, address.

Part 2 Products

2.1 COPPER TUBE AND FITTINGS

.1 Above ground condensate drainage, Type DWV to: ASTM B306.

.1 Fittings.

.1 Cast brass: to CAN/CSA-B125.3.

.2 Wrought copper: to CAN/CSA-B125.3.

.2 Solder: lead free, tin-95:5, type TA to ASTM B32.

2.2 CAST IRON PIPING AND FITTINGS

.1 Buried sanitary, storm and vent minimum NPS 3 and any kitchen or steam service drainage, to: CAN/CSA-B70.

.1 Joints:

.1 Hub and spigot:

.1 Caulking lead: to CSA B67.

.2 Cold caulking compounds.

.2 Above ground sanitary, storm and vent: to CAN/CSA-B70.

.1 Joints:

.1 Hub and spigot:

.1 Caulking lead: to CSA B67.

.2 Mechanical joints:

.1 Neoprene or butyl rubber compression gaskets with stainless steel clamps.

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 In accordance with Section 22 05 05 - Installation of Pipework.

.2 Install in accordance with National Plumbing Code of Canada.

3.3 TESTING

.1 Pressure test buried systems before backfilling.

.2 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 that cleanout rods can probe as far as the next cleanout, at least.

.2 Test to ensure traps are fully and permanently primed.

.3 Storm water drainage:

.1 Verify domes are secure.

.2 Ensure weirs are correctly sized and installed correctly.

.3 Verify provisions for movement of roof system.

.4 Ensure that fixtures are properly anchored, connected to system and effectively vented.

.5 Affix applicable label (storm, sanitary, vent, pump discharge etc.) c/w directional arrows every floor or 4.5 m (whichever is less).

3.5 CLEANING

.1 Clean in accordance with general requirements.

END OF SECTION

Part 1 General

1.1 RELATED REQUIREMENTS

.1 Section 22 05 01 – COMMON WORK RESULTS FOR MECHANICAL

.2 Section 23 05 05 – INSTALLATION OF PIPEWORK

1.2 REFERENCES

.1 ASTM International Inc.

.1 ASTM D2235-04, Standard Specification for Solvent Cement for Acrylonitrile-Butadiene-Styrene (ABS) Plastic Pipe and Fittings.

.2 ASTM D2564-04e1, Standard Specification for Solvent Cements for Poly(Vinyl-Chloride) (PVC) Plastic Piping Systems.

.2 Canadian Standards Association (CSA International)

.1 CAN/CSA-Series B1800-06, Thermoplastic Nonpressure Pipe Compendium - B1800 Series.

.3 Green Seal Environmental Standards (GSES)

.1 Standard GS-36-00, Commercial Adhesives.

.4 South Coast Air Quality Management District (SCAQMD), California State

.1 SCAQMD Rule 1168-A2005, Adhesive and Sealant Applications.

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 datasheets for piping and adhesives, and include product characteristics, performance criteria, physical size, finish and limitations.

1.4 DELIVERY, STORAGE AND HANDLING

.1 Deliver, store and handle in accordance with Section 01 60 00 - Common Product Requirements.

.2 Deliver materials to site in original factory packaging, labelled with manufacturer's name, address.

.3 Store at temperatures and conditions recommended by manufacturer.

Part 2 Products

2.1 MATERIAL

.1 Adhesives and Sealants: in accordance with Section 07 92 00 - Joint Sealants.

2.2 PIPING AND FITTINGS

.1 PVC-DWV

.1 Certified to **CSA B181.2**, made to Schedule 40 thickness

.2 Exhibits a Flame Spread Rating of not greater than 25 as per ULC S102.2 test methods.

.3 Size range 38.1mm-610mm.

.4 Permitted inside a building; above ground, underground and part of the building sewer system. Not permitted for use in Air Plenum, Vertical Service Spaces and High-Rise Buildings.

.5 To ensure the full integrity of the completed system, all components shall be supplied by one manufacturer.

.6 Approved manufacturer or equal.

.1 Ipex System 15

.2 XFR DWV

.1 Certified to **CSA B181.2** and made to Schedule 40 thickness.

.2 System XFR listed to ULC S102.2 to exhibit a Flame Spread Rating of not greater than 25 as well as a Smoke Developed Classification of not greater than 50. Permissible for use in High-Rise Buildings and Air Plenums as per NBCC.

.3 System XFR DWV is <u>not</u> permitted in Vertical Service Space. Permitted inside a building, above grade in return air plenums.

.4 To ensure the full integrity of the completed system, all components shall be supplied by one manufacturer. Mixed use of multiple manufacturer brands of pipe and fittings would make the Flame and Smoke listings invalid

.5 Approved manufacturer or equal.

.1 Ipex System XFR

.3 PVC SDR-35

.1 Pipe certified to CSA B182.2

.2 Conform to ASTM D3034, ASTM F679, BNQ 3624-130 and BNQ 3624-135 standards.

.3 Pipe stiffness must be 320kpa (46psi) for DR35 and 625kpa (90psi) for DR28.

.4 Permitted buried inside a building.

.5 Approved manufacturer or equal.

.1 Ipex

.4 ABS-DWV

.1 Pipe to be certified to CSA B181.1

.2 Available in nominal sizes from 32 to 150mm.

.3 Permitted inside building underground only.

.4 Approved manufacturer or equal.

.1 Ipex

.5 BDS PVC

.1 BDS manufactured to B182.1 **WILL NOT BE ACCEPTED.**

2.3 JOINTS

.1 Solvent Cementing

.1 Cements shall be CSA certified and meet the requirements of ASTM D2564 for PVC and ASTM D2235 for ABS.

.2 Clean all joints with ABS or PVC - Cleaner

.3 All work carried out to CSA Standard B181.1-M90 and B181.2-M90 recommended practice for the installation of ABS or PVC DWV pipe fittings

.4 One-Step Cement may be used for sizes 32 to 150mm only.

.5 For sizes 8" to 24", PVC-DWV (Ipex - System 15) and Ipex- XFR -Two-Step cement must be used in conjunction with PVC-DWV (Ipex - System 15) and Ipex XFR primer.

.6 Consideration may also be given to the use of pressure cement for sizes over 300mm.

.7 Proper solvent cementing procedures must be followed at all times.

.8 Approved manufacturer or equal.

.1 Ipex

.2 PVC-DWV & XFR DWV

.1 MJ GreyTM Couplings

.1 MJ Grey Couplings are a mechanical joint assembly suitable for use on PVC-DWV (IPEX System 15) or System XFR DWV piping sizes 200mm through 300mm, are certified to CSA B602 and are listed to ULC S102.2 to exhibit a Flame/Smoke rating of 25/50

.3 PVC SDR-35

.1 Gaskets certified to CSA B182.2 and conform to ASTM D3034, ASTM F679, BNQ 3624-130 and BNQ 3624-135 standards Injection-mold gasketed PVC fittings shall be certified to CSA B182.1 or CSA B182.2. Fabricated fittings must conform to CSA B182.2 and ASTM F679. Sealing gaskets shall meet the requirements of CSA B182.2 and ASTM F477 and pipe joints shall withstand 345kpa (50psi) hydrostatic pressure.

.4 ABS-DWV

.1 Fittings to be certified to CSA B181.1 and is available in nominal sizes from 32mm to 150mm.

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 In accordance with Section 22 05 05 - Installation of Pipework.

.2 Install in accordance with National Plumbing Code, Provincial Plumbing Code and local authority having jurisdiction.

.3 Solvent Cementing

.1 To make consistently good joints, the following points should be clearly understood and followed.

.1 The joining surfaces must be softened and made semi-fluid.

.2 Sufficient cement must be applied to fill the gap between pipe and fitting.

.3 Assembly of pipe and fittings must be made while the surfaces are still wet and cement is still fluid.

.4 Joint strength develops as the cement dries. In the tight part of the joint the surfaces will tend to fuse together; in the loose part, the cement will bond to both surfaces.

.5 It is recommended that installers verify for themselves that they can make satisfactory joints under varying conditions.

.6 It is recommended that the installers received personal instruction from trained instructor or experienced installers. Contact your local manufacture or supplier for additional information and or instruction.

3.3 TESTING

.1 Pressure test buried systems before backfilling.

.2 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 Ensure fixtures are properly anchored, connected to system and effectively vented.

.4 Affix applicable label (storm, sanitary, vent, pump discharge) c/w directional arrows every floor or 4.5 m (whichever is less).

3.5 CLEANING

.1 Clean in accordance with General Requirements.

.1 Remove surplus materials, excess materials, rubbish, tools and equipment.

END OF SECTION

Part 1 General

1.1 RELATED REQUIREMENTS

.1 Section 22 05 01 – COMMON WORK RESULTS FOR MECHANICAL

.2 Section 22 11 16 – DOMESTIC WATER PIPING.

.3 Section 22 13 18 – DRAINAGE WASTE AND VENT PIPING - PLASTIC.

1.2 REFERENCES

.1 Canadian Standards Association (CSA International)

.1 CAN/CSA-B45 Series-02(R2008), Plumbing Fixtures.

.2 CAN/CSA-B125.3-05, Plumbing Fittings.

.3 CAN/CSA-B651-12, Accessible Design for the Built Environment.

.2 Green Seal Environmental Standards (GSES)

.1 Standard GS-36-00, Commercial Adhesives.

.3 South Coast Air Quality Management District (SCAQMD), California State

.1 SCAQMD Rule 1168-A2005, Adhesive and Sealant Applications.

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 datasheets for washroom fixtures, and include product characteristics, performance criteria, physical size, finish and limitations.

.3 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): minimum pressure required for flushing.

1.4 CLOSEOUT SUBMITTALS

.1 Provide operation and maintenance data for washroom fixtures, for incorporation into manual specified in Section 01 77 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.

1.5 DELIVERY, STORAGE AND HANDLING

.1 Deliver, store and handle in accordance with Section 01 60 00 - Common Product Requirements.

.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 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 WC-1: Water Closet Flush Valves:

.1 Floor mounted flushometer valve toilet

.2 Bowl: vitreous china, direct-fed siphon jet action, condensation channel, elongated bowl, meets definition of HET (high efficiency toilet), 4.8lpf, 38 m top spud connection.

.3 Seat: Heavy duty for elongated bowl, open front, white solid plastic, less cover, reinforced stainless steel check hinges.

.4 Rim height for barrier-free water closets to be suitable for accessible applications

.5 Acceptable material:

.1 American Standard

.2 Sloan

.3 Zurn

.4 Kohler

.8 WC-2: Water Closet Tank type:

.1 Floor mounted, tank type, vitrous china, everclean antimicrobial surface, raised sanitary bar and four points tank stabilization, two piece, lined tank, oversized flush valve, with flapper, metal shank fill valve, floor outlet, bolt caps. Water consumption 4.8L per flush. Tank with tamperproof locking device.

.2 Seat: Heavy duty for elongated bowl, open front, white solid plastic, less cover, reinforced stainless steel check hinges.

.3 Toilet supply: chrome plated polished brass, commercial duty ¼ turn ball valve angle stops, escutcheons, flexible copper riser.

.4 Floor flange: same material as connection pipe, brass bolts, rubber gasket.

.5 Acceptable material:

.1 American Standard

.2 Sloan

.3 Zurn

.4 Kohler

.9 LAV-1: Countertop sink barrier free

.1 Vitreous china to CSA B45, concealed three hole front overflow, unglazed rim 508 mm x 432 mm, faucet holes on 100 mm centres, bowel dimensions: 464 mm x 406 mm x 216 mm deep nominal dimensions, ADA Compliant.

.2 Trim: 100 mm centers, cast brass construction, 1.9 LPM, aerator spray outlet, ADA compliant, ceramic disc valve cartridges, pressure compensating spray, lever handles minimum length 100 mm.

.3 Fixture piping: Hot and cold water supplies to fixture. Chrome plated flexible supply pipes to each with screwdriver stop, reducers, escutcheon.

.4 Waste fitting: open grid drain, chrome plated cast brass one piece top, 32 mm tailpiece. Offset trap for barrier free.

.5 .5 Acceptable Material:

.1 American Standard

.2 Zurn

.3 Sloan

.6 Acceptable Trim material:

.1 American Standard

.2 Zurn

.3 Delta

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 manufacturer's recommendations & as per architectural

.2 Wall-hung fixtures: to manufacturer's recommendations & as per architectural

.3 Barrier free: to manufacturer's recommendations, National Building Code requirements & as per architectural

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.

.3 Checks:

.1 Water closets, 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 Clean in accordance with General Requirements

.1 Remove surplus materials, excess materials, rubbish, tools and equipment.

END OF SECTION

Part 1 General

1.1 RELATED REQUIREMENTS

.1 Section 22 05 01 – COMMOM WORK RESULTS FOR MECHANICAL

.2 Section 22 11 16 DOMESTIC WATER PIPING

.3 Section 22 13 17 DRAINAGE WASTE AND VENT PIPING - CAST IRON AND COPPER

.4 Section 22 13 18 DRAINAGE WASTER AND VENT PIPING – PLASTIC

.5 Section 23 05 53.01 MECHANICAL INDENTIFICATION

.6 Section 23 05 29 HANGER AND SUPPORTS FOR HVAC PIPING

.7 Section 23 07 15 THERMAL INSULATION FOR PIPING

.8 Section 23 08 01 PERFORMANCE VERIFICATION MECHANICAL PIPING SYSTEMS

.9 Section 23 21 23.02 HYDRONIC SYSTEMS – STEEL

1.2 REFERENCES

.1 Canadian General Standards Board (CGSB)

.1 CAN/CGSB-1.181-99, Ready-Mixed Organic Zinc-Rich Coating.

.2 Canadian Standards Association (CSA International)

.1 CSA B139-04, Installation Code for Oil Burning Equipment.

.3 Green Seal Environmental Standards (GSES)

.1 Standard GS-11-2008, 2nd Edition, Environmental Standard for Paints and Coatings.

.4 National Fire Code of Canada (NFCC 2005)

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, specifications and datasheets for piping and equipment 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 61 00 - Common Product Requirements 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 Execution

2.1 APPLICATION

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

2.2 CONNECTIONS TO EQUIPMENT

.1 In accordance with manufacturer's instructions unless otherwise indicated.

.2 Use valves and either unions or flanges for isolation and ease of maintenance and assembly.

.3 Use double swing joints when equipment mounted on vibration isolation and when piping subject to movement.

2.3 CLEARANCES

.1 Provide clearance around systems, equipment and components for observation of operation, inspection, servicing, maintenance and as recommended by manufacturer.

.2 Provide space for disassembly, removal of equipment and components as recommended by manufacturer and as indicated without interrupting operation of other system, equipment, components.

2.4 DRAINS

.1 Install piping with grade in direction of flow except as indicated.

.2 Install drain valve at low points in piping systems, at equipment and at section isolating valves.

.3 Pipe each drain valve discharge separately to above floor drain.

.1 Discharge to be visible.

.4 Drain valves: NPS 3/4 gate or globe valves unless indicated otherwise, with hose end male thread, cap and chain.

.5 Pipe all equipment drains to nearest FFD..

2.5 DIELECTRIC COUPLINGS

.1 General: compatible with system, to suit pressure rating of system.

.2 Locations: where dissimilar metals are joined.

.3 NPS 2 and under: isolating unions or bronze valves.

2.6 PIPEWORK INSTALLATION

.1 Screwed fittings jointed with Teflon tape.

.2 Protect openings against entry of foreign material.

.3 Install to isolate equipment and allow removal without interrupting operation of other equipment or systems.

.4 Assemble piping using fittings manufactured to ANSI standards.

.5 Saddle type branch fittings may be used on mains if branch line is no larger than half size of main.

.1 Hole saw (or drill) and ream main to maintain full inside diameter of branch line prior to welding saddle.

.6 Install exposed piping, equipment, rectangular cleanouts and similar items parallel or perpendicular to building lines.

.7 Install concealed pipework to minimize furring space, maximize headroom, conserve space.

.8 Slope piping, except where indicated, in direction of flow for positive drainage and venting.

.9 Install, except where indicated, to permit separate thermal insulation of each pipe.

.10 Group piping wherever possible and as indicated.

.11 Ream pipes, remove scale and other foreign material before assembly.

.12 Use eccentric reducers at pipe size changes to ensure positive drainage and venting.

.13 Provide for thermal expansion as indicated.

.14 Valves:

.1 Install in accessible locations.

.2 Remove interior parts before soldering.

.3 Install with stems above horizontal position unless indicated.

.4 Valves accessible for maintenance without removing adjacent piping.

.5 Install globe valves in bypass around control valves.

.6 Use ball valves at branch take-offs for isolating purposes except where specified.

.7 Install plug cocks or ball valves for glycol service.

.8 Provide valve handle extensions to access valve handlers beyond pipe insulation.

.15 Check Valves:

.1 Install silent check valves on discharge of pumps in vertical pipes with downward flow and as indicated.

.2 Install swing check valves in horizontal lines as indicated.

2.7 SLEEVES

.1 General: install where pipes pass through masonry, concrete structures, fire rated assemblies, and as indicated.

.2 Material: schedule 40 black steel pipe.

.3 Construction: use annular fins continuously welded at mid-point at foundation walls and where sleeves extend above finished floors.

.4 Sizes: 6 mm minimum clearance between sleeve and uninsulated pipe or between sleeve and insulation.

.5 Installation:

.1 Concrete, masonry walls, concrete floors on grade: terminate flush with finished surface.

.2 Other floors: terminate 25 mm above finished floor.

.3 Before installation, paint exposed exterior surfaces with heavy application of zinc-rich paint to CAN/CGSB-1.181.

.6 Sealing:

.1 Foundation walls and below grade floors: fire retardant, waterproof non-hardening mastic.

.2 Elsewhere:

.1 Provide space for firestopping.

.2 Maintain fire rating integrity.

.3 Sleeves installed for future use: fill with lime plaster or other easily removable filler.

.4 Ensure no contact between copper pipe or tube and sleeve.

2.8 ESCUTCHEONS

.1 Install on pipes passing through walls, partitions, floors, and ceilings in finished areas.

.2 Construction: one piece type with set screws.

.1 Chrome or nickel plated brass or type 302 stainless steel..

.3 Sizes: outside diameter to cover opening or sleeve.

.1 Inside diameter to fit around pipe or outside of insulation if so provided.

2.9 PREPARATION FOR FIRE STOPPING

.1 Install firestopping within annular space between pipes, ducts, insulation and adjacent fire separation in accordance with Section 07 84 13 - Penetration Fire Stopping.

.2 Uninsulated unheated pipes not subject to movement: no special preparation.

.3 Uninsulated heated pipes subject to movement: wrap with non-combustible smooth material to permit pipe movement without damaging fires topping material or installation.

.4 Insulated pipes and ducts: ensure integrity of insulation and vapour barriers.

2.10 FLUSHING OUT OF PIPING SYSTEMS

.1 Flush system in accordance with Section 22 08 02 - Cleaning and Start-up of Mechanical Piping Systems and as per the National Plumbing Code.

.2 Before start-up, clean interior of piping systems in accordance with requirements of Section 22 08 02 - Cleaning and Start-up of Mechanical Piping Systems supplemented as specified in relevant mechanical sections.

.3 Preparatory to acceptance, clean and refurbish equipment and leave in operating condition, including replacement of filters in piping systems.

2.11 PRESSURE TESTING OF EQUIPMENT AND PIPEWORK

.1 Advise Consultant 48 hours minimum prior to performance of pressure tests.

.2 New hydronic piping shall be pressure tested in isolation from existing system.

.3 Pipework: test as specified in relevant sections of heating, ventilating and air conditioning work.

.4 Maintain specified test pressure without loss for 4 hours minimum unless specified for longer period of time in relevant mechanical sections and provide written confirmation to Consultant.

.5 Prior to tests, isolate equipment and other parts which are not designed to withstand test pressure or media.

.6 Pay costs for repairs or replacement, retesting, and making good. Consultant to determine whether repair or replacement is appropriate.

.7 Insulate or conceal work only after approval and certification of tests by Consultant.

2.12 EXISTING SYSTEMS

.1 Connect into existing piping systems at times approved by Departmental Representative.

.2 Request written approval by Departmental Representative 10 days minimum, prior to commencement of work.

.3 Be responsible for damage to existing heating system by this work.

2.13 CLEANING

.1 Clean in accordance with Section general requirements.

.1 Remove surplus materials, excess materials, rubbish, tools and equipment.

END OF SECTION

Part 1 General

1.1 RELATED REQUIREMENTS

.1 Section 22 05 01 COMMON WORK RESULTS FOR MECHANICAL

.2 Section 22 11 16 DOMESTIC WATER PIPING.

.3 Section 22 05 05 INSTALLATION OF PIPEWORK.

1.2 REFERENCES

.1 American National Standards Institute (ANSI)/American Society of Mechanical Engineers (ASME)

.1 ANSI/ASME B1.20.1-1983(R2006), Pipe Threads, General Purpose (Inch).

.2 ANSI/ASME B16.18-2001, Cast Copper Alloy Solder Joint Pressure Fittings.

.2 ASTM International

.1 ASTM A276-08, Standard Specification for Stainless Steel Bars and Shapes.

.2 ASTM B62-02, Standard Specification for Composition Bronze or Ounce Metal Castings.

.3 ASTM B283-08a, Standard Specification for Copper and Copper Alloy Die Forgings (Hot-Pressed).

.4 ASTM B505/B505M-08a, Standard Specification for Copper-Base Alloy Continuous Castings.

.3 Manufacturers Standardization Society of the Valve and Fittings Industry, Inc. (MSS)

.1 MSS-SP-25-1998, Standard Marking System for Valves, Fittings, Flanges and Unions.

.2 MSS-SP-80-2008, Bronze Gate Globe, Angle and Check Valves.

.3 MSS-SP-110-1996, Ball Valves, Threaded, Socket-Welding, Solder Joint, Grooved and Flared Ends.

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 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.

1.4 CLOSEOUT SUBMITTALS

.1 Provide maintenance data for incorporation into manual specified in Section 01 78 00 - Closeout Submittals.

1.5 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.
  - .2 Include following:
    - .1 Lubricant gun for expansion joints.

1.6 DELIVERY, STORAGE AND HANDLING

.1 Deliver, store and handle materials in accordance with Section 01 61 00 - Common Product Requirements 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 NPS 2 and under:
    - .1 Steel pipe systems: screwed ends to ANSI/ASME B1.20.1.
    - .2 Copper tube systems: solder ends or grooved ends to ANSI/ASME B16.18.
  - .2 NPS 2 1/2 and larger:
    - .1 Flanged ends.

.3 Lockshield Keys:

- .1 Where lockshield valves are specified, provide 10 keys of each size: malleable iron cadmium plated.

.4 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 Standard of acceptance: Crane Fig.1.

.5 Check Valves:

.1 Requirements common to check valves, unless specified otherwise:

.1 Standard specification: MSS SP-80.

.2 Connections: screwed with hexagonal shoulders.

.2 Acceptable Manufacturer (or approved equal):

.1 Crane

.2 Jenkins

.3 Watts

.4 Apollo
.5 Kitz

.6 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.
.7 Acceptable Manufacturer (or approved equal):

.1 Crane
.2 Jenkins
.3 Watts
.4 Apollo
.5 Kitz

.7 Ball Valves:

.1 NPS 2 and under:

.1 Body and cap: cast high tensile bronze to ASTM B62.
.2 Pressure rating: Class125 WOG 2760-kPa CWP 4140-kPa CWP, 860 kPa steam.
.3 Connections: screwed ends to ANSI B1.20.1 and with hexagonal shoulders solder ends to ANSI/ASME 16.18.
.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.

.2 Acceptable Manufacturer (or approved equal):

.1 Crane 9202 or 9222,
.2 Jenkins 201SJ or 202 SJ,
.3 Watts B-6000 or B-6001,
.4 Red & White 5044A or 5049A,
.5 Kitz 58 or 59,
.6 Apollo 77C series
.7 Victaulic Series P569.
.8 For Aquatherm or Aquarise piping use compatible valves from respective pipe manufacturers.

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.

3.2 CLEANING

.1 Clean in accordance with general requirements.

.1 Remove surplus materials, excess materials, rubbish, tools and equipment.

END OF SECTION

Part 1 General

1.1 SUMMARY

.1 **RELATED REQUIREMENTS**

.1 Section 22 05 01 – COMMOM WORK RESULTS FOR MECHANICAL

.2 Section 22 11 16 DOMESTIC WATER PIPING.

.3 Section 22 13 17 DRAINAGE WASTE AND VENT PIPING - CAST IRON AND COPPER.

.4 Section 23 21 13.02 - HYDRONIC SYSTEMS- STEEL.

1.2 REFERENCES

.1 American Society of Heating, Refrigeration and Air Conditioning Engineers (ASHRAE)

.1 ASHRAE Standard 90.1-01, Energy Standard for Buildings Except Low-Rise Residential Buildings (IESNA co-sponsored; ANSI approved; Continuous Maintenance Standard).

.2 American Society for Testing and Materials International (ASTM)

.1 ASTM B209M-04, Standard Specification for Aluminum and Aluminum Alloy Sheet and Plate Metric.

.2 ASTM C335-04, Standard Test Method for Steady State Heat Transfer Properties of Horizontal Pipe Insulation.

.3 ASTM C411-04, Standard Test Method for Hot-Surface Performance of High-Temperature Thermal Insulation.

.4 ASTM C449/C449M-00, Standard Specification for Mineral Fiber-Hydraulic-Setting Thermal Insulating and Finishing Cement.

.5 ASTM C533-2004, Calcium Silicate Block and Pipe Thermal Insulation.

.6 ASTM C547-2003, Mineral Fiber Pipe Insulation.

.7 ASTM C795-03, Standard Specification for Thermal Insulation for Use in Contact with Austenitic Stainless Steel.

.8 ASTM C921-03a, Standard Practice for Determining the Properties of Jacketing Materials for Thermal Insulation.

.3 Canadian General Standards Board (CGSB)

.1 CGSB 51-GP-52Ma-89, Vapour Barrier, Jacket and Facing Material for Pipe, Duct and Equipment Thermal Insulation.

.2 CAN/CGSB-51.53-95, Poly (Vinyl Chloride) Jacketting Sheet, for Insulated Pipes, Vessels and Round Ducts

.3 CGSB 51.9-92, Mineral Fibre Thermal Insulation for Piping and Round Ducting.

.4 Department of Justice Canada (Jus)

.1 Canadian Environmental Assessment Act (CEAA), 1995, c. 37.

.2 Canadian Environmental Protection Act (CEPA), 1999, c. 33.

.3 Transportation of Dangerous Goods Act (TDGA), 1992, c. 34.

.5 Health Canada/Workplace Hazardous Materials Information System (WHMIS)

.1 Material Safety Data Sheets (MSDS).

.6 Manufacturer's Trade Associations

.1 Thermal Insulation Association of Canada (TIAC): National Insulation Standards (Revised 2004).

.7 Underwriters' Laboratories of Canada (ULC)

.1 CAN/ULC-S102-03, Surface Burning Characteristics of Building Materials and Assemblies.

.2 CAN/ULC-S701-01, Thermal Insulation, Polystyrene, Boards and Pipe Covering.

.3 CAN/ULC-S702-1997, Thermal Insulation, Mineral Fibre, for Buildings

.4 CAN/ULC-S702.2-03, Thermal Insulation, Mineral Fibre, for Buildings, Part 2: Application Guidelines.

1.3 DEFINITIONS

.1 For purposes of this section:

.1 "CONCEALED" - insulated mechanical services in suspended ceilings and non-accessible chases and furred-in spaces.

.2 "EXPOSED" - will mean "not concealed" as specified.

.2 TIAC ss:

.1 CRF: Code Rectangular Finish.

.2 CPF: Code Piping Finish.

1.4 ACTION AND INFORMATIONAL SUBMITTALS

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

.2 Product Data:

.1 Submit manufacturer's printed product literature, specifications and datasheet in accordance with Section01 33 00 - Submittal Procedures. Include product characteristics, performance criteria, and limitations.

.1 Submit two copies of Workplace Hazardous Materials Information System (WHMIS) Material Safety Data Sheets (MSDS) in accordance with Section 01 33 00 - Submittal Procedures.

.3 Shop Drawings:

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

1.5 QUALITY ASSURANCE

.1 Qualifications:

.2 Installer: specialist in performing work of this Section, and have at least 3 years successful experience in this size and type of project, qualified to standards and member of TIAC.

.3 Health and Safety:

.1 Do construction occupational health and safety in accordance with Section 01 35 29.06 - Health and Safety Requirements.

1.6 DELIVERY, STORAGE AND HANDLING

.1 Packing, shipping, handling and unloading:

.1 Deliver, store and handle in accordance with manufacturer's written instructions and Section 01 60 00 - Common Product Requirements.

.2 Deliver, store and handle materials in accordance with manufacturer's written instructions.

.3 Deliver materials to site in original factory packaging, labelled with manufacturer's name, address.

.2 Storage and Protection:

.1 Protect from weather, construction traffic.

.2 Protect against damage.

.3 Store at temperatures and conditions required by manufacturer.

Part 2 Products

2.1 FIRE AND SMOKE RATING

.1 In accordance with CAN/ULC-S102.

.1 Maximum flame spread rating: 25.

.2 Maximum smoke developed rating: 50.

2.2 INSULATION

.1 Mineral fibre 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 A-1: rigid moulded mineral fibre without factory applied vapour retarder jacket.

.1 Mineral fibre: to CAN/ULC-S702 ASTM C547.

.2 Maximum "k" factor: to ANSI/ASHRAE/IES 90.1 - 2016.

.3 Accepted Manufacturer (or approved equal):

.1 John Manville

.2 Fibrex

.3 Mason AK Board

.4 Industrial Insulation Group, LLC

.4 TIAC Code A-3: rigid moulded mineral fibre with factory applied vapour retarder jacket.

.1 Insulation: to CGSB 51.9-92

.2 Mineral fibre: to CAN/ULC-S702 ASTM C547.

.3 Jacket: to CGSB 51-GP-52Ma.

.4 Maximum "k" factor: to ANSI/ASHRAE/IES 90.1 - 2016.Accepted Manufacturer (or approved equal):

.1 John Manville

.2 Fibrex

.3 Mason AK Board

.4 Industrial Insulation Group, LLC

.5 TIAC Code C-2: mineral fibre blanket faced with factory applied vapour retarder jacket (as scheduled in PART 3 of this section).

.1 Mineral fibre: to CAN/ULC-S702 ASTM C547.

.2 Jacket: to CGSB 51-GP-52Ma.

.3 Maximum "k" factor: toANSI/ASHRAE/IES 90.1 - 2016. .

.6 TIAC Code A-6: flexible unicellular tubular elastomer.

.1 Insulation: with vapour retarder jacket.

.2 Jacket: to CGSB 51-GP-52Ma.

.3 Maximum "k" factor: To ANSI/ASHRAE/IES 90.1 - 2016.

.4 Certified by manufacturer: free of potential stress corrosion cracking corrodants.

2.3 INSULATION SECUREMENT

.1 Tape: self-adhesive, aluminum, reinforced, 50 mm wide minimum.

.2 Contact adhesive: quick setting.

.3 Canvas adhesive: washable.

.4 Tie wire: 1.5 mm diameter stainless steel.

.5 Bands: stainless steel, 19mm wide, 0.5 mm thick.

2.4 CEMENT

.1 Thermal insulating and finishing cement:

.1 Hydraulic setting on mineral wool, to ASTM C449/C449M.

2.5 VAPOUR RETARDER LAP ADHESIVE

.1 Water based, fire retardant type, compatible with insulation.

2.6 INDOOR VAPOUR RETARDER FINISH

.1 Vinyl emulsion type acrylic, compatible with insulation.

2.7 OUTDOOR VAPOUR RETARDER FINISH

.1 Vinyl emulsion type acrylic, compatible with insulation.

.2 Reinforcing fabric: fibrous glass, untreated 305 g/m^2.

2.8 JACKETS

.1 Polyvinyl Chloride (PVC):

.1 One-piece moulded type to CAN/CGSB-51.53 with pre-formed shapes as required.

.2 Colours – to match existing adjacent.

.3 Maximum service temperature: 65 degrees C.

.4 Moisture vapour transmission: 0.02 perm.

.5 Thickness: 0.5 mm.

.6 Fastenings:

.1 Use solvent weld adhesive compatible with insulation to seal laps and joints.

.2 Tacks.

.3 Pressure sensitive vinyl tape of matching colour.

.7 Special requirements:

.1 Indoor: n/a

.2 Outdoor: UV rated material at least 0.5 mm thick.

.2 Aluminum:

.1 To ASTM B209.

.2 Thickness: 0.50 mm sheet.

.3 Finish: stucco embossed.

.4 Joining: longitudinal and circumferential slip joints with 50 mm laps.

.5 Fittings: 0.5 mm thick die-shaped fitting covers with factory-attached protective liner.

.6 Metal jacket banding and mechanical seals: stainless steel, 19 mm wide, 0.5mm thick at 300 mm spacing.

2.9 WEATHERPROOF CAULKING FOR JACKETS INSTALLED OUTDOORS

.1 Caulking to: Section 07 92 00 - Joint Sealants.

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 PRE-INSTALLATION REQUIREMENT

.1 Pressure testing of piping systems and adjacent equipment to be complete, witnessed and certified.

.2 Surfaces 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 this specification.

.3 Use two layers with staggered joints when required nominal wall thickness exceeds 75 mm.

.4 Maintain uninterrupted continuity and integrity of vapour retarder jacket and finishes.

.1 Install hangers, supports outside vapour retarder jacket.

.5 Supports, Hangers:

.1 Apply high compressive strength insulation, suitable for service, at oversized saddles and shoes where insulation saddles have not been provided.

3.4 REMOVABLE, PRE-FABRICATED, INSULATION AND ENCLOSURES

.1 Application: Install at all expansion joints, valves, primary flow measuring elements, flanges and unions at equipment.

.2 Installation: to permit movement of expansion joint and to permit periodic removal and replacement without damage to adjacent insulation.

3.5 INSTALLATION OF ELASTOMERIC INSULATION

.1 Insulation to remain dry. Overlaps to manufacturers instructions. Ensure tight joints.

.2 Provide vapour retarder as recommended by manufacturer.

3.6 PIPING INSULATION SCHEDULES

.1 Includes valves, valve bonnets, strainers, flanges and fittings unless otherwise specified.

.2 TIAC Code: A-1.

.1 Securements: Tape at 300 mm on centre.

.2 Seals: lap seal adhesive, lagging adhesive.

.3 Installation: TIAC Code 1501-H.

.3 TIAC Code: A-3.

.1 Securements: Tape at 300 mm on centre.

.2 Seals: VR lap seal adhesive, VR lagging adhesive.

.3 Installation: TIAC Code: 1501-C.

.4 TIAC Code: A-6.

.1 Insulation securements: SS bands to manufacture recommendations.

.2 Seals: lap seal adhesive, lagging adhesive.

.3 Installation: TIAC Code: _____.

.5 TIAC Code: C-2 with without vapour retarder jacket.

.1 Insulation securements: Glue for cold/wet service.

.2 Seals: lap seal adhesive, lagging adhesive.

.3 Installation: TIAC Code: 1501-C.

.6 TIAC Code: A-2.

.1 Insulation securements: tape.

.2 Seals: lap seal adhesive, lagging adhesive.

.3 Installation: TIAC Code: 1501-H.

.7 Thickness of insulation as listed in following table.

.1 Run-outs to individual units and equipment not exceeding 4000 mm long.

.2 Do not insulate exposed runouts to plumbing fixtures, chrome plated piping, valves, fittings.

Application	Temp degrees C	TIAC code	Pipe sizes (NPS) and insulation thickness (mm)					
			Up to 1	1 1/4 to 2	2 1/2 to 4	5 to 6	8	up to 175
Hot Water Heating	60 - 94	A-1	25	50	50	50	50	50
Hot Water Heating	up to 59	A-1	25	25	38	25	38	38
Domestic HWS/HWR		A-1	25	25	38	38	38	38
Domestic CWS		A-3	25	25	25	25	25	25
Domestic CWS with vapour retarder		C-2	25	25	25	25	25	25

.8 Finishes:

.1 Exposed & Concealed indoors: PVC jacket.

.2 Exposed in mechanical rooms: PVC jacket

.3 Use vapour retarder jacket on TIAC code A-3 insulation compatible with insulation.

.4 Outdoors: water-proof aluminum jacket.

.5 Finish attachments: SS bands, at 150 mm on centre. Seals: closed.

.6 Installation: to appropriate TIAC code CRF/1 through CPF/5.

3.7 CLEANING

.1 Proceed in accordance with General Requirements

.2 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 RELATED REQUIREMENTS

.1 Section 23 05 05 - Installation of Pipework.

1.2 REFERENCES

.1 American Society for Testing and Materials International (ASTM)

.1 ASTM E202-[04], Standard Test Methods for Analysis of Ethylene Glycols and Propylene Glycols.

1.3 CLEANING AND START-UP OF MECHANICAL PIPING SYSTEMS

.1 In accordance with Section [23 08 02 - Cleaning and Start-up of Mechanical Piping Systems].

1.4 POTABLE WATER SYSTEMS

.1 When cleaning is completed and system filled:

.1 Verify performance of equipment and systems as specified elsewhere in Division 22.

.2 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 recharge air chambers. Repeat for each outlet and flush valve.

.3 Confirm water quality consistent with supply standards, verifying that no residuals remain resulting from flushing and/or cleaning.

1.5 SANITARY DRAINAGE SYSTEMS

.1 Buried systems: perform tests prior to back-filling. Perform hydraulic tests to verify grades and freedom from obstructions.

.2 Ensure that traps are fully and permanently primed.

.3 Ensure that fixtures are properly anchored, connected to system.

.4 Operate flush valves, tank and operate each fixture to verify drainage and no leakage.

.5 Cleanouts: refer to Section [22 42 00 - Plumbing Fixtures].

.6 Roof drains:

.1 Refer to Section [22 42 01 - Plumbing Specialties and Accessories].

.2 Remove caps as required.

1.6 REPORTS

.1 In accordance with Section [01 91 13 - General Commissioning (Cx) Requirements]: Reports, supplemented as specified herein.

.2 .

Part 2 Products

2.1 NOT USED

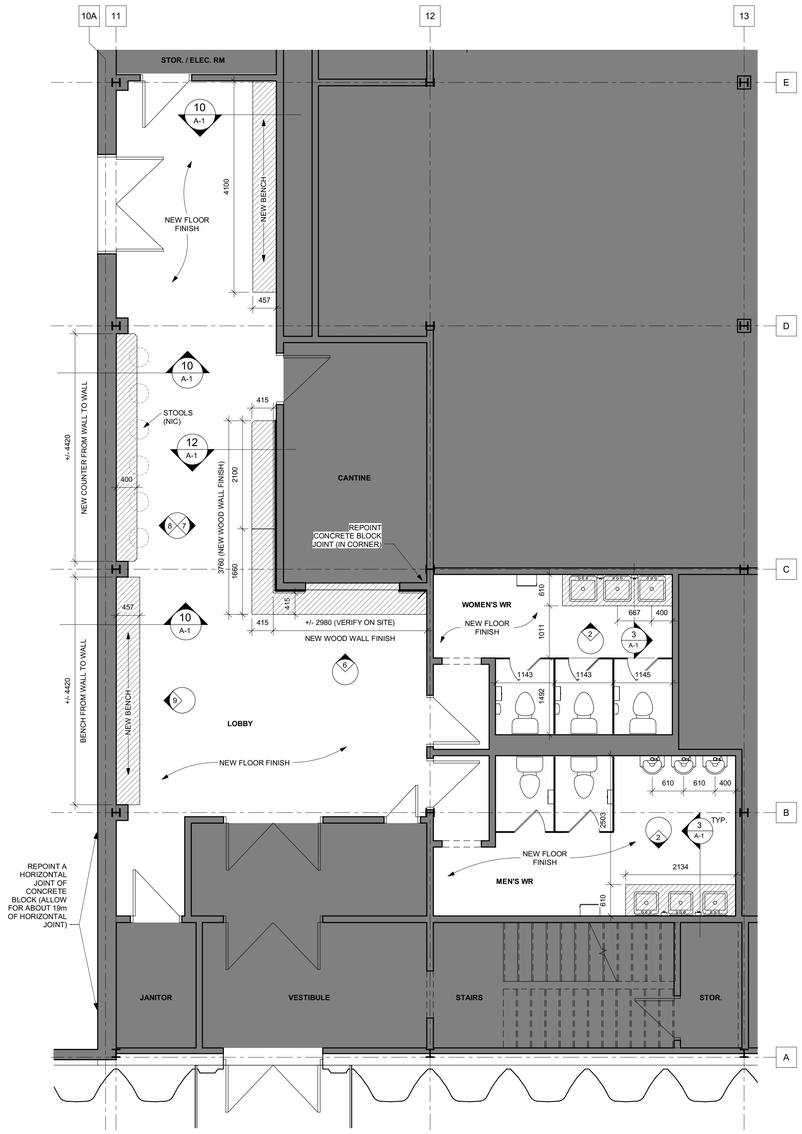
.1 Not used.

Part 3 Execution

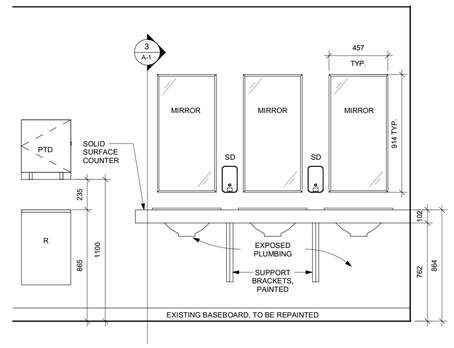
3.1 NOT USED

.1 Not used.

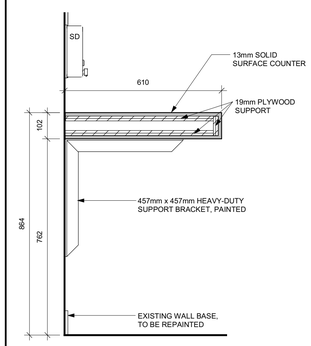
END OF SECTION



1 A-1 ZONE 1 - ARENA LOBBY - NEW CONSTRUCTION FLOOR PLAN
1 : 50



2 A-1 TYPICAL PUBLIC WASHROOM SINK ELEVATION
1 : 20



3 A-1 TYPICAL PUBLIC WASHROOM SINK SECTION
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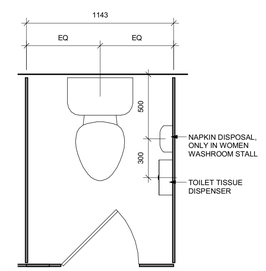

4 A-1 TYPICAL WASHROOM STALL
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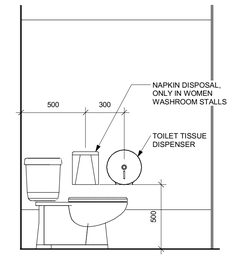

5 A-1 TYP. WASHROOM STALL ELEVATION
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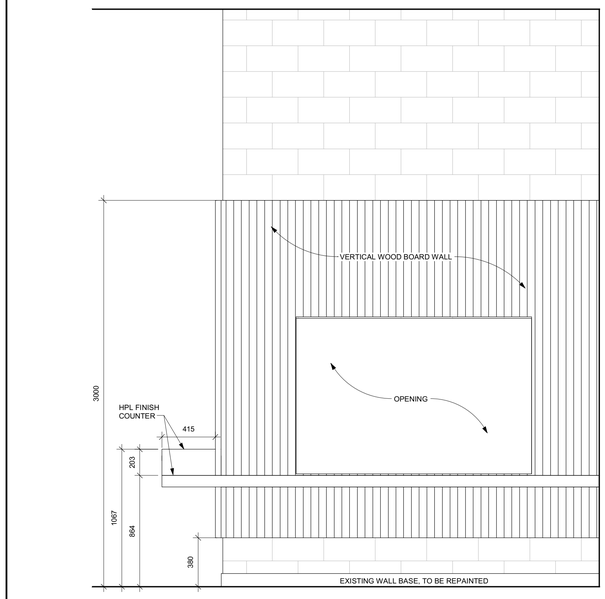

6 A-1 CANTEEN TRANSACTION COUNTER ELEVATION
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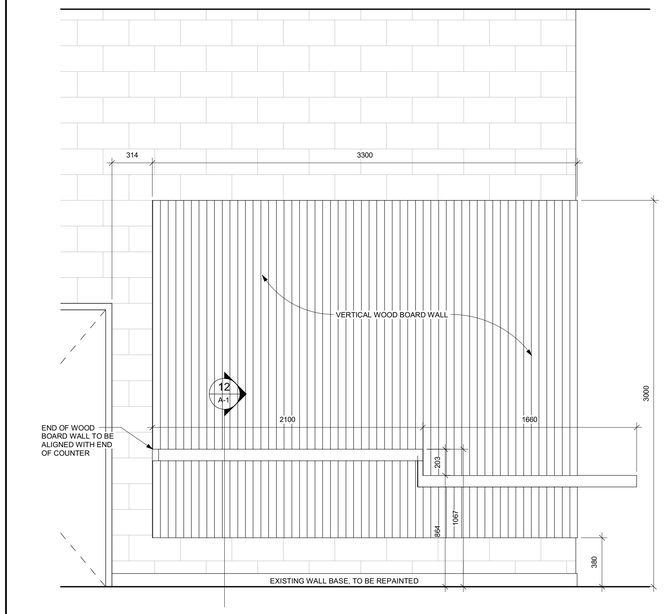

7 A-1 CANTEEN RAISED COUNTER ELEVATION
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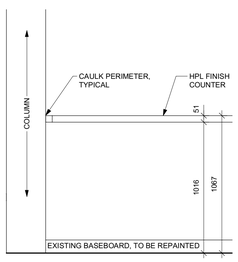

8 A-1 RAISED COUNTER ELEVATION
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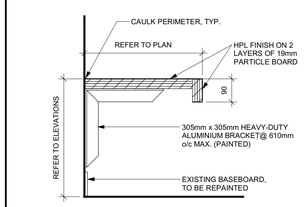

10 A-1 TYP. WALL MOUNTED COUNTER & BENCH SECTION
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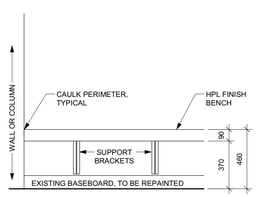

9 A-1 TYP. BENCH ELEVATION
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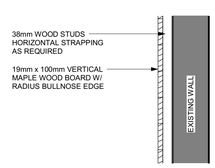
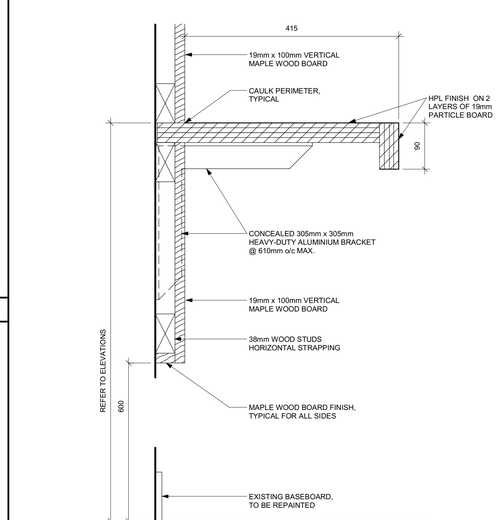


11 A-1 WOOD BOARD WALL PLAN DETAIL
1 : 10



12 A-1 TYP. CANTEEN COUNTER SECTION
1 : 5

LEGEND

- EQUIPMENT / FURNITURE (NIC)
- EXISTING DOOR
- NEW CASEWORK

NIC	NOT IN CONTRACT
HPL	HIGH PRESSURE LAMINATE
SD	SOAP DISPENSER
PTD	PAPER TOWEL DISPENSER
R	WASTE RECEPTACLE
TTD	TOILET TISSUE DISPENSER

DEMOLITION NOTES

NOTE 1 - BENCHES TO BE REMOVED AND TURNED OVER TO CLIENT

NOTE 2 - CASEWORK & COUNTERS TO BE REMOVED

NOTE 3 - CANTEEN COUNTER TO BE REMOVED

NOTE 4 - WASHROOM VANITIES, FIXTURES, AND FINISHES TO BE COMPLETELY DEMOLISHED AND MAKE READY TO RECEIVE NEW FINISHES

NOTE 5 - WASHROOM PARTITION TO BE REPLACED. MATCH EXISTING DIMMENSIONS.

GENERAL NOTES

- THE GENERAL CONTRACTOR IS RESPONSIBLE TO COORDINATE ALL WORK WITH RELATED SUB-TRADES FOR DEPRESSIONS, DOOR, WINDOW, AND EQUIPMENT OPENINGS, INSERTS AND ITEMS TO BE BUILT INTO FOUNDATION, FOOTINGS, SLABS, AND WALLS AND NEW EQUIPMENT/SYSTEMS INSTALLATIONS. THE CONTRACTOR SHALL BE AWARE THAT EXISTING SITE CONDITIONS MAY REQUIRE SOME DEVIATION FROM THE DETAILS OF CONSTRUCTION AS SHOWN IN THESE DOCUMENTS.

- THE GENERAL CONTRACTOR IS RESPONSIBLE TO PATCH AND REPAIR ALL AREAS DAMAGED DURING WORK, TO MATCH ADJACENT CONSTRUCTION. SUCH AREAS INCLUDE, BUT ARE NOT LIMITED TO FLOORS, WALLS AND CEILINGS WHERE NEW ELECTRICAL AND MECHANICAL DEVICES ARE INSTALLED, THE GENERAL CONTRACTOR SHALL FAMILIARIZE THEMSELVES WITH ELECTRICAL/MECHANICAL & STRUCTURAL DRAWINGS TO DETERMINE THE EXTENT OF SUCH WORK.

- ALL DIMENSIONS ARE TO BE CONFIRMED ON SITE BEFORE STARTING WORK. REPORT ANY DISCREPANCIES TO THE ARCHITECT/ENGINEERS.

- ALL PENETRATIONS AND JUNCTIONS AT FIRE RATED WALLS, FLOORS, CEILINGS OR ROOFS ARE TO BE SEALED WITH FIRESTOP MATERIAL.

- ALL OTHER PENETRATIONS AND JUNCTIONS AT WALLS, FLOOR & CEILINGS ARE TO BE SEALED WITH CAULKING FOR A CLEAN FINISH

NOTES

1. NEW BASEBOARDS THROUGHOUT WHEREVER NEW FLOOR FINISH IS INSTALLED.
2. PATCH AND REPAIR ANY HOLES OR DEVIATIONS IN ALL WALLS AND MAKE READY FOR NEW PAINT, THROUGHOUT ZONE1. (COORDINATE THE EXTENT OF SUCH WORK WITH CLIENT).
3. PATCH AND REPAIR ALL AREAS DAMAGED DUE TO DEMOLITION AND MAKE GOOD TO RECEIVE NEW FINISH.
4. ALL FLOORING FINISHES TO BE REMOVED (UNLESS NOTED OTHERWISE), MAKE GOOD TO RECEIVE NEW FINISH.
5. PROVIDE SOLID BACKING FOR ALL FIXTURES, EQUIPMENT AND MILLWORK, AS REQUIRED PER MANUFACTURERS RECOMMENDATIONS.
6. ALL DOORS AND FRAMES TO RECEIVE NEW PAINT FINISH, THROUGHOUT ZONE 1.
7. EXISTING BASEBOARD TO REMAIN: PATCH AND MAKE GOOD TO RECEIVE NEW PAINT FINISH.
8. NEW FLOOR FINISH TO BE RUBBER SPORT MAT AND TO BE INSTALLED THROUGHOUT ZONE 1.

NOTES

NO.	DATE	REVISIONS	BY	APPR.
1	2022-07-12	ISSUED FOR TENDER		

DESIGN PLUS ARCHITECTURE

DP_19028

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97 TROOP AVVENUE
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PROJECT TITLE

ARNAITOK ARENA

N.B.

DRAWING TITLE

FLOOR PLAN, PUBLIC WASHROOMS & LOBBY CASEWORK

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	Checked By	Cadd Check
	LG	
	Sheet	of

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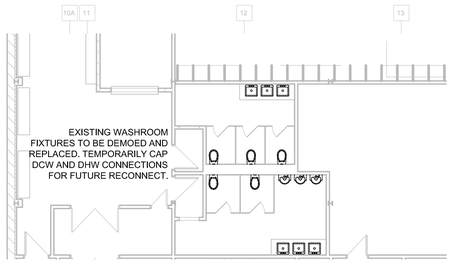
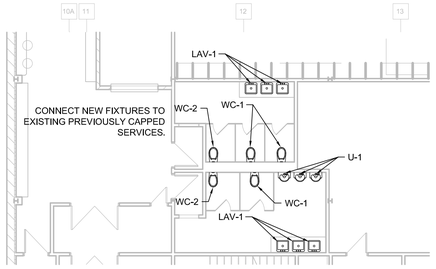


1 - PARTIAL PLAN
WASHROOM GROUP DEMO
1:100



2 - PARTIAL PLAN
WASHROOM GROUP NEW
1:100

PLUMBING FIXTURE SCHEDULE

No.	MODEL	PIPE SIZE				REMARKS
		DCW	DHW	SAN	VENT	
WC-1	4.8 LPF - B.F. FLOOR MOUNTED FLUSH VALVE WATER CLOSET	25	-	75	50	
WC-2	4.8 LPF - B.F. ELONGATED VITREOUS CHINA, FLOOR MOUNTED, C/W PRESSURE ASSIST TANK, BOLTED COVER, FLANGE BOLTS BOLT CAPS, FLOOR FLANGE & GASKET.	12	-	75	50	
U-1	B.F. ULTRA LOW FLOW URINAL	12	-	50	38	
LAV-1	B.F. COUNTERTOP SINK	12	12	32	32	(D) 33T260 GRID STRAINER, OFFSET TAILPIECE AND CONCEALED ARM CARRIER

ACCEPTABLE PRODUCTS:
WATER CLOSETS: (AS)-AMERICAN STANDARD, (KO)-KOHLER, (S)-SLOAN, (Z) - ZURN
LAV-1: SINKS: (AS)-AMERICAN STANDARD, (KO)-KOHLER, (S)-SLOAN, (Z)-ZURN
WASTE: (D)-DELTA, (McG)-McGUIRE
STOPS / BRASS: (DA)-DAHL, (D)-DELTA, (McG)-McGUIRE
SUPPLIES / FAUCETS: (A) AMERICAN STANDARD, (CF)-CHICAGO FAUCETS, (D)-DELTA, (KO)-KOHLER, (SL)-SLOAN, (Z)-ZURN
U-1: (AS)-AMERICAN STANDARD, (C)-CRANE, (CO)-CONTRAC, (KO)-KOHLER

NOTE:
PLASTIC 'P' TRAPS WILL NOT BE ACCEPTED IN PLACE OF CHROME PLATED TRAPS (NO EXCEPTIONS)
ALL PLUMBING FIXTURES SHALL BE BY ONE MANUFACTURER.
ALL STOPS SHALL BE BY ONE MANUFACTURER.
ALL SUPPLIES SHALL BE BY ONE MANUFACTURER.

NOTES

GENERAL NOTES:
1. ALL DIMENSIONS ARE TO BE CONFIRMED ON SITE BEFORE STARTING WITH WORK.
2. ANY PENETRATIONS THROUGH FIRE RATED WALLS OR DECKS ARE TO BE FIRE STOPPED.
3. ALL WORK IS TO BE DONE IN ACCORDANCE WITH LOCAL, TERRITORIAL AND NATIONAL CODES AND STANDARDS.
4. PLUMBING SHALL BE DONE TO THE NATIONAL PLUMBING CODE AND LOCAL AND TERRITORIAL CODES & REQUIREMENTS.
5. ALL CUTTING, PATCHING & REFINISHING OF CEILINGS AND WALLS, BY GENERAL CONTRACTOR.

NO.	DATE	REVISIONS	BY	APPR.
2	JUL 07/22	ISSUED FOR TENDER	JL	JL
1	FEB 05/21	ISSUED FOR TENDER	JL	JL

CLIENT
CITY OF IQALUIT

ARCHITECTURAL/ENGINEERING TEAM

ENGLOBE

REGISTERED PROFESSIONAL ENGINEERS
DATE 2022-07-14
J. E. Leahey
11111
PROVINCE OF NOVA SCOTIA

PROJECT TITLE
CITY OF IQALUIT
ARNAITOK ARENA
RENOVATIONS
IQALUIT NUNAVUT

DRAWING TITLE
MECHANICAL PLUMBING PLANS - DEMOLITION AND NEW

Scale	Drawn By	Design By
1m 0 2m (1:100 FULL SCALE)	MW, JL	JL
	Checked By: JL	Cadd Check: MW
	Sheet 1 of 1	

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