July 30, 2025
Project Number: 25-077-01

RRC POLYTECH BUILDING M PIPE REPAIRS

RRC POLYTECH

ISSUED FOR CONSTRUCTION

SMS Engineering™

Delivering ingenious solutions and total peace of mind

SMS Engineering | 770 Bradford Street, Winnipeg, Manitoba, R3H 0N3

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Part 1 General

1.1 PROJECT

.1 Name of Project: RRC Polytech Building M Pipe Repairs

.2 Project Number: 25-077-01

.3 Location: Winnipeg, MB (Notre Dame Campus)

.4 Owner: RRC Polytech

1.2 BID CALL

.1 Bids will be received before 11:00:01 a.m. local time on August 13, 2025 (the "bid closing time") Winnipeg local time.

.2 Bids will be submitted electronically via MERX E-bid Submission.

.3 The Owner reserves the right to extend the bid closing time or cancel the bid call by addendum.

.4 Bids will be opened promptly after the bid closing time, at the specified bid closing location.

.5 Bids will not be opened publicly with Bidders present.

.6 Amendments to the submitted offer will be permitted if received in writing prior to bid closing and if endorsed by the same party or parties who signed and sealed the offer.

1.3 BID INTENT

.1 Intent of this bid call is to obtain an offer to perform Work to complete the Pipe Repairs located at RRC Polytech Building M Notre Dame Campus for Stipulated Price contract, in accordance with Contract Documents.

.2 Perform the Work within the time stated in Section 01 10 00 – Summary of Work.

1.4 CONTRACT DOCUMENTS IDENTIFICATION

.1 Contract Documents are identified as RRC Polytech Building M Pipe Repairs, SMS Project No. 25-077-01 as prepared by SMS Engineering Ltd., located at 770 Bradford Street in Winnipeg, Manitoba and listed in the Project Manual.

1.5 BID DOCUMENT AVAILABILITY

.1 Bid Documents are made available in electronic form only for the purpose of obtaining bids for this project. It does not confer a license to use the Bid Documents for any other purpose.

.2 Electronic copy Bid Documents may be accessed at: MERX

1.6 EXAMINATION OF BID DOCUMENTS

.1 Examine the Bid Documents and promptly notify the person designated to receive inquiries of any perceived errors, omissions, conflicts or discrepancies in the Bid Documents.

1.7 SITE EXAMINATION

.1 Bidders shall visit the site and familiarize themselves with conditions affecting the Work before submitting a bid.

.2 Bidders' only opportunity to visit the Place of the Work will be in conjunction with the specified pre-bid meeting and site visit.

.3 Bidders visiting the Place of the Work shall be accompanied at all times by a representative of the Owner.

.4 By inference of the "Concealed or Unknown Conditions" GC in the General Conditions of the Contract, Bidders shall include in their bid price for non-concealed and known conditions that are either visible or can be reasonably inferred from a site examination at the Place of the Work before bid submission.

1.8 PRE-BID MEETING AND SITE VISIT

.1 A mandatory pre-bid meeting and site visit at the Place of the Work has been scheduled for 2 p.m. local time on August 5th, 2025. Attendees shall meet at RRC Polytech – Notre Dame Campus Building M, meet at the southside of the building.

.2 All prime contract and major subcontract Bidders and suppliers are invited to attend but only one attendee from each company may be allowed to attend.

.3 Issues arising from the pre-bid meeting and site visit will be addressed as required in an addendum to the Bid Documents. No meeting minutes will be issued. Bidders may not rely upon any information given verbally or otherwise at the pre-bid meeting and site visit and that is not confirmed by addendum.

1.9 BID ENCLOSURES/REQUIREMENTS

.1 Submit the following Bid Form Supplements together with the Bid Form:

- .1 Bid bond as specified.
- .2 Consent of Surety
- .3 Undertaking of Insurance
- .4 Workers Compensation Clearances
- .5 Section 00 30 02 – Contractor Hourly Rates
- .6 Section 00 30 10 – List of Bid Documents
- .7 Section 00 43 36 – Proposed Subcontractors Form.

.2 The Owner may, after the bid closing time and before contract award, require any Bidder to submit additional supplementary information about any aspect of the Bidder's bid to verify compliance with the Bid Documents.

.3 To demonstrate qualification for performing the Work of this Contract, bidders may be requested to submit CCDC 11.

.4 Owner reserves the right to reject a proposed subcontractor for reasonable cause.

.5 Bid Bond

.1 Submit with the bid a CCDC 220 form of bid bond in an amount of not less than 10% of the bid price.

.2 The bid bond shall name the owner as the obligee and shall be signed, sealed, and dated by both Bidder and surety.

.3 Upon request, bid bonds of unsuccessful Bidders will be returned after the successful Bidder has entered into a contract with the Owner and provided the specified contract security, or earlier at the Owner's discretion.

.4 In lieu of a bid bond, Bidders may submit a certified cheque or bank draft in favour of the owner and in an amount of not less than 10% of the bid price.

.5 Certified cheques and bank drafts will be returned to Bidders after the successful Bidder has entered into a contract with the Owner and has provided the specified contract security, or earlier at the Owner's discretion.

.6 If a Bidder whose bid is accepted by the Owner in writing, without conditions, and within the acceptance period specified in the Bid Documents, refuses or fails within 15 calendar days after the date of issuance of the written acceptance of the bid, to sign a formal agreement with the Owner for the performance of the Work and to provide contract performance security as specified in the Bid Documents, the Bidder will be liable to the Owner for the difference in money between the Bidder's bid price and the amount for which the Owner legally contracts with another party to perform the Work, if the latter amount is in excess of the former, up to the maximum amount of the bid security provided.

.6 Consent of Surety

.1 Each bid shall be accompanied with a Consent of Surety to Bond in the form of a signed and sealed letter from Surety Company stating they will provide Performance Bond and Labour and Material Payment Bond if the bid is accepted.

.2 The Consent of Surety provided to the successful Bidder, if any, will be returned after delivery to the Owner of Performance and Labour and Material Payment bonds.

.3 Include the cost of the Performance Bond and Labour and Material Payment Bond in the Base Bid.

.4 Refer to Section 00 73 63 – Contract Security Requirements.

.7 Undertaking of Insurance

.1 Provide signed "Undertaking of Insurance" on standard form provided by insurance company stating intention to provide insurance to Bidder in accordance with insurance requirements of Contract Documents.

.8 Workers Compensation Clearances

.1 Provide with bid form clearance certificate from Workers Compensation Board of Manitoba indicating bidding Contractor and all sub-trades are in good standing.

.9 Section 00 30 02 – Contractor Hourly Rates

.1 Complete and submit Section 00 30 02 – Contractor Hourly Rates Form, submit as per the requirements of the section.

.10 List of Subcontractors

.1 Complete and submit Section 00 43 36 – Proposed Contractors Form, indicating those Subcontractors or Suppliers whose bids have been received by the Bidder, which names the Bidder would be prepared to accept for the performance of the work indicated.

.2 The purpose of this requirement is to protect the interests of subcontract bidders and the integrity of the bidding process. Provided the List of Subcontractors has been properly completed and submitted, the information will not be used in evaluating the Bids to determine the lowest compliant bidder.

1.10 QUALIFICATIONS

.1 Contractor to have minimum five years experience and to have successfully performed work of similar nature and approximate size to that indicated in specifications and on drawings. Sub-trades shall employ on this project, foremen or supervisory personnel who have had similar experience to that required of Contractor.

1.11 SUBSTITUTIONS

.1 Where the Bid Documents specify particular Products by proprietary name, the Consultant will consider Bidder requests for approval of substitutions during the bid period, provided such requests are received, in writing, before the bid closing time and are in accordance with the requirements specified in Section 01 25 00 – Substitution Procedures. If the Consultant approves a substitution, the substitute Product will be named in an addendum. Otherwise, Bidders shall consider the request for approval of the substitution to be rejected.

1.12 BID FORM SIGNING

.1 Complete the Bid Form as follows:

.1 Incorporated Company: Provide company name and name and signature of the duly authorized signing representative(s). Insert under each signature the representative's capacity to act on behalf of the company.

.2 Joint Venture: Each entity within the joint venture shall execute the Bid Form as specified.

.3 Partnership: Provide name of partnership and name and signature of duly authorized representatives of the partnership.

.4 Sole Proprietorship: Provide name of sole proprietorship and name and signature of sole proprietor in the presence of a witness who shall also sign.

.2 Print names and official capacity of all individuals signing the Bid Form below the signatures.

.3 Make all signatures in ink.

.4 If a Bid Submission is submitted jointly by two or more persons, the word “Bidder” shall mean each and all such persons, and the undertakings, covenants and obligations of such joint Bidders in the Tender Submission and the Contract, when awarded, shall be both joint and several.

1.13 BID SUBMISSION

.1 Bidders are solely responsible for delivery of their Bids in manner and time prescribed.

.2 Include in bid price all taxes and customs duties in effect at the time of the bid closing, except for Value Added Taxes as defined in the CCDC standard form of contract.

.3 State in the Bid Form the time required to attain Ready-for-Takeover. This will not be considered in bid evaluation but will become the Contract Time under the Contract.

.4 Only electronic bids via MERX will be accepted. Verbal, telephoned, fax, e-mail, or text message bids will not be accepted nor acknowledged.

.5 Electronic Bids:

.1 Bids must be submitted electronically via MERX E-Bid Submission.

.2 Please note that in order to submit a Bid via MERX E-Bid Submission, Bidders must have an appropriate MERX subscription and have permission from their authorized signer to complete the submission process.

.1 Information about MERX can be obtained on its website www.merx.com, by phone at 1-800-964-6379 or by email at merx@merx.com.

.2 In event of any technical issues with MERX E-Bid Submission, Bidders should contact a MERX agent by phone using the aforementioned phone number.

.3 Submit Bids in prescribed format.

.1 Prepare Bids in accordance with the following instructions:

.1 Submit Bids in Adobe Acrobat Document format (suffix *.pdf).

.1 Bids attempted to be submitted in any other format besides those listed above will not be accepted by MERX E-Bid Submission.

.2 File Naming:

.1 Label all uploaded files with the SMS Engineering Project Number (listed in section 1.1) and the Bidder's full legal name. Where multiple I/O numbers are listed please use the top most number as the identifier.

.2 Limit file names to a maximum of 50 characters.

.1 Spaces use up three (3) characters, and therefore should be avoided – use hyphens and underscores instead.

.3 File extensions will not count towards the total number of characters.

.4 Organize uploaded files into sections, clearly labelled in the file names as indicated below.

.3 Sample file naming:

.1 25-077-01 RRC Building M Pipe Repairs - Company-Name_Bid Submission.pdf

.4 Document Format:

.1 All text pages shall be formatted to letter (8 1/2" x 11") page size; and schedules may be formatted to tabloid (11" x 17") page size.

.2 There is an individual file size limit of 500 MB.

.5 Test documents.

.1 Test documents or test submissions are not required but are allowed if Bidders wish to submit test documents ahead of the Submission Deadline.

.2 Mark all uploaded files with 'TEST'.

.4 Submit Bids on time.

.1 Bids must be submitted in their entirety via MERX E-Bid Submission on or before the submission deadline.

.2 The time for submission for Bids shall be determined by the Merx E-Bid Submission web clock.

.3 Bidders should plan to submit Bids well in advance of the Submission Deadline to avoid submitting late due to technical issues. Bidders submitting Bids near the Submission Deadline do so at their own risk.

.4 MERX E-Bid Submission will not permit Bids to be submitted after the Submission Deadline. In event that MERX E-Bid Submission allows the submission of a Bid after the Submission Deadline, it will be rejected.

1.14 BID MODIFICATION AND WITHDRAWL

.1 A bid, including the Bid Form and Bid Form supplements, submitted in accordance with these bidding requirements may be modified or withdrawn, provided the modification or withdrawal request:

.1 Is made at any time prior to the Submission Deadline by following the MERX instructions for MERX E-Bid Submissions.

.2 Is received prior to the Submission Deadline.

.3 Faxed or emailed requests will not be accepted.

.2 If a bid is withdrawn, a new bid may be submitted in accordance with the specified requirements, provided it is received before the bid closing time.

.3 When submitting a modification directing a change in a bid price, do not reveal the original amount nor the revised amount:

.1 On stipulated price bids, state only the amount to be added to or deducted from the original bid price.

.4 When submitting a second or more modifications related to a particular bid price, ensure that there is no ambiguity as to the intended bid price. The written modification shall clearly indicate whether:

.1 the bid price first submitted is being modified and any previous modifications are to be disregarded, or

.2 a revised bid price derived from a previous modification is being modified.

.5 State all addendum numbers received, if different from what was indicated on originally submitted Bid Form.

.6 The Owner will assume no responsibility or liability for modifications or withdrawals that are, for any reason, delayed, illegible, unclear as to intent, ambiguous, contrary to these instructions, or otherwise improperly received. The Owner may disregard improperly received modifications or withdrawals

1.15 BIDDING IRREGULARITIES

.1 Bids with Bid Forms or required Bid Form Supplements that are improperly prepared, signed or submitted contrary to these Instructions to Bidders, or that contain added conditions or other irregularities of any kind, may, at the Owner's discretion, be rejected as non-compliant.

.2 The Owner may accept or waive a minor and inconsequential irregularity. The determination of what is, or is not, a minor and inconsequential irregularity, the determination of whether or not to accept or waive such an irregularity, and the final determination of whether the bid is compliant, will be at the Owner's sole discretion.

.3 The following irregularities relate to what are considered mandatory bidding requirements. These will not be considered minor and inconsequential and will cause the bid to be rejected as non-compliant:

.1 Bid or Bid Form Supplement is received after the specified bid closing time.

.2 Required Bid Form or Bid Form Supplement is missing.

.3 Bid Form or Bid Form Supplement is not in the form provided or required.

.4 Bid bond is improperly completed or executed, if such improper completion or execution may render the bid bond unenforceable.

.5 A bid price is illegible, ambiguous or unclear.

.6 One or more conditions are added to or submitted with the bid, the effect of which is a material modification of the Bid Documents.

.7 Failure to indicate in the Bid Form the addendum number(s) of all addenda received.

.8 Failure to comply with any other bidding requirement expressly characterized as mandatory elsewhere in the Bid Documents.

1.16 BID ACCEPTANCE PERIOD

.1 Bids shall remain open to acceptance by the Owner and shall be irrevocable until another Bidder enters into a contract with the Owner for performance of the Work or until expiry of the bid acceptance period stated in the Bid Form, whichever occurs first.

.2 After bid closing and before expiry of the bid acceptance period stated in the Bid Form, the Owner may request all Bidders to agree to an extension of the originally specified bid acceptance period. In such case the bid acceptance period will be extended subject to the Bidder, whose bid the Owner wishes to accept, having agreed in writing to the extension.

1.17 BID ACCEPTANCE

.1 The lowest or any bid will not necessarily be accepted and the Owner may reject any and all bids.

.2 The Contract will be established if and when the successful Bidder receives from the Owner a written notification accepting the bid without any conditions. If the Owner's

written notification accepting the bid contains, or is subject to, any conditions, the Contract will be established if and when the Bidder accepts all such conditions in writing or when the parties execute the agreement.

.3 If the lowest compliant bid exceeds the Owner's budget, and the Owner is unwilling or unable to award a contract at the bid price, the Owner may:

.1 negotiate, with the lowest compliant Bidder only, changes to the Bid Documents and a reduced bid price acceptable to the Owner, or

.2 invite the three lowest compliant Bidders (only) to re-bid on modified Bid Documents under a new bid call

1.18 INTERPRETATION AND MODIFICATION OF BID DOCUMENTS

.1 If an inquiry requires an interpretation or modification of the Bid Documents, the response to that inquiry will be issued in the form of a written Addendum only, to ensure that all Bidders base their bids on the same information.

.2 Replies to inquiries or interpretations or modifications of the Bid Documents made by e-mail, verbally, or in any manner other than a written Addendum, will not form part of the Bid Documents and will not be binding.

1.19 QUERIES/ADDENDA

.1 Addenda may be issued to modify the Bid Documents in response to Bidder inquiries or as may be considered necessary.

.2 Direct questions to the office of the Prime Consultant, SMS Engineering Ltd., located at 770 Bradford St., Winnipeg, MB, 204-775-0291, or by e-mail at jbull@smseng.com, attention: Jordan Bull, P.Eng.

.3 Addenda will become part of Contract Documents. Include costs in bid price.

.4 Verbal answers are only binding when confirmed by written addenda.

.5 Clarifications requested by Bidders must be in writing not less than 7 business days before date set for receipt of bids. Reply will be in form of an addendum. Copy of addendum will be posted on MERX no later than 5 working days before receipt of bids.

.6 Each Bidder shall ascertain before bid submission that it has received all addenda issued during the bid period and shall indicate in the Bid Form the addendum number(s) of all addenda received.

Part 2 Products

2.1 NOT USED

.1 Not Used.

Part 3 Execution

3.1 NOT USED

.1 Not Used.

.2

END OF SECTION

PROJECT: RRC Polytech Building M Pipe Repairs

SUBMITTED BY: _____

_____

1.1 SCHEDULE OF LABOUR RATES

.1 Submit a schedule of labour rates for all trades and classifications of trades, such as journeymen, apprentices, and foremen that will be employed in the Work. Provide a breakdown of payroll burden component of labour rates.

.2 Labour rates shall reflect the salaries, wages, and benefits paid to personnel in the direct employ of the Contractor, Subcontractors, and sub-Subcontractors, stated as hourly rates, that will be used when:

.1 preparing price quotations for Change Orders, and

.2 determining the cost of work attributable to Change Directives.

.3 Labour rates stated in the schedule of labour rates shall be consistent with rates that will actually be paid, and payroll burden costs that will actually be incurred, in the normal performance of the Work, during regular working hours. Labour rates shall not include any additional overhead and profit component.

.4 Where collective agreements apply, the labour rates shall not exceed those established by collective agreement.

.5 Schedule of labour rates will be used solely for evaluating Change Order quotations and cost of performing work attributable to Change Directives.

.6 The Contractor may request amendments to the accepted schedule of labour rates if changes in the labour rates that will actually be paid, or payroll burden cost that will actually be incurred, in the normal performance of the Work can be demonstrated. Obtain the Owner's written acceptance of such changes.

END OF SECTION

PROJECT: RRC Polytech PLP – HVAC Upgrades

SUBMITTED BY: _____

_____

The following is a list or description of the Bid Documents referred to in the Bid for the above named project.

Specifications as per the table of contents
Drawing Cover page
Mechanical drawings (12 Pages)
Electrical drawings (12 Pages)
Structural drawings (2 Pages)

END OF SECTION

DATE: _____ , 20___

SUBMITTED BY: _____

_____

_____

TO: (OWNER) _____

C/O SMS ENGINEERING

1.1 GENERAL

.1 Having examined the bidding documents as well as all modifications thereto,

PREPARED BY: SMS ENGINEERING LTD.
CONSULTING ENGINEERS

FOR THE: RRC Polytech Building M Pipe Repairs

_____

_____

and having visited the site, we hereby offer to complete the Work for the sum of:

_____

_____ Dollars ($)

in lawful money of Canada which excludes all taxes. Applicable taxes are listed below:

PST: _____

_____ Dollars ($)

GST: _____

_____ Dollars ($)

Total: _____

_____ Dollars ($)

In lieu of providing the expansion loops as indicated on the drawings, we provide this

separate price to use expansion compensators:

_____

_____ Dollars ($)

in lawful money of Canada which excludes all taxes. Applicable taxes are listed below:

PST: _____

_____ Dollars ($)

GST: _____

_____ Dollars ($)

Total: _____

_____ Dollars ($)

.2 In submitting this tender, we recognize the right of the Owner to accept any tender for the price submitted, or to reject all tenders.

.3 We, the undersigned, declare that:

.1 We are qualified to perform the work in accordance wit the bid documents and our bid price covers all of our obligations and things necessary for the performance of the work,

.2 We have arrived at this bid without collusion with any competitor,

.3 All bid form enclosures and supplements form an integral part of this bid, and

.4 We agree to honour our tender for a period of thirty (30) days from the closing date of this tender.

.4 We enclose herewith Bid Supplements identified as:

.1 Bid bond as specified.

.2 Consent of Surety

.3 Undertaking of Insurance

.4 Workers Compensation Clearances

.5 Section 00 30 02 – Contractor Hourly Rates

.6 Section 00 30 10 – List of Bid Documents

.7 Section 00 43 36 – Proposed Subcontractors Form.

.5 In submitting this bid it is understood that revised bids shall not be called if minor changes only are contemplated.

.6 IF NOTIFIED IN WRITING BY THE OWNER OF THE ACCEPTANCE OF THIS BID WITHIN 30 DAYS OF THE BID CLOSING DATE, WE WILL:

.1 Execute the Agreement.

.2 Furnish a general analysis of the contract sum, to the satisfaction of the Consultant, the total aggregating the amount of the Tender.

.3 Provide a Performance Bond on the latest issue of CCDC 221 endorsed form.

.4 Attain read-for-takeover within _____ weeks after instruction to commence work.

.5 Provide a construction progress schedule as specified.

.6 Comply with specified insurance requirements.

.7 Provide necessary price breakdown as specified.

.7 CONTRACT DOCUMENTS

.1 I/We hereby acknowledge receipt of all pages of the documents as identified in the Project Manual Contents and List of Drawings.

.8 ADDENDA

.1 I/We hereby acknowledge receipt of the following addenda covering modifications to the Contract Documents.

Addendum No.	Total Pages	Dated
_____	_____	_____
_____	_____	_____
_____	_____	_____

.9 AFFIX SEAL

.10 NAME OF BIDDER

_____

_____

SIGNED BY _____

TITLE _____

DATE _____

END OF SECTION

Part 1 General

1.1 BID FORM SUPPLEMENT

.1 A completed bid bond form is required to be attached to the Bid Form.

1.2 BID BOND FORM

.1 The CCDC 220 form of bid bond is the required form for a bid bond.

.2 A bid bond or other bid security as described in the Instructions to Bidders, is required to be attached to the Bid Form as a supplement.

.3 Information on obtaining the CCDC 220 form may be found on the Canadian Construction Documents Committee website; https://www.ccdc.org/document/ccdc220/ .

END OF SECTION

PROJECT: RRC Polytech Building M Pipe Repairs

SUBMITTED BY: _____

I/We SUBMIT HEREWITH, a list of Subcontractors and Sub-subcontractors we propose to use reserving however, the right to substitute other Subcontractors or Sub-subcontractors in the event of any Subcontractor or Sub-subcontractor withdrawing his bid or becoming bankrupt after the date hereto. Any such substitution is subject to the approval of the Owner and contingent upon evidence of withdrawal or bankruptcy.

SUBCONTRACTS	**NAME OF SUBCONTRACTOR**	**VALUE ($)**
MECHANICAL		
INSULATION		
FIRE PROTECTION		
LIQUID HEAT TRANSFER		

END OF SECTION

Part 1 General

1.1 FORM OF CONTRACT

.1 The form of Contract, including the Agreement, Definitions, and General Conditions is CCDC 2 – 2020, Stipulated Price Contract, subject to the modifications specified in Section 00 73 00 – Supplementary Conditions.

1.2 CONTRACT COPYRIGHT AND AVAILABILITY

.1 The CCDC form of Contract is a copyrighted document published by the Canadian Construction Documents Committee. It is incorporated into these Bid Documents by reference. It is available for purchase from any CCDC document outlet. Refer to ccdc.org.

1.3 CONTRACT PREPARATION FOR SIGNING

.1 The Owner will prepare two copies of the form of Contract for signing by the Contractor and the Owner after notice of award. Each copy will be comprised of the CCDC form of Contract with a CCDC copyright seal affixed, with a completed Agreement form, and with other Contract Documents referenced or appended.

END OF SECTION

1.1 CONTRACT

.1 The construction document for this project shall be the Canadian Standard Construction Document CCDC 2-2020, Stipulated Price Contract, the General Conditions of which as herein modified shall become a part of the contract.

.2 The amendments and/or clarifications described below shall govern over the CCDC 2-2020 contract document.

1.2 MODIFICATIONS

.1 The Agreement between Owner and Contractor shall be modified and amended as follows:

Article A-3-CONTRACT DOCUMENTS: Complete paragraph 3.1 to read as follows:

"3.1 The following are the Contract Documents referred to in Article A-1 of the Agreement - THE WORK:
Agreement Between Owner and Contractor
Definitions
The General Conditions of the Stipulated Price Contract
Supplementary Conditions
Divisions 1 through 28, as indexed, of the Specifications
Drawings numbered
Addendum _____
Addendum _____
Other _____

.2 The General Conditions of Document C.C.D.C. 2 shall be modified and amended as follows:

GC 2.2 ROLE OF THE CONSULTANT

Delete the following words from Paragraph 2.2.6,
"Except with respect to GC 5.1 - FINANCING INFORMATION REQUIRED OF THE OWNER"

GC 2.3 REVIEW AND INSPECTION OF THE WORK

Amend Paragraph 2.3.2 to add the following words, to the end of the last sentence thereof,
"and the Contractor shall promptly notify the Consultant of any instructions issued by the inspectors employed by such other authorities."

Add a new Paragraph 2.3.8 which shall read as follows:

"2.3.8 Observation of the Work by the Consultant shall be periodic for the purposes of determining the general progress and the general quality of the Work, and not for the purposes of supervising the Contractor or overseeing installations by the Contractor."

Add a new Paragraph 2.3.9 which shall read as follows:

"2.3.9 The Contractor is not relieved of its responsibility for defective Work if such defective Work is not observed or detected by the Consultant or if no complaint is made or registered by the Consultant."

Add a new Paragraph 2.3.10 which shall read as follows:

"2.3.10 Instructions at the Place of the Work will be given only by the Consultant. The Contractor shall not take any direct instruction from the Owner or any representatives of the Owner other than the Consultant."

GC 2.4 DEFECTIVE WORK

Add new paragraph:

2.4.4 Where work is defective, including work previously certified for payment, the Consultant shall establish an amount to be deducted from the Application for Payment to cover the replacement cost of the defective work.

Add new paragraph:

2.4.5 The contractor is not relieved of responsibility for defective work, if such defective work is not observed by the Consultant, or if no complaint is made or registered by the Consultant.

GC 3.2 CONSTRUCTION BY OWNER OR OTHER CONTRACTORS

3.2.2.1 Delete this clause entirely.

GC 5.1 FINANCING INFORMATION REQUIRED OF THE OWNER

Delete this clause entirely.

GC 5.2 APPLICATIONS FOR PROGRESS PAYMENT

Add the following paragraphs:

5.2.9 The application for release of holdback monies must be accompanied by a letter from the Workers Compensation Board stating that the contractor is in good standing with the Board.

5.2.10 Measurement of any fixed price item, for determination of progress payments, shall be made by the Consultant in the presence of the Contractor.

GC 5.3 PROGRESS PAYMENT

5.3.1.1 Change "10 calendar days" to read "10 working days".

5.3.2 Add a new Paragraph 5.3.2. which shall read as follows:

"Notwithstanding the provisions of Paragraph 5.3.1, the progress payment which falls due

at or immediately following the date of Substantial Performance of the Work shall not be paid by the Owner to the Contractor unless and until the Contractor has furnished the Consultant with a letter from the Workers Compensation Board of Manitoba stating that the Contractor is in good standing with that Board and that final settlement for Work performed on the Project is in order."

GC 5.4 SUBSTANTIAL PERFORMANCE OF THE WORK AND PAYMENT OF HOLDBACK

5.5.4 Amend Paragraph 5.4.3 to add the following words to the end of the first sentence thereof:

", save and except that payment under this provision shall not be made to the Contractor unless and until the letter from the Workers Compensation Board of Manitoba mentioned in Paragraph 5.3.2 has been submitted to the Consultant."

GC 5.5 FINAL PAYMENT

5.5.4 Change "5 calendar days" to read "10 working days".

Amend Paragraph 5.5.4 to add the following words to the end thereof: ", save and except that payment under this provision shall not be made to the Contractor unless and until the letter from the Workers Compensation Board of Manitoba mentioned in Paragraph 5.5.2 has been submitted to the Consultant."

GC 6.2 CHANGE ORDER

.1 Paragraph 6.2.1: delete in its entirety and replace with the following:

"6.2.1 When a change in the Work is proposed or required, the Consultant shall provide a notice describing the proposed change in the Work to the Contractor. The Contractor shall, within the time limits set forth below, present by way of written proposal, in a form acceptable to the Consultant, a method of adjustment or an amount of adjustment for the Contract Price, if any, and the adjustment in the Contract Time, if any, for the proposed change in the Work. The following guidelines shall apply to the preparation and presentation of such written proposal:

a) the Contractor shall provide copies of detailed (itemized) credit/estimate cost quotations from the Contractor and affected Subcontractors. Said quotation from the Contractor and Subcontractors shall include the following:
   i) Cost of materials, handling, and freight/transportation costs required for the change at list prices less trade discount.
   ii) Cost of labour and supervision required for the change, including all statutory and labour agreement charges.
   iii) Cost for the use of rented or owned equipment required for the change at standard rental rates plus transportation costs.
   iv) Effect of the change on the Contract Time, if any.
   v) Cost for the change in fees to permits and utility coordination, if any.
b) Costs for increases in the Work, unless otherwise agreed, shall be marked up as follows for overhead and profit.
   i) Mark-up will apply only to sub-totals.

ii) Mark-ups are defined as costs associated with office costs (including site offices), estimating, IT costs, clean-up, as-built/record drawings, safety, additional supervision costs (i.e. project managers, superintendents), and costs associated with additional bonding and insurance
iii) Contractor - 10% overhead and 5% profit on the cost of Contractor's own Work, and 5% overhead and 5% profit on Subcontractor's prices.
iv) Subcontractors - 10% overhead and 5% profit on the cost of their own Work, 5% overhead and 5% profit on Sub-Subcontractor's price.
v) Sub-subcontractors – no additional mark-up permitted.

c) Costs for decreases in the Work may not be marked up.
d) Estimating, change order pricing or processing time will not be considered a recoverable cost.
e) If requested by the Consultant, the Contractor shall submit details of quantities, prices and fees, as outlined above, together with substantiation documentation.
f) The Contractor will cooperate in the pricing of the change and submit his written proposal within 10 days of the Consultant's request, and the proposal shall remain open for acceptance for 10 days from the date of submission. The Contractor shall have the option to accept changes in the Work under separate contract where such changes would unreasonably delay the date of Substantial Performance of the Work.
g) If the Contractor's written proposal does not include a statement regarding the completion date it shall be formally considered as confirmation that the completion date is not affected."

GC 6.3 CHANGE DIRECTIVE

6.3.2 Add the following:

"using the same percentage markups on costs as allowed in paragraph 6.2.1 of these General Conditions. The Owner may request an upset limit cost estimate to be provided within 48 hours of the request."

GC 7.2 CONTRACTORS RIGHT TO SUSPEND THE WORK OR TERMINATE THE CONTRACT

7.2.3.1 Delete this sentence.

7.2.3.4 Delete "except for GC5.1 Financing Information Required of the Owner.

GC 8.3 NEGOTIATION, MEDIATION AND ARBITRATION

Amend Paragraph 8.3.2 to delete the reference to "15 Working Days" found in the third line thereof and to replace such reference with a reference to "5 Working Days".

Amend Paragraph 8.3.2 to delete the reference to "10 Working Days" found in the 5th line thereof and to replace such reference with a reference to "5 Working Days".

Add new paragraph 8.3.9 which shall read as follows:

"8.3.9 Within five days of receipt of the notice of arbitration by the responding party

under paragraph 8.3.6, the Owner and the Contractor shall give the Consultant a written notice containing:

a) a copy of the notice of arbitration;
b) a copy of supplementary conditions 8.3.9 to 8.3.15 of this Contract, and;
c) any claims or issues which the Contractor or the Owner, as the case may be, wishes to raise in relation to the Consultant arising out of the issues in dispute in the arbitration."

Add new paragraph 8.3.10 which shall read as follows:

"8.3.10 The Owner and the Contractor agree that the Consultant may elect, within ten days of receipt of the notice under paragraph 8.3.9, to become a full party to the arbitration under paragraph 8.3.6 if the Consultant:

a) has a vested or contingent financial interest in the outcome of the arbitration;
b) gives the notice of election to the Owner and the Contractor before the arbitrator is appointed;
c) agrees to be a party to the arbitration within the meaning of the rules referred to in paragraph 8.3.6, and;
d) agrees to be bound by the arbitral award made in the arbitration."

Add new paragraph 8.3.11 which shall read as follows:

"8.3.11 If the Consultant is not given the written notice required under paragraph 8.3.9, both the Owner and the Contractor are estopped from pursuing an action, counter claim or other proceeding or making an application against the Consultant arising out of the issues in dispute in the arbitration between the Owner and the Contractor under paragraph 8.3.6."

Add new paragraph 8.3.12 which shall read as follows:

"8.3.12 If an election is made under paragraph 8.3.10, the Consultant may participate in the appointment of the arbitrator and, notwithstanding the rules referred to in paragraph 8.3.6, the time period for reaching agreement on the appointment of the arbitrator shall begin to run from the date the Owner receives a copy of the notice of arbitration."

Add new paragraph 8.3.13 which shall read as follows:

"8.3.13 The arbitrator in the arbitration in which the Consultant has elected under paragraph 8.3.10 to become a full party may:

a) on application of the Owner or the Contractor, determine whether the Consultant has satisfied the requirements of paragraph 8.3.10, and;
b) make any procedural order considered necessary to facilitate the addition of the Consultant as a party to the arbitration."

Add new paragraph 8.3.14 which shall read as follows:

"8.3.14 The provisions of paragraph 8.3.9 shall apply mutatis mutandis to written notice to be given by the Consultant to any sub-consultant."

Add new paragraph 8.3.15 which shall read as follows:

"8.3.15 In the event of notice of arbitration given by a consultant to a sub-consultant, the sub-consultant is not entitled to any election with respect to the proceeding as outlined in 8.3.10, and is deemed to be bound by the arbitration proceeding."

GC 11.1 INSURANCE

Add new paragraphs which shall read as follows:

11.1.9 Provide a minimum of 10 (ten) million dollars of insurance coverage for Wrap-Up liability insurance

GC 12.3 WARRANTY

Paragraph 12.3.1 is supplemented as follows:

"Where equipment, machinery, products require Owner operation for full trial/testing, start-up procedures, the warranty on the equipment, machinery, products shall not commence until they have been tested under operation and found to be, or put into, good order."

Add new paragraph:

12.3.7 In an emergency or potential life-threatening situation, Owner will attempt to contact Contractor, describe the circumstances to him, and take necessary action until Contractor has rectified situation. If the Owner is unable to reach the Contractor or if Contractor's response is untimely, Owner will take necessary steps to bring situation under control. Contractor shall reimburse Owner for all costs incurred, provided that any warranty period defect is attributable to workmanship, materials, and/or equipment provided by Contractor. Under above circumstances, repair work performed by qualified personnel under Owner's direction shall not void terms of warranty in any way.

END OF SECTION

Part 1 General

1.1 PERFORMANCE BOND

.1 Provide security for performance of the Contract in the form of a Performance Bond for 50% of the Contract Price.

.2 Bond shall be in accordance with the latest edition of the Canadian Construction Documents Committee (CCDC) Standard Form of Performance Bond, CCDC 221.

.3 Bond shall be issued by a duly licensed surety company authorized to transact the business of suretyship in the province or territory of the Place of the Work.

.4 Bond shall name the Owner as the obligee and shall be signed, sealed, and dated by both Contractor and surety company.

.5 Submit bond to Owner within seven (7) days after contract award.

1.2 LABOUR AND MATERIAL PAYMENT BOND

.1 Provide security for payment of labour and material provided in the performance of the Work in the form of a Labour and Material Payment Bond for 50% of the Contract Price.

.2 Bond shall be in accordance with the latest edition of the Canadian Construction Documents Committee (CCDC) Standard Form of Labour and Material Payment Bond, CCDC 222.

.3 Bond shall be issued by a duly licensed surety company authorized to transact the business of suretyship in the province or territory of the Place of the Work.

.4 Bond shall name the Owner as the obligee and shall be signed, sealed, and dated by both Contractor and surety company.

.5 Submit bond to the Owner within seven (7) days after contract award.

END OF SECTION

Part 1 General

1.1 WORK OF THE PROJECT

.1 Work of the Project, of which Work of this Contract is a part, comprises the following:

- .1 Drain down of the existing hydronic system.
- .2 Pipe repairs to the hydronic system.
- .3 Refill of the hydronic system.
- .4 Associated work.

.2 Co-operate with other Contractors in carrying out their respective works and carry out instructions from Consultant.

1.2 DIVISION OF WORK

.1 Division of the Work among Subcontractors and Suppliers is solely Contractor's responsibility. Consultant and Owner assume no responsibility to act as an arbiter to establish subcontract limits between Sections or Divisions of the Work.

1.3 SPECIFICATIONS LANGUAGE AND STYLE

.1 These specifications are written in the imperative mood and in streamlined form. The imperative language is directed to Contractor, unless stated otherwise.

.2 Complete sentences by reading "shall", " Contractor shall", "shall be", and similar phrases by inference. Where a colon (:) is used within sentences and phrases, read the words "shall be" by inference.

.3 Fulfill and perform all indicated requirements whether stated imperatively or otherwise.

.4 When used in the context of a Product, read the word “provide” to mean “supply and install to result in a complete installation ready for its intended use”.

1.4 CONTRACT DOCUMENTS FOR CONSTRUCTION PURPOSES

.1 Owner will supply Contractor with a complete set of Contract Documents in electronic form before commencement of the Work. Contractor may print hard copies for construction purposes as required.

1.5 WORK SEQUENCE

.1 Coordinate Progress Schedule and coordinate with Owner's Occupancy during construction.

.2 Construct Work in stages to provide for continuous public usage. Do not close off public usage of facilities until use of one stage of Work will provide alternate usage.

1.6 ALTERATIONS, ADDITIONS OR REPAIRS TO EXISTING BUILDING

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

1.7 EXISTING CONDITIONS

.1 Refer to Section 01 71 00 – Examination and Preparation.

.2 Examine site, existing adjacent buildings and local conditions affecting work under this contract. Examine Mechanical and all other Contract drawings to ensure work can be performed without changes to the building as shown on plans. No allowance will be made later for necessary changes, unless notification of interferences have been brought to Consultant's attention, in writing, prior to closing of tenders.

1.8 EXISTING SERVICES

.1 Notify Consultant and utility companies of intended interruption of services and obtain required permission.

.2 Where Work involves breaking into or connecting to existing services, give Owner and Consultant 48 hours notice for necessary interruption of mechanical or electrical service throughout course of work. Minimize duration of interruptions. Carry out work at times as directed by governing authorities with minimum disturbance to building operations and personnel.

.3 Provide alternative routes for personnel, pedestrian, and vehicular traffic.

.4 Location, routing and depth of existing services shown on drawings are based on recorded information and are approximate only. Establish exact location and extent of service lines in area of work before starting Work. Notify Owner and Consultant of findings.

.1 Prior to installation of piping or new services, advise Consultant of any discrepancy found during above procedure. Revised drawings or instructions will be given to Contractor. Extra payment will be made for revisions to each service requiring more than two test holes; more than 3m (10ft.) of extra pipe length and more than 300mm (12") of additional excavation.

.5 Avoid damaging or displacing existing services where exact position is not known. Should any damage occur, advise Consultant in writing for remedial instructions.

.6 Submit schedule to and obtain approval from Owner for any shut-down or closure of active service or facility including power and communications services. Adhere to approved schedule and provide notice to affected parties.

.7 Provide temporary services to maintain critical building and tenant systems.

.8 Provide adequate bridging over trenches which cross sidewalks or roads to permit normal traffic.

.9 Where unknown services are encountered, immediately advise Consultant and confirm findings in writing.

.10 Protect, relocate or maintain existing active services. When inactive services are encountered, cap off in manner approved by authorities having jurisdiction.

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

.12 Construct barriers in accordance with Section 01 56 00 – Temporary Barriers and Enclosures.

1.9 DOCUMENTS AT THE SITE

.1 Keep the following documents at Place of the Work, stored securely and in good order and available to Owner and Consultant in hard copy and electronic form:

.1 Current Contract Documents, including Drawings, Specifications and addenda.
.2 Change Orders, Change Directives, and Supplementary Instructions.
.3 Reviewed Shop Drawings, Product data and samples.
.4 Field test reports and records.
.5 Construction progress schedule
.6 Meeting minutes.
.7 Manufacturer's certifications.
.8 Permits, inspection certificates, and other documents required by authorities having jurisdiction.
.9 Current as-built drawings.
.10 Material Safety Data Sheets (MSDS) for all controlled Products.

1.10 CONTRACTOR'S USE OF PREMISES

.1 Except as otherwise specified, Contractor has unrestricted use of Place of the Work from time of Contract award until Ready-for-Takeover.

.2 Limit use of premises for Work, for storage, and for access, to allow:

.1 Owner occupancy.
.2 Work by other contractors.
.3 Public usage.

.3 Coordinate use of premises with Owner.

.4 Obtain and pay for use of additional storage or work areas needed for operations under this Contract.

.5 Remove or alter existing work to prevent injury or damage to portions of existing work which remain.

.6 Repair or replace portions of existing work which have been altered during construction operations to match existing or adjoining work as directed by Consultant.

.7 At completion of operations conditions of existing work to be of equivalent or better condition than existed before the Work started.

.8 Confine Construction Equipment, Temporary Work, storage of Products, waste products and debris, and all other construction operations to limits required by laws, ordinances,

permits, and Contract Documents, whichever is most restrictive. Do not unreasonably encumber Place of the Work.

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

.10 Owner will assign sanitary facilities for use by Contractor's personnel. Keep facilities clean to satisfaction of the Owner.

.11 Protect work temporarily until permanent enclosures are completed. Construct barriers in accordance with Section 01 56 00 – Temporary Barriers and Enclosures.

END OF SECTION

Part 1 General

1.1 ACCESS AND EGRESS

.1 Design, construct and maintain temporary "access to" and "egress from" work areas, including stairs, runways, ramps or ladders and scaffolding, independent of finished surfaces and in accordance with relevant municipal, provincial and other regulations.

1.2 OWNER OCCUPANCY

.1 Owner will occupy premises during entire construction period for execution of normal operations.

.2 Co-operate with Owner in scheduling operations to minimize conflict and to facilitate Owner usage. Refer to Section 01 32 13 – Scheduling of the Work.

1.3 RESTRICTED HOURS OF WORK IN OCCUPIED FACILITIES

.1 Work shall generally be completed during normal business hours which are Monday to Friday from 8:00 am to 05:00 pm. Work outside of these hours will require Owner approval.

.2 Generally, the Owner intends to relocate the occupants of the building to different areas of the building to allow the contractor to work during normal business hours.

.3 Allow for hours of work restrictions in construction progress schedule.

1.4 NOISY WORK RESTRICTIONS IN OCCUPIED FACILITIES

.1 Schedule excessively noisy work to avoid disturbance to building occupants. Perform excessive noise generating work outside of Owner’s normal business hours.

.2 Use powder actuated devices only with Consultant’s written permission.

1.5 MAINTAINING LIFE SAFETY SYSTEMS IN OCCUPIED FACILITIES

.1 Maintain operational life safety systems and public access to exits in occupied areas during all stages of the Work.

.2 Determine nature and exact locations of existing fire and smoke sensors prior to the commencement of the Work. Avoid direct or indirect jarring while working in adjacent areas and exercise caution to avoid triggering these devices.

.3 Be responsible for costs incurred by Owner on account of false fire alarms activated as a result of the execution of the Work without adequate precautions.

1.6 MAINTAINING BUILDING SERVICES IN OCCUPIED FACILITIES

.1 All building services will remain active during performance of the Work. Maintain services using temporary means or utilize live connection methods when connecting to existing services.

1.7 SITE ACCESS AND RELATED RESTRICTIONS

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

.2 Keep within limits of work and avenues of ingress and egress.

.3 Alcohol, legal recreational drugs such as marijuana and tobacco, non-prescription drugs, non-lifesaving prescription drugs not required during access on site, vaping products, smoking products, and other similar products and related substances are prohibited on the site. Prescription non-lifesaving medical products may be stored in LOCKED vehicles with a prescription. Lifesaving medical products such as Epipens or similar may be maintained on person but must be carried with a valid prescription matching the person carrying the product at all times.

.4 Identification badges and/or tags will be issued by the Owner and must be worn and visible from the front of the body at all times. Refer to Section 01 35 53 - Security Procedures.

.5 Security cards or FOB's will be issued for each employee of the Contractor. Refer to Section 01 35 53 - Security Procedures.

.6 Parking Restrictions:

.1 The Owner will allow for one vehicle to be parked in their parking lot on site. All other parking should follow local parking regulations.

1.8 BUILDING SMOKING ENVIRONMENT

.1 Comply with smoking restrictions. Smoking is allowed only in areas indicated.

Part 2 Products

2.1 NOT USED

.1 Not Used.

Part 3 Execution

3.1 NOT USED

.1 Not Used.

END OF SECTION

Part 1 General

1.1 SECTION INCLUDES

.1 Procedural requirements for proposed substitutions.

1.2 RELATED REQUIREMENTS

.1 Section 002113 – Instructions to Bidders

.2 Section 004325 - Substitution Request Form - During Procurement

.1 Required form for substitution requests prior to bid submission acceptance.

.3 Section 006325 - Substitution Request Form - During Construction

.1 Required form for substitution request after award of contract.

1.3 DEFINITIONS

.1 Substitution: means a Product, a manufacturer, or both, not originally specified in Contract Documents by proprietary name but proposed for use by Contractor in place of a Product, a manufacturer, or both, specified by proprietary name.

.1 Substitution for Cause: Proposed due to changed Project circumstances beyond the Contractor's control.

.1 Unavailability.

.2 Regulatory changes.

.2 Substitutions for Convenience: Proposed due to the possibility of offering substantial advantage to the Project.

1.4 SUBSTITUTION PROCEDURES

.1 Contractor may propose a Substitution wherever a Product or manufacturer is specified by proprietary name(s), unless there is accompanying language indicating that Substitutions will not be considered.

.2 Contractor may propose a Substitution wherever a Product or manufacturer is specified by proprietary name(s) and accompanied by language such as "or equal", "or approved equal", or other similar words. Do not construe such language as an invitation to unilaterally provide a Substitution without Consultant’s prior acceptance in writing. Do not order or install any Substitution without a Supplemental Instruction or Change Order.

.3 Provided a proposed Substitution submission includes all of the information specified in this Section under Submission Requirements For Proposed Substitutions, Consultant will promptly review and accept or reject the proposed Substitution.

.4 Consultant may accept a Substitution if satisfied that:

.1 the proposed substitute Product is the same type as, is capable of performing the same functions as, interfaces with adjacent work the same as, and meets or exceeds the standard of quality, performance and, if applicable, appearance and maintenance considerations, of the specified Product,

.2 the proposed substitute manufacturer has capabilities comparable to the specified manufacturer, and

.3 the Substitution provides a benefit to Owner.

.5 If Contractor fails to order a specified Product or order a Product by a specified manufacturer in adequate time to meet Contractor's construction schedule, Consultant will not consider that a valid reason to accept a Substitution.

.6 If Consultant accepts a Substitution and subject to Owner's agreement, the change in the Work will be documented through a Change Order as specified in CCDC 2 2020 and Section 00 73 00 – Supplementary Conditions.

.1 If a Substitution is accepted in the form of a Change Order, Contractor shall not revert to an originally specified Product or manufacturer without Consultant's prior written acceptance.

1.5 SUBMISSION REQUIREMENTS FOR PROPOSED SUBSTITUTIONS

.1 Submit with request all necessary samples, substantiating data, and manufacturer literature to prove equivalent function, appearance, quality, and performance to the specified product. Clearly mark manufacturer's literature showing such and provide comparison highlighting all differences.

.2 Include with each proposed Substitution the following information:

.1 Project name (including building number).

.2 Project number.

.3 Submission date.

.4 Name of Contractor.

.5 Name of Consultant.

.6 Identify the product or the fabrication or installation method to be replaced in each request, including product name and manufacturer's name, address, telephone numbers, and web site.

.7 Reason(s) for proposing the Substitution.

.8 Submit shop drawings as outlined in related product specification.

.9 Submit any other information requested in the related specification section.

.10 Include related specification section and drawing numbers.

.11 A summarized comparison (comply/non-comply list) of the physical properties and performance characteristics of the specified Product and the Substitution, with any significant variations clearly highlighted. Include a photocopy of all applicable specification sections, drawings, or product schedules showing a complete compliance / non-compliance listing. Refer to spec detail sheet "Shop Drawing Compliance List Sample", for example, (this detail sheet applies to Requests for Substitution as well).

.12 Manufacturer's Product literature for the Substitution (technical data, full detail, weight, size, performance, power requirements), including material descriptions, compliance with applicable codes and reference standards, performance and test data, compatibility with contiguous materials and systems, and environmental considerations of the proposed equipment and all components.

.13 Installation procedures.

.14 Product samples, where applicable or requested.

.15 Provide equipment wiring diagram showing power connection points, required amperages and voltages, etc. with any requests.

.16 A statement verifying that the Substitution will not affect the performance or warranty of other parts of the Work, or coordination information, including a list of changes or modifications needed to other parts of the work and to construction performed by the owner and/or contractors that will be necessary to accommodate the proposed equal.

.17 A statement verifying that the Substitution will not affect the Contract Price and Contract Time or, if applicable, the amount and extent of a proposed increase or decrease in Contract Price and Contract Time on account of the Substitution.

.18 Availability of maintenance services and sources of replacement materials and parts for the Substitution, as applicable, including associated costs and time frames.

.19 If applicable, estimated life cycle cost savings resulting from the Substitution.

.20 Details of other projects and applications where the Substitution has been used.

.21 Identification of any consequential changes in the Work to accommodate the Substitution and any consequential effects on the performance of the Work as a whole. A later claim for an increase to the Contract Price or Contract Time for other changes in the Work attributable to the Substitution will not be considered.

Part 2 Products

2.1 NOT USED

Part 3 Execution

3.1 SUBSTITUTION PROCEDURES DURING PROCUREMENT

.1 Applications for approval of substitution, or alternate materials, or methods, as substitutions for those specified or shown, shall be submitted to the Consultant not later than ten (10) working days before tenders are due.

.2 Request received later than ten (10) working days before tenders are due will not be considered.

.3 Request shall be in writing, electronic files in Adobe Acrobat PDF format.

.4 Include documentation required by Section 00 21 13 in addition to that required by this section and other sections referenced herein.

.5 Submittal Form (prior to award of contract):

.1 Submit substitutions requests by completing and submission of the form in Section 00 43 25 - Substitution Request Form (During Procurement); include additional information required by Section 00 43 25 in addition to that required by this section.

.2 Requests to be submitted to the following email address: jbull@smseng.com

.6 Consultant will review each request, determine action required, and respond. Allow five (5) working days for Consultant’s response for each request. Requests received by Consultant after 1:00 p.m. will be considered as received the following working day.

.7 Consultant's action may include a request for additional information, in which case Consultant's time for response will date from time of receipt of additional information.

.8 If approval is to be granted, the Consultant will reply prior to the closing of tenders by issuing an addendum.

.9 Tender closing date may be extended if in opinion of the Consultant additional time is required for competitive contractors to review and include in their bids.

.10 If an approval has been granted for the Substitution, the choice between the materials or methods specified and those approved as equal shall be optional.

.11 If an "Alternate" has been approved, the difference in cost between this alternate and the specified material or method shall be stated in the tender as an "add to" or "delete from" the tender price and the choice of materials or methods shall rest with the Consultant.

.12 Costs for any required additional material, wiring and labour due to the granted equal or approved alternate shall be included in the tender price or alternate price. This shall include costs which are incurred by other Divisions of this specification.

3.2 SUBSTITUTION PROCEDURES DURING CONSTRUCTION

.1 Submittal Form (after award of contract):

.1 Submit substitutions requests by completing and submission of the form in Section 00 63 25 - Substitution Request Form (During Construction); include additional information required by Section 00 63 25 in addition to that required by this section.

.2 Submit request for Substitution for Convenience immediately upon discovery of its potential advantage to the project, but not later than 14 days prior to time required for review and approval by Consultant and Owner, in order to stay on approved project schedule.

.1 In addition to meeting general documentation requirements, document how the requested substitution benefits the Owner through cost savings, time savings, greater energy conservation, or in other ways.

.2 Document means of coordinating of substitution item with other portions of the Work including work by affected subcontractors.

.3 Bear the costs engendered by proposed substitution of:

.1 Owner's means of coordinating of substitution item with other portions of the Work, including work by affected subcontractors.

.2 Bear the costs engendered by proposed substitution of:

.1 Owner's compensation to the Consultant for any required redesign and time spent processing and evaluating the Work.

.3 Substitutions will not be considered under one or more of the following circumstances:

.1 When they are indicated or implied on shop drawings or product data submittals, without having received prior approval.

.2 Without a separate written request.

.3 When acceptance will require revisions to Contract Documents.

3.3 ACCEPTANCE

.1 Owner through the Consultant will notify Contractor in writing of acceptance or rejection of proposed substitution. In some cases the Owner may request further information be provided prior to rendering a decision; in such cases provide required information as directed in an expedient manner.

.2 Accepted substitutions change the Work of the Project. They will be documented and incorporated into Work of the Project by Addendum or Change Order.

END OF SECTION

Part 1 General

1.1 RELATED REQUIREMENTS

.1 CCDC 2 2020 – Stipulated Price Contract

.2 Section 003002 – Contractor Hourly Rates

.3 Section 007300 – Supplementary Conditions

.4 Section 012900 – Payment Procedures

1.2 CONTRACT PRICE ADJUSTMENT - CHANGE ORDERS AND CHANGE DIRECTIVES

.1 Refer to CCDC 2-2020 and Section 00 73 00 – Supplementary Conditions for methods, procedures, and fees for change orders and change directives.

.2 Use labour rate schedule as outlined in section 00 30 02 when:

.1 preparing price quotations for Change Orders, and

.2 determining the cost of work attributable to Change Directives.

1.3 SUPPLEMENTAL INSTRUCTIONS

.1 The Consultant may issue Supplemental Instructions to provide clarifications to the Contract Documents, provide additional information, or make minor variations in the Work not involving adjustment in the Contract Price or Contract Time.

.2 If the Contractor considers a Supplemental Instruction to require an adjustment in Contract Price or Contract Time, the Contractor shall promptly notify the Consultant and the Owner in writing and shall not proceed with any work related to the Supplemental Instruction pending receipt of a Change Order, a Change Directive, or, in accordance with the dispute resolution provisions of the General Conditions of Contract, a Notice in Writing of a dispute and instructions to proceed.

END OF SECTION

Part 1 General

1.1 RELATED DOCUMENTS

.1 Construction Drawings, Technical Specifications, Addenda, and general provisions of the Contract, including Contract General Conditions and Supplementary General Conditions and other Division 1 Specification Sections, apply to this Section.

1.2 SECTION INCLUDES

.1 Procedures for submitting requests for interpretation (RFI).

.2 Limitations on use of RFI to obtain interpretation and clarification.

1.3 RELATED SECTIONS

.1 Section 01 33 00 – Submittal Procedures

.2 Section 01 61 00 – Common Product Requirements

1.4 DEFINITIONS

.1 Request for Interpretation: A document submitted by the Contractor requesting clarification of a portion of the Contract Documents, hereinafter referred to as an RFI.

1.5 CONTRACTOR'S REQUESTS FOR INTERPRETATION

.1 Should it be undetermined from the Contract Documents the exact material, process, or system to be installed; or when the elements of construction are required to occupy the same space (interference); or when an item of Work is described differently at more than one place in the Contract Documents; request an interpretation of the requirements of the Contract Documents to resolve such matters. Comply with procedures specified herein to make RFIs.

.2 General:

.1 Immediately on discovery of the need for interpretation of the Contract Documents, prepare and submit an RFI to the Consultant in the form specified.

.2 RFIs submitted directly by subcontractors or material suppliers will be returned unanswered to the Contractor.

.3 Coordinate and submit RFIs in a prompt manner so as to avoid delays in work.

.4 For RFIs submitted electronically, include SMS Engineering project number, project name, and RFI number in subject line of email.

.5 Provide Adobe Acrobat PDF format files for the forms and attachments.

.3 Submission of RFIs:

.1 Prepare RFI’s and submit electronically on a form provided by the Contractor and approved by the Owner's Representative.

.2 Completely fill in forms and submit via an Electronic Project Management (EPM) System agreed upon by the Owner's Representative.

.3 Content of RFI:

.1 Project name.

.2 Project number.

.3 Date.

.4 Name of Contractor.

.5 Name of Consultant.

.6 RFI number, numbered sequentially. (Format: RFI-001)

.7 RFI subject.

.8 Specification Section number and title and related paragraphs, as appropriate.

.9 Drawing number and detail references, as appropriate.

.10 Field dimensions and conditions, as appropriate.

.11 Contractor's suggested resolution. If suggested resolution impacts the Contract Time or the Contract Price, state impact in the RFI.

.12 Attachments: Include sketches, descriptions, measurements, photos, Product Data, Shop Drawings, coordination drawings, and other information necessary to fully describe items needing interpretation. Include dimensions, thicknesses, structural grid references, and details of affected materials, assemblies, and attachments on attached sketches.

.4 Sign all RFIs attesting to good faith effort to determine from the Contract Documents the information requested for interpretation. Electronic signatures are acceptable and subject to authentication. Frivolous RFIs shall be subject to reimbursement from Contractor to Owner for fees charged by Architect, Architect's consultants and other design professionals engaged by the Owner.

.4 Subcontractor-Initiated and Supplier-Initiated RFIs: RFIs from subcontractors and material suppliers shall be submitted through, be reviewed by and be attached to an RFI prepared, signed and submitted by Contractor.

.1 Review all subcontractor- and supplier-initiated RFIs and take actions to resolve issues of coordination, sequencing and layout of the Work.

.2 RFIs submitted to request clarification of issues related to means, methods, techniques and sequences of construction or for establishing trade jurisdictions and scopes of subcontracts will be returned without interpretation. Such issues are solely the Contractor's responsibility.

.3 Contractor shall be responsible for delays resulting from the necessity to resubmit an RFI due to insufficient or incorrect information presented in the RFI.

.5 Requested Information: Carefully study the Contract Documents, in particular, the Contract General Conditions, to ensure that information sufficient for interpretation of requirements of the Contract Documents is not included. RFIs that request interpretation of requirements clearly indicated in the Contract Documents will be returned without interpretation.

.1 In all cases in which RFIs are issued to request clarification of issues related to means, methods, techniques and sequences of construction, for example, pipe and duct routing, clearances, specific locations of Work shown diagrammatically, apparent interferences and similar items, the Contractor shall furnish all information required for the Prime Consultant or Owner's Representative to

analyze and/or understand the circumstances causing the RFI and prepare a clarification or direction as to how the Contractor shall proceed.

.2 If information included with this type RFI by the Contractor is insufficient, the RFI will be returned unanswered.

.6 Do not use RFI's to request the following:

.1 Approval of submittals

.2 Approval of substitutions

.3 Approval of contractor's means and methods

.4 Approval of corrective actions for deficient work

.5 Coordination information already indicated in the Contract Documents

.6 Interpretation of Consultant's actions on submittals

.7 Changes that entail change in Contract Time and Contract Sum (comply with provisions of the Contract General Conditions)

.8 Different methods of performing Work than those indicated in the Contract Drawings and Specifications (comply with provisions of the Contract General Conditions).

.7 RFI Log:

.1 Prepare and maintain a log of RFIs, organized by RFI number, with the following information:

.1 Project name.

.2 Name and address of Contractor.

.3 Name and address of Consultant.

.4 RFI number including RFIs that were returned without action or withdrawn.

.5 RFI description.

.6 Date the RFI was submitted.

.7 Date Consultant's response was received.

.2 Submit log at any time requested by the Owner's Representative and with progress meeting minutes.

.8 Consultant's Action:

.1 Consultant will review each RFI, determine action required, and respond. Allow 10 working days for Consultant's response for each RFI. RFIs received by Consultant after 1:00 p.m. will be considered as received the following working day.

.2 Consultant's action may include a request for additional information, in which case Consultant's time for response will date from time of receipt of additional information.

.3 If Contractor believes the RFI response warrants change in the Contract Time or the Contract Sum, notify Consultant in writing within 10 days of receipt of the RFI response. Comply with the Contract General Conditions.

.9 On receipt of Consultant action, update the RFI log and immediately distribute the RFI response to affected parties. Review response and notify Consultant within 10 days if Contractor disagrees with response.

Part 2 Products

2.1 NOT USED

.1 Not Used

Part 3 Execution

3.1 NOT USED

.1 Not Used

END OF SECTION

Part 1 General

1.1 REFERENCES

.1 Owner/Contractor Agreement.

.2 Canadian Construction Documents Committee (CCDC)

.1 CCDC 2 – 2020, Stipulated Price Contract.

1.2 APPLICATIONS FOR PROGRESS PAYMENT

.1 Refer to CCDC 2 2020.

.2 Make applications for payment on account as provided in Agreement as Work progresses.

1.3 SCHEDULE OF VALUES

.1 Prior to the first application for payment, submit for Consultant's review an initial schedule of values. Modify the initial schedule of values if and as requested by Consultant. Obtain Consultant's written acceptance of the initial schedule of values prior to the first application for payment.

.2 Together with the first and all subsequent applications for payment, submit updated versions of the schedule of values to indicate the values, to the date of application for payment, of work performed and Products delivered to Place of the Work.

.3 Provide the schedule of values in an electronic spreadsheet format based on the format provided and content described in latest edition of CCDC 24 – A Guide to Model Forms and Support Documents.

.4 Provide the schedule of values in an electronic spreadsheet format that provides for inclusion of the following information:

.1 Identifying information including title and location of the Work, name of Contractor, number and date of application for payment, and period covered by the application for payment.

.5 A work breakdown structure based on Contractor breakdown. Include separate line items for closeout procedures including closeout submittals

.1 A work breakdown structure provided by Consultant.

.2 A work breakdown structure that is sufficiently detailed and comprehensive to facilitate Consultant's evaluation of applications for payment at an appropriate level of detail.

.3 Provisions for approved Change Orders allowances so that the breakdown amounts indicated in the schedule of values aggregate to the current total Contract Price. Also provide for indicating the estimated value of Change Directives within the schedule of values, separately from the current total Contract Price.

.4 For each item in the work breakdown structure, provide as a minimum the following information, under headings as indicated:

.1 Breakdown Amount: A dollar amount, including an appropriate pro rata portion of Contactor's overhead and profit.

.2 Performed to Date: The value of Work performed and Products delivered to Place of the Work up to the date of the application for payment, stated as a percentage of the Contract Price and in dollars.

.3 Previously Performed: The value of Work performed and Products delivered to the Place of the Work for which payment has been previously certified, stated in dollars.

.4 Current Period: The value of Work performed and Products delivered to Place of the Work for which Contractor is currently applying for payment, stated in dollars.

.5 Balance to Complete: The value of Work not yet performed and Products not yet delivered to Place of the Work, stated in dollars.

1.4 CASH FLOW PROJECTION

.1 Prior to the first application for payment submit, for Consultant's review, a forecast of approximate monthly progress payments for each month of the Contract Time.

.2 Submit revised cash flow forecasts when required due to significant changes in rate of progress of the Work or significant changes in the Contract Price.

1.5 WORKERS' COMPENSATION CLEARANCE

.1 Submit proof of workers' compensation clearance with each application for payment.

1.6 STATUTORY DECLARATIONS

.1 Submit a statutory declaration in the form of CCDC 9A – Statutory Declaration of Progress Payment Distribution by Contractor with each application for payment except the first.

1.7 PAYMENT FOR PRODUCTS STORED OFF SITE

.1 Owner may, due to extraordinary circumstances and at Owner's sole discretion, make payments for Products delivered to and stored at a location other than Place of the Work, subject to:

.1 a request submitted by Contractor in writing, with appropriate justification, and

.2 whatever conditions Owner or Consultant may establish for such payments, as required to protect Owner's interests.

1.8 SUBSTANTIAL PERFORMANCE OF WORK

.1 Refer to CCDC 2 2020.

.2 Immediately following issuance of certificate of Substantial Performance of Work, in consultation with Consultant, establish reasonable date for finishing Work.

1.9 PAYMENT OF HOLDBACK UPON SUBSTANTIAL PERFORMANCE OF WORK

.1 Refer to CCDC 2 2020.

.2 After issuance of certificate of Substantial Performance of Work:

.1 Submit application for payment of holdback amount.

.2 Submit sworn statement that accounts for labour, subcontracts, products, construction machinery and equipment, and other indebtedness which may have been incurred in Substantial Performance of Work and for which Owner might in be held responsible have been paid in full, except for amounts properly retained as holdback or as identified amount in dispute.

.3 After receipt of application for payment and sworn statement, Consultant will issue certificate for payment of holdback amount.

.4 Owner may retain out of holdback amount sums required by law to satisfy liens against Work or, if permitted by lien legislation applicable to Place of Work, other third party monetary claims against Contractor which are enforceable against Owner.

1.10 PROGRESSIVE RELEASE OF HOLDBACK

.1 Refer to CCDC 2 2020.

1.11 FINAL PAYMENT

.1 Refer to CCDC 2 2020.

Part 2 Products

2.1 NOT USED

.1 Not Used.

Part 3 Execution

3.1 NOT USED

.1 Not Used.

END OF SECTION

Part 1 General

1.1 CONSTRUCTION START-UP MEETING

.1 Promptly after Contract award, Consultant will establish the time and location of a construction start-up meeting to review and discuss administrative procedures and responsibilities. Consultant will notify Contractor at least 5 Working Days before the meeting.

.2 Senior representatives of Owner, Consultant, and Contractor, including Contractor's project manager and site superintendent, and major Subcontractors shall be in attendance.

.3 Consultant's representative will chair the meeting and record and distribute the minutes.

.4 Agenda will include following:

- .1 Appointment of official representatives of Owner, Contractor, Subcontractors, Consultant, and subconsultants.
- .2 Project communications.
- .3 Contract Documents for construction purposes.
- .4 Documents at the site.
- .5 Contractor's use of premises.
- .6 Assignable contracts.
- .7 Work restrictions.
- .8 Substitution procedures.
- .9 Contract modification procedures
  - .1 Proposed changes
  - .2 Change orders
  - .3 Approvals required
  - .4 Mark-up percentages
  - .5 Time extensions
  - .6 Administrative requirements
- .10 Payment procedures.
  - .1 Monthly progress claims
  - .2 Administrative procedures
  - .3 Photographs
  - .4 Holdbacks
- .11 Construction progress meetings.
- .12 Construction progress schedule, including long lead time items and expected deliveries.
- .13 Submittals schedule and procedures.
- .14 Special procedures.
- .15 Quality requirements, including testing and inspection procedures and agencies/firms.
- .16 Contractor's mobilization.

.17 Temporary facilities
- .1 Site signs
- .2 Site offices
- .3 Storage sheds
- .4 Barriers and enclosures
- .5 Controls
- .6 Utilities.

.18 Existing utility services.

.19 Construction facilities.

.20 Field engineering and layout of work.

.21 Site safety.
- .1 Site security.
- .2 Cleaning and waste management.

.22 Closeout procedures and submittals.
- .1 Record drawings
- .2 Maintenance manuals
- .3 Take-over procedures, acceptance, warranties, etc.

.23 Insurances, transcript of policies

.24 Commissioning.

.25 Other items.

1.2 CONSTRUCTION PROGRESS MEETINGS

.1 Schedule regular bi-weekly construction progress meetings for the duration of the Work. Contractor shall prepare meeting agendas, chair the meetings, and record and distribute the minutes.

.2 Arrange for meetings to be attended virtually. It is likely that the Owner and Consultants will not be on site for all meetings.

.3 Arrange for and provide physical space for meetings. Notify parties minimum 5 working days prior to meetings.

.4 Contractor shall record in the meeting minutes significant decisions and identify action items and action dates by attendees or the parties they represent.

.5 Contractor shall distribute copies of minutes within three Working Days after each meeting to attendees and any affected parties who may not be in attendance.

.6 Ensure that Subcontractors attend as and when appropriate to the progress of the Work.

.7 Agenda for each meeting shall include the following, as a minimum:

- .1 Review and approval of minutes of previous meeting.
- .2 Review of work progress since previous meeting.
- .3 Field observations, including any problems, difficulties, or concerns.
- .4 Review of construction progress schedule, including:
  - .1 Impedances to schedule

.2 Corrective measures to regain project schedule

.3 Revisions to project schedule

.5 Review of submittals schedule, including:

.1 Off site fabrication and delivery schedules

.6 Proposed changes in the Work.

.7 Requests for information.

.8 Maintenance of quality standards.

.9 Site safety issues.

.10 Other business.

END OF SECTION

Part 1 General

1.1 WORK INCLUDED

.1 Section covers scheduling of work activities, including:

- .1 Other work at site.
- .2 Hours of Work.
- .3 Change of Contract Times.
- .4 Liquidated damages.
- .5 Suspension of Work and delays.
- .6 No damages for delays.

1.2 RELATED SECTIONS

.1 CCDC 2-2020 – Stipulated Price Contract

.2 Section 00 70 00 – Conditions of the Contract

.3 Section 00 73 00 – Supplementary Conditions

.4 Section 01 14 00 – Work Restrictions

.5 Section 01 26 00 – Contract Modification Procedures.

1.3 SUBMITTALS SCHEDULE

.1 Refer to 01 32 16 – Construction Progress Schedule.

Part 2 Products

2.1 NOT USED

.1 Not Used

Part 3 Execution

3.1 OWNER OCCUPANCY

.1 Schedule new work so normal functions within building are not unduly interrupted.

.2 Service Interruptions:

- .1 Arrange work so that interruption of services is kept to minimum.
- .2 Obtain permission from Consultant prior to cutting into mechanical services.
- .3 Where deemed necessary by Consultant temporary piping to be installed and/or work to be carried out at night and on weekends.

.4 Suitable periods for shutting off mechanical and electrical services to be arranged with Owner's appointed representative. Perform work requiring shutdown of air systems during night period or on weekends.

3.2 CHANGE OF CONTRACT TIMES

.1 The date of beginning and the time for completion of the Work are essential conditions of the Contract Documents and the Work embraced shall commence on date specified in the Contract.

.2 Proceed with the Work at such rate of progress to ensure full completion within the Contract Time. It is expressly understood and agreed, by and between Contractor and Owner, that the Contract Time for the completion of the Work described herein is a reasonable time, taking into consideration the climatic and economic conditions and other factors prevailing in the locality of the Work.

.3 Changed conditions and Change Orders, abnormal or unusual weather conditions, labor strikes, and delays caused by various governmental activities, or as defined below, may be the basis for extending the period for performance. Because these various reasons for delay can have cumulative effect or actually have no effect, Contractor shall request, in writing on a monthly basis, time extensions and discuss these requests with Consultant to determine whether or not a time extension can be recommended. Should a time extension be granted by Owner, a Change Order, signed by Owner, will be issued to indicate the new date for completion.

3.3 SUSPENSION OF WORK AND DELAYS

.1 Contractor agrees that Owner may suspend the Work, or any part of the Work, without invalidating the Contract. Under no circumstance will a suspension absolve Contractor or Contractor’s sureties of the duties and responsibilities guaranteed under the Bnd(s). Any order of suspension must be signed by Owner.

.2 The Work, or any part of the Work, may be suspended for the convenience of Owner, or in response to an order of a provincial or federal court, or on the grounds that Contractor is in default of any of the Contract conditions.

.3 Suspension of the Work for Owner’s Convenience: Upon decision to suspend the Work or any part of the Work for Owner’s convenience, the order of suspension will extend the Contract Time for the number of days of such suspension, but not to exceed ninety (90) days, if all Work is suspended. If the suspension applies to only a part of the Work, a time extension will not be authorized until that part of Work has resumed and the partial suspension’s effect on the entire Contract can be evaluated. In all cases of suspension for Owner’s convenience, the costs to Contractor will be determined on the basis of a cost adjustment but with no credit given to Contractor for anticipated profits. Upon receiving an order of such suspension, Contractor shall immediately begin to perform in a manner designed to reduce to a minimum the costs of protecting the Work and maintaining it in a condition that shall permit its resumption for the least possible start-up cost.

.4 Suspension Because of Order of Provincial or Federal Court: Refer to CCDC 2-2020

.5 Suspension or Delay Because of Archaeological, Paleontological, and Historical Discoveries: Contractor shall immediately inform Consultant and Owner of any evidence that may suggest that archaeological, paleontological, or historical materials may be

present in the Work area. Consultant and/or Owner will, immediately notify the required authorities.

.1 Upon making such a discovery, Contractor shall do whatever is necessary to avoid disturbing that part of the Work area and to preserve the discovery site. This may require that Contractor's activities be redirected or stopped completely until a determination of the significance of the discovery is made and how Work is to proceed.

.2 If, as a result of Contractor's efforts to preserve the potential discovery site, Contractor's activities are delayed or suspended for longer than eight (8) normal working-time hours, Contractor shall begin to prepare accounting information to support an adjustment to the Contract Price or Contract Time, or both.

.6 Suspension Resulting from Contractor's Failure of Performance: If an order of suspension results from Contractor being in default of provisions of the Contract, the order will identify the reason, or reasons, for the order. In this circumstance, Contractor will not be authorized a time extension and costs to Contractor resulting from such an order of suspension will not be reimbursed by Owner. An order of suspension issued under these circumstances will remain in effect until Contractor has acted to remove the grounds for the suspension. Contractor, during the time of suspension, is responsible for maintenance and safety of the Project site.

END OF SECTION

Part 1 General

1.1 SECTION INCLUDES

.1 Preliminary schedule.

.2 Construction progress schedule, bar chart type.

.3 Construction progress schedule, with network analysis diagrams and reports.

1.2 RELATED SECTIONS

.1 Section 01 11 00 – Summary of Work.

1.3 DEFINITIONS

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

.2 Actual Finish Date (AF): point in time that Work actually ended on activity

.3 Actual Start Date (AS): point in time that Work actually started on activity.

.4 Bar Chart (Gantt chart): graphic display of schedule-related information. In typical bar chart, activities or other Project elements are listed down left side of chart, dates are shown across top, and activity durations are shown as date-placed horizontal bars.

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

.6 Completion Milestones: they are firstly Ready for Takeover, Interim Certificate, and/or Substantial Completion, and secondly Final Certificate.

.7 Constraint: applicable restriction that will affect performance of Project. Factors that affect activities can be scheduled.

.8 Control: process of comparing actual performance with planned performance, analyzing variances, evaluating possible alternatives, and taking appropriate corrective action as needed.

.9 Critical Activity: any activity on a critical path. Most commonly determined by using critical path method.

.10 Critical Path: series of activities that determines duration of Project. In deterministic model, critical path is usually defined as those activities with float less than or equal to specified value, often zero. It is longest path through Project.

.11 Critical Path Method (CPM): network analysis technique used to predict Project duration by analyzing which sequence of activities (which path) has least amount of scheduling flexibility (least amount of float).

.12 Data Date (DD): date at which, or up to which, Project's reporting system has provided actual status and accomplishments.

.13 Duration (DU): number of work periods (not including holidays or other non-working periods) required to complete activity or other Project element. Usually expressed as workdays or work weeks.

.14 Early Finish Date (EF): in critical path method, earliest possible point in time on which uncompleted portions of activity (or Project) can finish, based on network logic and schedule constraints. Early finish dates can change as Project progresses and changes are made to Project plan.

.15 Early Start Date (ES): in critical path method, earliest possible point in time on which uncompleted portions of activity (or Project) can start, based on network logic and schedule constraints. Early start dates can change as Project progresses and changes are made to Project Plan.

.16 Finish Date: point in time associated with activity's completion. Usually qualified by one of following: actual, planned, estimated, scheduled, early, late, baseline, target, or current.

.17 Float: amount of time that activity may be delayed from its early start without delaying Project finish date. Float is mathematical calculation, and can change as Project progresses and changes are made to Project plan.

.18 Lag: modification of logical relationship that directs delay in successor task.

.19 Late Finish Date (LF): in critical path method, latest possible point in time that activity may be completed without delaying specified milestone (usually Project finish date).

.20 Late Start Date (LS): in critical path method, latest possible point in time that activity may begin without delaying specified milestone (usually Project finish date).

.21 Lead: modification of logical relationship that allows acceleration of successor task.

.22 Logic Diagram: see Project network diagram.

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

.24 Milestone: significant event in Project, usually completion of major deliverable.

.25 Monitoring: capture, analysis, and reporting of Project performance, usually as compared to plan.

.26 Near-Critical Activity: activity that has low total float.

.27 Non-Critical Activities: activities which when delayed, do not affect specified Contract duration.

.28 Project Control System: fully computerized system utilizing commercially available software packages.

.29 Project Network Diagram: schematic display of logical relationships of Project activities. Always drawn from left to right to reflect Project chronology.

.30 Project Plan: formal, approved document used to guide both Project execution and Project control. Primary uses of Project plan are to document planning assumptions and decisions, facilitate communication among stakeholders, and document approved scope, cost, and schedule baselines. Project plan may be summary or detailed.

.31 Project Planning: development and maintenance of Project Plan.

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

.33 Quantified days duration: working days based on 5 day work week, discounting statutory holidays.

.34 Risk: uncertain event or condition that, if it occurs, has positive or negative effect on Project's objectives.

.35 Scheduled Finish Date (SF): point in time that Work was scheduled to finish on activity. Scheduled finish date is normally within range of dates delimited by early finish date and late finish date.

.36 Scheduled Start Date (SS): point in time that Work was scheduled to start on activity. Scheduled start date is normally within range of dates delimited by early start date and late start date.

.37 Start Date: point in time associated with activity's start, usually qualified by one of following: actual, planned, estimated, scheduled, early, late, target, baseline, or current.

.38 Work Breakdown Structure (WBS): deliverable-oriented grouping of project elements that organizes and defines total Work scope of Project. Each descending level represents increasingly detailed definition of Project Work.

1.4 SUBMITTALS

.1 Submit preliminary schedule to Consultant within 10 days after date of Agreement.

.2 If preliminary schedule requires revision after review, submit revised schedule within 10 days of return of review copy.

.3 Within 20 days after review of preliminary schedule, submit draft of proposed complete schedule for review.

.1 Include written certification that major contractors have reviewed and accepted proposed schedule.

.4 Within 10 days after joint review, submit complete schedule.

.5 Submit updated schedule monthly or with each Application for Payment.

.6 Form and Content:

.1 Prepare schedule identifying all required Shop Drawing, Product data, and sample submissions, including samples required for testing and including those for Owner supplied Products.

.2 Provide a separate line for each required submittal, organized by Specification section names and numbers and further broken down by individual Products and systems as required.

.3 For each required submittal, show planned earliest date for initial submittal, earliest date for return of reviewed submittal by Consultant and latest date for return of reviewed submittal without causing delay.

.4 Allow time in schedule for resubmission of submittals, should resubmission be necessary.

.5 Submit in electronic PDF format via email to contractadmin@smseng.com .

.6 Submit the number of hard copy reproductions that Contractor requires, plus two copies that will be retained by Consultant.

.7 Submit under transmittal letter form with information as specified in Section 01 33 00 – Submittal Procedures.

1.5 QUALITY ASSURANCE

.1 Provide scheduling personnel or specialist consultant from start of construction to Final Certificate, including Commissioning to perform scheduling of construction work.

1.6 SCHEDULE FORMAT

.1 Listings: In chronological order according to the start date for each activity. Identify each activity with the applicable specification section number.

.2 Diagram Sheet Size: Maximum 275 x 432 mm (11 x 17 inches).

.3 Sheet Size: Multiples of 216 x 280 mm (8-1/2 x 11 inches).

.4 Scale and Spacing: To allow for notations and revisions.

Part 2 Products

2.1 NOT USED

.1 Not Used

Part 3 Execution

3.1 PRELIMINARY SCHEDULE

.1 Prepare preliminary schedule in the form of a horizontal bar chart.

3.2 CONTENT

.1 Show complete sequence of construction by activity, with dates for beginning and completion of each element of construction.

.2 Identify each item by specification section number.

.3 Identify work of separate stages and other logically grouped activities.

.4 Provide sub-schedules for each stage of Work.

.5 Provide sub-schedules to define critical portions of the entire schedule.

.6 Include conferences and meetings in schedule.

.7 Show accumulated percentage of completion of each item, and total percentage of Work completed, as of the first day of each month.

.8 Provide separate schedule of submittal dates for Shop Drawings, product data, and samples, owner-furnished products, products identified under Allowances, and dates reviewed submittals will be required from Consultant. Indicate decision dates for selection of finishes.

.9 Indicate delivery dates for owner-furnished products.

.10 Coordinate content with schedule of values specified in Section 01 29 00 – Payment Procedures.

.11 Provide legend for symbols and abbreviations used.

3.3 BAR CHARTS

.1 Include a separate bar for each major portion of Work or operation.

.2 Identify the first work day of each week.

3.4 NETWORK ANALYSIS

.1 Prepare network analysis diagrams and supporting mathematical analyses using the Critical Path Method.

.2 Illustrate order and interdependence of activities and sequence of work; how start of a given activity depends on completion of preceding activities, and how completion of the activity may restrain start of subsequent activities.

.3 Mathematical Analysis: Tabulate each activity of detailed network diagrams, using calendar dates, and identify for each activity:

.1 Preceding and following event numbers.
.2 Activity description.
.3 Estimated duration of activity, in maximum 15 day intervals.
.4 Earliest start date.
.5 Earliest finish date.
.6 Actual start date.
.7 Actual finish date.
.8 Latest start date.
.9 Latest finish date.

.10 Total and free float; float time shall accrue to Owner and to Owner's benefit.

.11 Monetary value of activity, keyed to Schedule of Values.

.12 Percentage of activity completed.

.13 Responsibility.

.4 Analysis Program: Capable of compiling monetary value of completed and partially completed activities, accepting revised completion dates, and recomputation of all dates and float.

.5 Cash Flow Forecast: Submit a cash flow forecast indicating projected expenditures against the Contract Price Schedule, and on which monthly progress payments will be evaluated against during the administration of the contract by the Consultant.

.6 Required Reports: List activities in sorts or groups:

.1 By preceding work item or event number from lowest to highest.

.2 By amount of float, then in order of early start.

.3 By responsibility in order of earliest possible start date.

.4 In order of latest allowable start dates.

.5 In order of latest allowable finish dates.

.6 Contractor’s periodic payment request sorted by Schedule of Values listings.

.7 Listing of basic input data that generates the report.

.8 Listing of activities on the critical path.

3.5 REVIEW AND EVALUATION OF SCHEDULE

.1 Participate in joint review and evaluation of schedule with Consultant at each submittal.

.2 Evaluate project status to determine work behind schedule and work ahead of schedule.

.3 After review, revise as necessary as result of review, and resubmit within 10 days.

3.6 UPDATING SCHEDULE

.1 Maintain schedules to record actual start and finish dates of completed activities.

.2 Indicate progress of each activity to date of revision, with projected completion date of each activity.

.3 Annotate diagrams to graphically depict current status of Work.

.4 Identify activities modified since previous submittal, major changes in Work, and other identifiable changes.

.5 Indicate changes required to maintain Date of Substantial Completion.

.6 Submit reports required to support recommended changes.

.7 Provide narrative report to define problem areas, anticipated delays, and impact on the schedule. Report corrective action taken or proposed and its effect.

3.7 DISTRIBUTION OF SCHEDULE

.1 Distribute copies of updated schedules to Contractor's project site file, to subcontractors, suppliers, Consultant, Owner, and other concerned parties.

.2 Instruct recipients to promptly report, in writing, problems anticipated by projections indicated in schedules.

END OF SECTION

Part 1 General

1.1 ADMINISTRATIVE

.1 Submit specified submittals to Consultant for review. Submit with reasonable promptness and in orderly sequence so as to not cause delay in the Work. Failure to submit in ample time is not considered sufficient reason for an extension of Contract Time or for Product substitutions or other deviations from the Drawings and Specifications.

.2 Where required by authorities having jurisdiction, provide submittals to such authorities for review and approval.

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

.4 Present Shop Drawings, Product data, and samples in SI metric units. Where items or information is not produced in SI Metric units, converted values are acceptable.

.5 Review submittals, provide verified field measurements where applicable, and affix Contractor’s review stamp prior to submission to Consultant. Contractor’s review stamp represents that necessary requirements have been determined and verified, and that the submittal has been checked and coordinated with requirements of the Work and Contract Documents.

.6 Verify field measurements and that affected adjacent work is coordinated.

.7 Submittals not meeting specified requirements will be returned with comments.

.8 Reproduction of construction Drawings to serve as background for Shop Drawings is not permitted.

.9 Do not propose Substitutions or deviations from Contract Documents via Shop Drawing, Product data and sample submittals.

.10 Contractor's responsibility for errors and omissions, or deviations to Contract Documents, in submission is not relieved by Consultant's review of submittals.

.11 Maintain one reviewed copy of each submission at the project site.

1.2 SHOP DRAWINGS AND PRODUCT DATA

.1 Indicate Products, methods of construction, and attachment or anchorage, erection diagrams, connections, explanatory notes and other information necessary for completion of the Work.

.2 Where Products attach or connect to other Products, indicate that such items have been coordinated, regardless of Section under which adjacent items will be supplied and installed. Indicate cross-references to Drawings, Specifications and other already reviewed Shop Drawings.

.3 Accompany submittals with a transmittal including the following information:

.1 Date

.2 Project title and number.

.3 Contractor's name and address.

.4 Identification of each submittal item and quantity.

.5 Other pertinent data.

.4 Shop Drawing submittals shall include:

.1 Date and revision dates.

.2 Project title and number.

.3 Name and address of:

.1 Subcontractor.

.2 Supplier.

.3 Manufacturer.

.4 Contractor's stamp, date, and signature of Contractor's authorized representative responsible for Shop Drawing review, indicating that each Shop Drawing has been reviewed for compliance with Contract Documents and, where applicable, that field measurements, capacities, quantities, sizes, and other data have been verified.

.5 Details of appropriate portions of the 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 Relationships to other parts of the Work.

.5 Product data submittals shall include material safety data sheets (MSDS) for all controlled Products.

.6 Clearly show division of responsibility. No item, equipment or description of work shall be indicated to be supplied or work to be done "By Other's or By Purchaser". Any item, equipment or description of work shown on shop drawings shall form part of contract, unless specifically noted to contrary.

.7 Submit electronic PDF copy of Shop Drawings where specified in the technical Specifications.

.8 Submit electronic PDF copy of Product data sheets or brochures where specified in the technical Specifications.

.9 Submit electronic PDF copy of test reports for requirements requested in specification Sections and as requested by Consultant.

.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 accord with specified requirements.

.10 Submit electronic PDF copy of certificates for requirements requested in specification Sections and as requested by Consultant.

.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.

.11 Submit electronic PDF copy of manufacturers instructions for requirements requested in specification Sections and as requested by Consultant.

.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.

.12 Submit electronic PDF copy of Manufacturer's Field Reports for requirements requested in specification Sections and as requested by Consultant.

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

.13 Submit electronic PDF copy of Operation and Maintenance Data for requirements requested in specification Sections and as requested by Consultant.

.14 Where a submittal includes information not applicable to the Work, clearly identify applicable information and strike out non-applicable information.

.15 Supplement standard information to include details applicable to Project.

.16 Allow 10 Working Days for Consultant's review of each submittal and incorporate in submittals schedule specified in Section 01 32 16 – Construction Progress Schedule. Allow additional 2 Working Days where sub-Consultant or commissioning agent review is required.

.17 If upon Consultant’s review no errors or omissions are discovered, or if only minor corrections are required as indicated, submittal will be returned and fabrication or installation of Work may proceed.

.18 If upon Consultant’s review significant errors or omissions are discovered, a so noted copy will be returned for correction and resubmission. Do not commence fabrication or installation.

.19 Resubmit corrected submittals through same procedure indicated above, before any fabrication or installation of the Work proceeds. When resubmitting, notify Consultant in writing of any revisions other than those requested by Consultant.

.20 Consultant’s notations on submittals are intended to ensure compliance with Contract Documents and are not intended to constitute a change in the Work requiring change to the Contract Price or Contract Time. If Contractor considers any Consultant’s notation to

be a change in the Work, promptly notify Consultant in writing before proceeding with the Work.

.21 The review of shop drawings by Consultant is for sole purpose of ascertaining conformance with general concept.

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

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

.3 In case where fabrication must proceed prior to field dimensions being available, check all shop drawings and approve for dimensions only. In this case guarantee that dimensions will be worked to and ensure that other sub-trades are aware of these dimensions and shall comply to them.

1.3 SAMPLES

.1 Submit samples for Consultant’s review in duplicate where specified in the technical Specifications. Label samples as to origin, Project name, and intended use.

.2 Deliver samples prepaid to Consultant's business address.

.3 Notify Consultant in writing of any deviations in samples from requirements of Contract Documents.

.4 Where a required colour, pattern or texture has not been specified, submit full range of available Products meeting other specified requirements.

.5 Consultant selection from samples is not intended to change the Contract Price or Contract Time. If a selection would affect the Contract Price or Contract Time, notify Consultant in writing prior to proceeding with the Work.

.6 Resubmit samples as required by Consultant to comply with Contract Documents.

.7 Reviewed and accepted samples will establish the standard against which installed Work will be reviewed.

1.4 PROGRESS PHOTOGRAPHS

.1 Submit photographs with each application for payment, taken not more than 3 days prior to submission of application for payment.

.2 Submit new photographs at least once a month, within 3 days after being taken.

.3 Maintain one set of all photographs at project site for reference; same copies as submitted, identified as such.

.4 Photography Type: Digital; electronic files.

.5 Provide photographs of site and construction throughout progress of work produced by an experienced photographer, acceptable to Consultant.

.6 In addition to periodic, recurring views, take photographs of each of the following events:

.1 Completion of site clearing.
.2 Excavations in progress.
.3 Foundations in progress and upon completion.
.4 Structural framing in progress and upon completion.
.5 Enclosure of building, upon completion.
.6 Final completion, minimum of ten (10) photos.

.7 Views:

.1 Provide aerial photographs from four cardinal views at each specified time, until structure is enclosed.
.2 Provide non-aerial photographs from four cardinal views at each specified time, until date of Substantial Performance.
.3 Consult with Consultant for instructions on views required.
.4 Provide factual presentation.
.5 Provide correct exposure and focus, high resolution and sharpness, maximum depth of site, and minimum distortion.
.6 Point of View Sketch: Provide sketch identifying point of view of each photograph.

.8 Digital Photographs: 24 bit colour, minimum resolution of 1024 by 768, in JPG format; provide files unaltered by photo editing software.

.1 Delivery Medium: Via email.
.2 File Naming: Include project identification, date and time of view, and view identification.
.3 Point of View Sketch: Include digital copy of point of view sketch with each digital submittal; include point of view identification in each photo file name.
.4 PDF File: Assemble all photos into printable pages in PDF format, with 2 to 3 photos per page, each photo labeled with file name; one PDF file per submittal.

Part 2 Products

2.1 NOT USED

.1 Not Used.

Part 3 Execution

3.1 NOT USED

.1 Not Used.

END OF SECTION

Part 1 General

1.1 RELATED REQUIREMENTS

.1 Section 011400 – Work Restrictions.

.2 Section 015600 – Temporary Barriers and Enclosures

.3 Section 015700 – Temporary Controls.

1.2 SECURITY PROGRAM

.1 Protect Work, existing premises and Owner's operations from theft, vandalism, and unauthorized entry.

.2 Initiate program at project mobilization. Report on program at construction start-up meeting.

.3 Initiate program in coordination with Owner's existing security system at project mobilization.

.4 Maintain program throughout construction period until Owner occupancy.

.5 Maintain program throughout construction period until Owner acceptance precludes the need for Contractor security.

.6 Maintain program throughout construction period until directed by Consultant. Provide update reports at regular construction progress meetings.

1.3 ENTRY CONTROL

.1 Restrict entrance of persons and vehicles into Project site and existing facilities.

.2 Allow entrance only to authorized persons with proper identification.

.3 Maintain log of workers and visitors, make available to Owner on request.

.4 Owner will control entrance of persons and vehicles related to Owner's operations.

.5 Contractor shall control entrance of persons and vehicles related to Owner's operations.

.6 Coordinate access of Owner's personnel to site in coordination with Owner's security forces.

1.4 PERSONNEL IDENTIFICATION

.1 Provide identification badge to each person authorized to enter premises.

.2 Badge To Include: Personal photograph, name, assigned number, expiration date and employer.

.3 Maintain a list of accredited persons, submit copy to Owner on request.

.4 Require return of badges at expiration of their employment on the Work.

Part 2 Products

2.1 NOT USED

.1 Not Used.

Part 3 Execution

3.1 NOT USED

.1 Not Used.

END OF SECTION

Part 1 General

1.1 REFERENCE STANDARDS

.1 "Reference standards" means consensus standards, trade association standards, guides, and other publications expressly referenced in Contract Documents.

.2 Where an edition or version date is not specified, referenced standards shall be deemed to be the latest edition or revision issued by the publisher at the time of bid closing. However, if a particular edition or revision date of a specified standard is referenced in an applicable code or other regulatory requirement, the regulatory referenced edition or version shall apply.

.3 Reference standards establish minimum requirements. If Contract Documents call for requirements that differ from a referenced standard, the more stringent requirements shall govern.

.4 If compliance with two or more reference standards is specified and the standards establish different or conflicting requirements, comply with the most stringent requirement. Refer uncertainties to Consultant for clarification.

.5 Within the Specifications, reference may be made to the following standards writing, testing, or certification organizations by their acronyms or initialisms:

.1 AA - Aluminum Association
.2 AABC – Associated Air Balance Council
.3 ACI - American Concrete Institute
.4 AISC - American Institute of Steel Construction
.5 ANSI - American National Standards Institute
.6 ASME - American Society of Mechanical Engineers
.7 ASTM - American Society for Testing and Materials
.8 AWMAC - Architectural Woodwork Manufacturers Association of Canada
.9 AWPA - American Wire Producers Association
.10 CaGBC - Canadian Green Building Council
.11 CGSB - Canadian General Standards Board
.12 CISC - Canadian Institute of Steel Construction
.13 CPCI - Canadian Prestressed Concrete Institute
.14 CSA - Canadian Standards Association
.15 CSSBI - Canadian Sheet Steel Building Institute
.16 CWB – Canadian Welding Bureau
.17 ICEA - Insulated Cable Engineers Association
.18 IEEE - Institute of Electrical and Electronics Engineers
.19 IGMAC – Insulating Glass Manufacturers Association of Canada
.20 LEED - Leadership in Energy and Environmental Design
.21 MPP – Master Painters Institute
.22 MSS - Manufacturers Standardization Society of the Valve and Fittings Industry

.23 NAAMM - National Association of Architectural Metal Manufacturers
.24 NEMA - National Electrical Manufacturers Association
.25 NFPA - National Fire Protection Association
.26 NHLA - National Hardwood Lumber Association
.27 NLGA - National Lumber Grades Authority
.28 SSPC – The Society for Protective Coatings
.29 TTMAC - Terrazzo, Tile and Marble Association of Canada
.30 ULC - Underwriters' Laboratories of Canada

1.2 REFERENCES

.1 Canadian Construction Documents Committee (CCDC)

.1 CCDC 2 – 2020, Stipulated Price Contract.

.2

1.3 ENGINEERING OBSERVATIONS

.1 The term "Consultant" in all mechanical and electrical sections of specification shall mean:

SMS Engineering Ltd.
770 Bradford Street
Winnipeg, Manitoba
R3H 0N3

.2 Contractor's work will be observed periodically, solely for purpose of determining general quality of work, and not for any other purpose. Allow Consultant access to the Work. If part of Work is in preparation at locations other than Place of Work, allow access to such Work whenever it is in progress.

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

.4 Guidance will be offered to Contractor in interpretation of plans and specifications to assist in carrying out work.

.5 Observations and directives given to Contractor does not relieve Contractor and their agents, servants and employees of their responsibility to erect and install work in all its parts in a safe and workmanlike manner, and in accordance with all relevant codes, standards, plans and specifications, nor does it impose upon Owner, and/or Consultant or their representatives, any responsibility to supervise or oversee erection or installation of any work.

.6 The Consultant is not responsible for inspection of the Contractor’s work. The Consultant maintains the right to observe the work at its sole discretion. In addition to the above, Contractor's work may be observed periodically by Owner, and/or Consultant or their representatives, without notice or without request from Contractor.

.7 Notify Consultant of completion of work at various stages, including special tests. Notification shall be made where mechanical and/or electrical work is involved. Provide

minimum 5 working day's notice, whereupon the Consultant may visit site to periodically observe the work:

.1 At completion of excavation,
.2 Before back-filling.
.3 Before structural pours,
.4 After mechanical equipment is installed into final location, but before energization.
.5 After main piping and ducting are installed and terminated.
.6 Before closing walls and ceilings,
.7 At first energization of equipment,
.8 At commissioning,
.9 At final completion of project,
.10 At demonstration of operation of mechanical equipment.

.8 Where observation reports are submitted, the Contractor is responsible for rectifying issues noted in the Observation Reports in a timely manner and before covering up the work or affecting access to it.

1.4 INDEPENDENT INSPECTION AND TESTING AGENCIES

.1 Except as otherwise specified, Owner will retain and pay for independent inspection and testing agencies to inspect, test, or perform other quality control reviews of parts of the Work.

.2 Retain and pay for inspection and testing that is for Contractor's own quality control or is required by regulatory requirements.

.3 Section 01 21 00 – Allowances specifies a cash allowance for independent inspection and testing services to be retained and paid for by Contractor. Cash allowance excludes any inspection and testing that is for Contractor's own quality control or is required by regulatory requirements.

.4 Employment of inspection and testing agencies by Contractor or Owner does not relieve Contractor from responsibility to perform the Work in accordance with Contract Documents.

.5 Allow and arrange for inspection and testing agencies to have access to the Work, including access to off site manufacturing and fabrication plants.

.6 For inspection and testing required by Contract Documents or by authorities having jurisdiction, provide Consultant and inspection and testing agencies with timely notification in advance of required inspection and testing.

.7 Submit test samples required for testing in accordance with submittals schedule specified in Section 01 32 16 – Construction Progress Schedule.

.8 Provide labour, Construction Equipment and temporary facilities to obtain and handle test samples on site.

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

1.5 INSPECTION AND TESTING AGENCY REPORTS

.1 For inspection and testing required by Contract Documents or by regulatory requirements, and performed by Contractor retained inspection and testing agencies, submit to Consultant and Owner copies of reports. Submit within 5 days after completion of inspection and testing.

.2 For inspection and testing performed by Owner retained inspection and testing agencies, copies of inspection and testing agency reports will be provided to Contractor.

1.6 MILL TESTS

.1 Submit mill test certificates as required of specification Sections.

1.7 PROCEDURES

.1 Notify appropriate agency and Consultant in advance of requirement for tests, in order that attendance arrangements can be made.

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

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

1.8 REJECTED WORK

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

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

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

END OF SECTION

Part 1 General

1.1 SUMMARY

.1 This Section references to laws, by laws, ordinances, rules, regulations, codes, orders of Authority Having Jurisdiction, and other legally enforceable requirements applicable to Work and that are; or become, in force during performance of Work.

1.2 SUMMARY OF GOVERNING BUILDING CODES AND STANDARDS

.1 MBC – Manitoba Building Code; 2023

.2 MFC – Manitoba Fire Code; 2023

.3 MECB – Manitoba Energy Code for Buildings; 2023

.4 CSA B651 - Accessible Design for the Built Environment; 2018.

.5 NBC – National Building Code of Canada; 2020.

.6 NECB – National Energy Code for Buildings; 2020

1.3 REFERENCES TO REGULATORY REQUIREMENTS

.1 Perform Work in accordance with the referenced Building Codes, local regulations, by-laws, and specified standards including amendments up to tender closing date and other codes of provincial or local application provided that in case of conflict or discrepancy, the more stringent requirements will prevail. Before any work is proceeded with, approved layouts to be filed with and approved by proper authorities.

.2 Specific design and performance requirements listed in Specifications or indicated on Drawings may exceed minimum requirements established by referenced Building Code; these requirements will govern over the minimum requirements listed in Building Code and will meet or exceed the requirements of the:

.1 Contract Documents;

.2 Specified standards, codes and referenced documents.

.3 Provide necessary notices, obtain permits and pay all fees, in order that work specified may be carried out. Carry out changes and alterations required by authorized inspector of any authority having jurisdiction without charge or expense to Owner. Pay all charges for service connections to municipal mains.

.4 Furnish certificates confirming work installed conforms to requirements of authorities having jurisdiction.

1.4 RELATED REQUIREMENTS

.1 Section 01 40 00 - Quality Requirements.

1.5 QUALITY ASSURANCE

.1 Refer to Section - 01 40 00 - Quality Requirements.

1.6 HAZARDOUS MATERIAL DISCOVERY

.1 Asbestos: demolition of spray or trowel-applied asbestos is hazardous to health. Stop work immediately when material resembling spray or trowel-applied asbestos is encountered during demolition work. Notify Consultant.

.2 PCB: Polychlorinated Biphenyl: stop work immediately when material resembling Polychlorinated Biphenyl is encountered during demolition work. Notify Consultant.

.3 Mould: stop work immediately when material resembling mould is encountered during demolition work. Notify Consultant.

1.7 BUILDING SMOKING ENVIRONMENT

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

Part 2 Products

2.1 NOT USED

.1 Not Used

Part 3 Execution

3.1 NOT USED

.1 Not Used

END OF SECTION

Part 1 General

1.1 SUMMARY

.1 Other references are included in individual specification sections.

1.2 TERMINOLOGY

.1 Wherever the singular, plural, masculine, feminine, or neuter is used throughout the same shall be construed as meaning the singular, plural, masculine, feminine, and neuter where the facts or context so requires.

Part 2 Products

2.1 NOT USED

.1 Not Used

Part 3 Execution

3.1 NOT USED

.1 Not Used

END OF SECTION

Part 1 General

1.1 SUMMARY

.1 Other abbreviations and acronyms are included in individual specification sections.

1.2 ABBREVIATIONS AND ACRONYMS

.1 General: If duplication of abbreviations exist between this Section and any other Section, this Section shall take precedent unless specifically noted to the contrary in the other Section.

.2 AHJ - Authority Having Jurisdiction

.3 ANSI - American National Standards Institute

.4 ASME - American Society of Mechanical Engineers

.5 ASSE - American Society of Sanitary Engineers

.6 ASPE - American Society of Plumbing Engineers

.7 ASTM - American Society for Testing and Materials

.8 AWWA - American Water Works Association

.9 CCDC - Canadian Construction Documents Committee

.10 CWA - Canadian Welding Association

.11 MCAC - Mechanical Contractors Association of Canada

.12 MSS - Manufacturer's Standardization Society of the Valve & Fitting Industry, Inc.

.13 NFPA - National Fire Protection Association

.14 NEMA - National Electric Manufacturers Association

.15 PVC - Poly-Vinyl Chloride

.16 TAB - Testing, Adjusting, and Balancing

Part 2 Products

2.1 NOT USED

.1 Not Used

Part 3 Execution

3.1 NOT USED

.1 Not Used

END OF SECTION

Part 1 General

1.1 SUMMARY

.1 This section supplements the definitions contained in the General Conditions.

.2 Other definitions are included in individual specification sections.

1.2 TERMINOLOGY:

.1 Wherever the singular, plural, masculine, feminine, or neuter is used, the same shall be construed as meaning the singular, plural, masculine, feminine, and neuter where the facts or context so requires.

1.3 DEFINITIONS

.1 “includes" and “including”: mean includes or including without limiting the generality of the foregoing.

.2 Supply: To procure, deliver, unload, and inspect for damage.

.3 Install: To unpack, assemble, erect, apply, place, finish, cure, protect, clean, start up, and make ready for use.

.4 Product: Material, machinery, components, equipment, fixtures, and systems forming the work result. Not materials or equipment used for preparation, fabrication, conveying, or erection and not incorporated into the work result. Products may be new, never before used, or re-used materials or equipment.

.5 Project Manual: The book-sized volume that includes the procurement requirements (if any), the contracting requirements, and the specifications.

.6 Provide: To supply and install.

Part 2 Products

2.1 NOT USED

.1 Not Used

Part 3 Execution

3.1 NOT USED

.1 Not Used

END OF SECTION

Part 1 General

1.1 TEMPORARY UTILITIES - GENERAL

.1 Provide temporary utilities as specified and as otherwise necessary to perform the Work expeditiously.

.2 Remove temporary utilities after use.

1.2 TEMPORARY WATER SUPPLY

.1 Connect to and use Owner's existing water supply for temporary use during construction, subject to existing available volume and pressure. Usage at no cost to Contractor.

1.3 TEMPORARY HEATING AND VENTILATION

.1 Provide temporary heat for the Work as required to:

- .1 Facilitate progress of Work.
- .2 Protect the Work against dampness and cold.
- .3 Prevent moisture condensation on surfaces, freezing, or other damage to finishes or stored Products.
- .4 Maintain specified minimum ambient temperatures and humidity levels for storage, installation and curing of Products.
- .5 After building is enclosed, maintain interior temperature of minimum 10 degrees Celsius.

.2 Provide temporary ventilation for the Work as required to:

- .1 Meet health regulations for safe working environment.
- .2 Prevent accumulations of fumes, exhaust, vapours, gases and other hazardous, noxious, or volatile substances in enclosed spaces, as required to maintain a safe work environment meeting applicable regulatory requirements.
- .3 Ensure that hazardous, noxious, or volatile substances do not migrate to Owner occupied spaces.
- .4 Continue operation of ventilation and exhaust system for time after cessation of work process to assure removal of harmful contaminants.
- .5 Ventilate temporary sanitary facilities.

.3 Do not use permanent building heating and ventilation systems during construction.

.4 New permanent building heating and ventilation systems may be used during construction, at Contractor's option. Strictly adhere to the following if used during construction:

- .1 Obtain Owner's and Consultant's written permission for operation.
- .2 Owner will pay utility costs resulting from the use of permanent systems.
- .3 Operate systems in a non-wasteful and energy efficient manner. Be responsible for any system damage.
- .4 Provide proper care, attention and maintenance for equipment while it is being used. If, in opinion of Consultant, sufficient care and maintenance is not being

given to equipment and systems, Consultant reserves right to forbid further use of said equipment and systems.

.5 Just prior to Ready-for-Takeover, replace filters and perform other required maintenance to ensure systems are in as near as new condition as possible to entire satisfaction of the Owner and Consultant.

.6 Ensure that systems manufacturers' warranties do not commence until the date of Ready-for-Takeover or, if manufacturers' warranties do commence earlier when systems are put into use, arrange for necessary extension of manufacturers' warranties or provide equivalent coverage under Contractor's warranty.

.5 Maintain strict supervision of operation of temporary heating and ventilating equipment to:

.1 Conform with applicable codes and standards.

.2 Enforce safe practices.

.3 Prevent abuse of services.

.4 Prevent damage to finishes.

.5 Vent direct-fired combustion units to outside.

.6 Provide bi-monthly inspection for all air filters. Clean and/or replace filters depending on filter type during period in which ventilation units are being used for temporary heat and/or commissioning of system. Contractor to be responsible for and pay all costs for air filter cleaning service. Filters to operate between pressure drops noted in filter manufacturer's catalogue.

.7 During temporary heating period, retain boiler manufacturer to perform following inspections:

.1 Boiler manufacturer to inspect boiler bi-monthly when boiler is being used for temporary heat. Forward report to Consultant after each inspection indicating condition and operation of boiler and recommend any maintenance and repairs, which should be carried out to ensure boiler is in first class operating condition.

.2 Boiler manufacturer to thoroughly inspect boiler four weeks prior to final acceptance of contract. Manufacturer to forward report to Consultant stating condition of boiler and listing any parts which require repair, replacement or cleaning, to place boiler in perfect first class operating condition.

.3 On completion of any repairs and cleaning, etc. boiler manufacturer to issue certificate to Consultant guaranteeing specified efficiency and first class condition of boiler.

.4 Pay all costs for boiler inspection service, repairs, cleaning and replacement parts, etc. recommended by boiler manufacturer.

.5 Provide proper chemical treatment under supervision of chemical treatment specialist for steam, condensate, and hot water heating systems. Refer to Section 23 25 00 HVAC Water Treatment

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

1.4 TEMPORARY ELECTRICAL POWER AND LIGHTING

.1 Connect to and use Owner's existing electrical supply for temporary use during construction. Usage at no cost to Contractor.

1.5 FIRE PROTECTION

.1 Provide and maintain temporary fire protection equipment during performance of Work required by insurance companies having jurisdiction and governing codes, regulations and bylaws.

.2 Burning rubbish and construction waste materials is not permitted on site.

Part 2 Products

2.1 NOT USED

.1 Not Used.

Part 3 Execution

3.1 NOT USED

.1 Not Used.

END OF SECTION

Part 1 General

1.1 CONTRUCTION FACILITIES - GENERAL

.1 Provide temporary construction facilities as necessary for performance of the Work and in compliance with applicable regulatory requirements.

.2 Maintain temporary construction facilities in good condition for the duration of the Work.

.3 Prepare site plan indicating proposed location and dimensions of area to be fenced and used by Contractor, number of trailers to be used, avenues of ingress/egress to fenced area and details of fence installation.

.4 Identify areas which have to be gravelled to prevent tracking of mud.

.5 Indicate use of supplemental or other staging area.

.6 Remove temporary construction facilities from Place of the Work when no longer required.

1.2 PROTECTION AND MAINTENANCE OF TRAFFIC

.1 Provide access and temporary relocated roads as necessary to maintain traffic.

.2 Maintain and protect traffic on affected roads during construction period.

.3 Provide measures for protection and diversion of traffic, including provision of watch-persons and flag-persons, erection of barricades, placing of lights around and in front of equipment and work, and erection and maintenance of adequate warning, danger, and direction signs

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

.5 Contractor's traffic on roads selected for hauling material to and from site to interfere as little as possible with public traffic.

.6 Verify adequacy of existing roads and allowable load limit on these roads. Contractor: responsible for repair of damage to roads caused by construction operations.

.7 Construct access and haul roads necessary.

.8 Haul roads: constructed with suitable grades and widths; sharp curves, blind corners, and dangerous cross traffic shall be avoided.

.9 Provide necessary lighting, signs, barricades, and distinctive markings for safe movement of traffic.

.10 Dust control: adequate to ensure safe operation at all times.

.11 Lighting: to assure full and clear visibility for full width of haul road and work areas during night work operations.

.12 Provide snow removal during period of Work.

.13 Remove, upon completion of work, haul roads.

1.3 EQUIPMENT, TOOL AND MATERIALS STORAGE

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

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

1.4 SITE STORAGE/LOADING

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

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

Part 2 Products

2.1 NOT USED

.1 Not Used.

Part 3 Execution

3.1 NOT USED

.1 Not Used.

END OF SECTION

Part 1 General

1.1 BARRIERS AND ENCLOSURES – GENERAL

.1 Provide temporary barriers and enclosures necessary to protect the public and to secure Place of the Work during performance of the Work.

.2 Comply with applicable regulatory requirements.

.3 Maintain temporary barriers and enclosures in good condition for the duration of the Work.

.4 Remove temporary barriers and enclosures from Place of the Work when no longer required.

1.2 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 or as indicated.

1.3 EXTERIOR HOARDING

.1 Erect temporary exterior site hoarding to comply with applicable regulatory requirements.

.2 Use lumber framing and, minimum 13 mm thick exterior grade plywood.

.3 Paint public side of hoarding with one coat primer and one coat exterior paint. Maintain public side of hoarding clean and in good repair until removed.

.4 Provide lockable access gates for Construction Equipment and lockable pedestrian doors as required to facilitate construction access.

.5 Erect and maintain pedestrian walkways including roof and side covers, complete with pedestrian signage and electrical lighting.

.6 Provide barriers around trees and plants designated to remain. Protect from damage by equipment and construction procedures.

.7 Provide lockable truck entrance gates and at least one pedestrian door as directed and conforming to applicable traffic restrictions on adjacent streets. Equip gates with locks and keys.

1.4 WEATHER ENCLOSURES

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

.2 Provide weather enclosures to protect floor areas where walls are not finished and to enclose work areas that require temporary heating.

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

1.5 DUST TIGHT SCREENS

.1 Provide dust tight polyethylene screens to localize interior building areas from dust and noise generating activities.

.2 Erect, maintain, and relocate screens as required to facilitate construction operations and Owner's operational requirements.

1.6 ACCESS TO SITE

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

1.7 FIRE ROUTES

.1 Maintain fire access routes, including overhead clearances, for use by emergency response vehicles.

1.8 PROTECTION FOR OFF-SITE AND PUBLIC PROPERTY

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

.2 Be responsible for damage incurred.

1.9 PROTECTION OF BUILDING FINISHES

.1 Provide necessary temporary barriers and enclosures (screens, covers, hoardings, etc.) to protect existing and completed or partially completed finished surfaces from damage during performance of the Work.

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

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

Part 2 Products

2.1 NOT USED

.1 Not Used.

Part 3 Execution

3.1 NOT USED

.1 Not Used.

END OF SECTION

Part 1 General

1.1 GENERAL

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

.2 Store volatile wastes in covered metal containers and remove from premises daily.

.3 Prevent accumulation of wastes which create hazardous conditions.

.4 Provide adequate ventilation during use of volatile or noxious substances.

1.2 MATERIALS

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

1.3 CLEANING DURING CONSTRUCTION

.1 Maintain Owner's grounds, and public properties free from accumulations of construction waste materials and rubbish.

.2 Provide trash receptacles where work is being done, for storing trash and construction debris. Construction debris shall be removed from the premises in accordance with job progress.

.3 Dispose of waste materials, and rubbish at designated areas, or at authorized public refuse grounds.

.4 Vacuum clean interior building areas when ready to receive finish painting, and continue vacuum cleaning on an as-needed basis until building is ready for substantial completion or occupancy.

.5 Schedule cleaning operations so that dust and other contaminants resulting from cleaning process will not fall on wet, newly painted surfaces.

.6 Contain all work that generates dust and contamination. Protect Owner's work areas to eliminate any cross contamination.

Part 2 Products

2.1 NOT USED

.1 Not Used.

Part 3 Execution

3.1 NOT USED

.1 Not Used.

END OF SECTION

Part 1 General

1.1 GENERAL

.1 Materials and equipment specified and acceptable manufacturers are named in this specification for the purpose of establishing the standard of materials and workmanship to which Contractor shall adhere. Base tender price on the use of materials and equipment as specified.

.2 Provide Products, equipment, and materials that are new, not damaged or defective, and suitable for purpose intended, subject to specified requirements. If requested by Consultant, furnish evidence as to type, source and quality of Products provided.

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

.4 Defective products, whenever identified prior to completion of Work, will be rejected, regardless of previous observations. Observation 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. Should disputes arise as to quality or fitness of products, decision rests strictly with Consultant based upon requirements of Contract Documents.

.5 Unless otherwise specified, maintain uniformity of manufacture for like items throughout. Materials of same general type to be of same manufacture (e.g. all air supply units shall be of same manufacturer). Ensure all sub-trades provide products of same manufacturer.

.6 Follow manufacturer's recommendations for safety, adequate access for inspection, maintenance and repairs of individual equipment installed.

.7 Permit equipment maintenance and disassembly with minimum disturbance to connecting piping and duct systems and without interference with building structure or other equipment.

.8 Provide accessible lubricating means for bearings, including permanent lubricated 'Lifetime' bearings.

.9 Equipment and materials shown on drawings and not specified herein, or specified herein and not shown on drawings, shall be included in this contract as though both shown and specified.

.10 Permanent manufacturer’s markings, labels, trademarks, and nameplates on Products are not acceptable in prominent locations, except where required by regulatory requirements or for operating instructions, or when located in mechanical or electrical rooms.

.11 Contractor may propose alternate for any specified item which Contractor considers “equal” to that specified. Refer to Section 01 25 00 Substitution Procedures for proposing alternates during procurement.

.1 All alternate items submitted for consideration must not exceed available space limitations.

.2 All additional costs for mechanical, electrical, structural and/or architectural revisions required to incorporate materials and equipment substituted by Contractor shall be responsibility of Contractor.

.3 Equipment listed as “equal” in specifications or submitted as alternate by Contractor must meet all space requirements, specified capacities and must have equipment characteristics of specified equipment as interpreted by Consultant. Install equipment in strict accordance with manufacturer's published recommendations.

1.2 PRODUCT OPTIONS

.1 Subject to the provisions of Section 01 25 00 –Substitution Procedures:

.1 Wherever a Product or manufacturer is specified by a single proprietary name, provide the named Product only.

.2 Wherever more than one Product or manufacturer is specified by proprietary name for a single application, provide any one of the named Products.

.3 Wherever a Product is specified by reference to a standard only, provide any Product that meets or exceeds the specified standard. If requested by Consultant, submit information verifying that the proposed Product meets or exceeds the specified standard.

.4 Wherever a Product is specified by descriptive or performance requirements only, provide any Product that meets or exceeds the specified requirements. If requested by Consultant, submit information verifying that the proposed Product meets or exceeds the specified requirements.

1.3 PRODUCT AVAILABILITY AND DELIVERY TIMES

.1 Promptly upon Contract award and periodically during construction, review and confirm Product availability and delivery times. Order Products in sufficient time to meet the construction progress schedule and the Contract Time.

.2 If a specified Product is no longer available, promptly notify Consultant. Consultant will take action as required.

.3 If delivery delays are foreseeable, for any reason, promptly notify Consultant.

.4 If a delivery delay is beyond Contractor’s control, Consultant will provide direction.

.5 If a delivery delay is caused by something that was or is within Contractor’s control, Contractor shall propose actions to maintain the construction progress schedule for Consultant’s review and acceptance.

1.4 TRANSPORTATION

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

.2 Transportation cost of products supplied by Owner will be paid for by Owner unless otherwise specified. Unload, handle and store such products.

1.5 STORAGE, HANDLING, AND PROTECTION

.1 Store, handle, and protect Products during transportation to Place of the Work and before, during, and after installation in a manner to prevent damage, adulteration, deterioration and soiling.

.2 Comply with manufacturer's instructions for storage, handling and protection.

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

.4 Comply with the requirements of the workplace hazardous materials information system (WHMIS) regarding use, handling, storage, and disposal of hazardous materials, including requirements for labeling and the provision of material safety data sheets (MSDS).

.5 Store Products subject to damage from weather in weatherproof enclosures.

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

.7 Remove and replace damaged Products.

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

.9 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.

.10 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.

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

Part 2 Products

2.1 NOT USED

.1 Not Used.

Part 3 Execution

3.1 NOT USED

.1 Not Used.

END OF SECTION

Part 1 General

1.1 EXISTING UTILITIES AND STRUCTURES

.1 Before commencing excavation, drilling or other earthwork, establish or confirm location and extent of all existing underground utilities and structures in work area.

.2 Promptly notify Consultant if underground utilities, structures, or their locations differ from those indicated in Contract Documents or in available project information. Consultant will provide appropriate direction.

.3 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.

.4 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.

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

.6 Remove abandoned service lines within 2 m of structures. Cap or otherwise seal lines at cut-off points as directed by Consultant.

.7 Where the Work involves breaking into or connecting to existing services, give authority having jurisdiction 48 hours notice for necessary interruption of mechanical or electrical services.

.8 Maintain excavations free of water.

.9 Keep duration of interruptions to a minimum.

.10 Carry out interruptions after regular working hours of occupants, preferably on weekends, unless Owner’s prior written approval is obtained.

.11 Protect and maintain existing active services. Record location of services, including depth, on as-built drawings. Construct or erect barriers in accordance with Section 01 56 00 - Temporary Barriers and Enclosures as required to protect pedestrian and vehicular traffic.

1.2 VERIFICATION OF EXISTING CONDITIONS

.1 Examine site, existing adjacent buildings and local conditions affecting work under this contract. Examine Structural, Architectural, Mechanical and Electrical and all other Contract drawings to ensure work can be performed without changes to the building as shown on plans. No allowance will be made later for necessary changes, unless notification of interferences have been brought to Consultant's attention, in writing, prior to closing of tenders.

.2 Where work specified in any Section is dependent on the work of another Section or Sections having been properly completed, verify that work is complete and in a condition suitable to receive the subsequent work. Commencement of work of a Section that is

dependent on the work of another Section or Sections having been properly completed, means acceptance of the existing conditions.

.3 Verify that ambient conditions are suitable before commencing the work of any Section and will remain suitable for as long as required for proper setting, curing, or drying of Products used.

.4 Ensure that substrate surfaces are clean, dimensionally stable, cured and free of contaminants.

.5 Notify Consultant in writing of unacceptable conditions.

1.3 SUBSURFACE CONDITIONS

.1 Promptly notify Consultant in writing if subsurface conditions at Place of Work differ materially from those indicated in Contract Documents, or a reasonable assumption of probable conditions based thereon.

.2 After prompt investigation, should Consultant determine that conditions do differ materially, instructions will be issued for changes in Work as provided in Changes and Change Orders.

Part 2 Products

2.1 NOT USED

.1 Not Used.

Part 3 Execution

3.1 NOT USED

.1 Not Used.

END OF SECTION

Part 1 General

1.1 SUMMARY

.1 Except where otherwise specified in technical Specifications or otherwise indicated on drawings, comply with requirements of this Section.

1.2 MANUFACTURER'S INSTRUCTIONS

.1 Install, erect, or apply Products in strict accordance with manufacturer's instructions.

.2 Notify Consultant, in writing, of conflicts between Contract Documents and manufacturer's instructions where, in Contractor's opinion, conformance with Contract Documents instead of the manufacturer's instructions may be detrimental to the Work or may jeopardize the manufacturer's warranty.

.3 Do not rely on labels or enclosures provided with Products. Obtain written instructions directly from manufacturers.

.4 Provide manufacturer's representatives with access to the Work at all times. Render assistance and facilities for such access so that manufacturer's representatives may properly perform their responsibilities.

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

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

1.3 CO-ORDINATION

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

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

1.4 CONCEALMENT

.1 Conceal pipes, ducts, and wiring in floors, walls and ceilings in finished areas:

- .1 after review by Consultant and authority having jurisdiction, and
- .2 where locations differ from those shown on Drawings, after recording actual locations on as-built drawings.

.2 Provide incidental furring or other enclosures as required.

.3 Notify Consultant in writing of interferences before installation.

1.5 FASTENINGS – GENERAL

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

.2 Prevent electrolytic action and corrosion between dissimilar metals and materials by using suitable non-metallic strips, washers, sleeves, or other permanent separators to avoid direct contact.

.3 Use non-corrosive fasteners and anchors for securing exterior work and in spaces where high humidity levels are anticipated.

.4 Space anchors within individual load limit or shear capacity and ensure they provide positive permanent anchorage.

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

.6 Do not use fastenings or fastening methods that may cause spalling or cracking of material to which anchorage is made.

1.6 FASTENINGS – EQUIPMENT

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

.2 Bolts shall not project more than one diameter beyond nuts.

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

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

1.7 FIRE RATED ASSEMBLIES

.1 When penetrating fire rated walls, ceiling, or floor assemblies, completely seal voids with fire-stopping materials, smoke seals, or both, in full thickness of the construction element as required to maintain the integrity of the fire rated assembly.

1.8 LOCATION OF EQUIPMENT, FIXTURES, OUTLETS AND DEVICES

.1 Consider location of equipment, fixtures, outlets, and devices indicated on Drawings as approximate.

.2 Locate equipment, fixtures, outlets, and devices to provide minimum interference, maximum usable space, and as required to meet safety, access, maintenance, acoustic, and regulatory, including barrier free, requirements.

.3 Promptly notify Consultant in writing of conflicting installation requirements for fixtures, outlets, and devices. If requested, indicate proposed locations and obtain approval for actual locations.

.4 Submit field drawings to indicate relative position of various services and equipment when required by consultant.

1.9 ACCESSIBILITY OF EQUIPMENT

.1 All equipment must be accessible, as defined as follows: Ceiling mounted equipment shall only be considered accessible if a tradesman can place both hands on the component which requires servicing (i.e. fan motor, belt, pulley, bearings, fire damper linkage, valve/control valve, strainer cleanouts or any other equipment component which requires periodic maintenance).

.2 The component must be in clear view, and accessible from an 8 or 10 foot step ladder. Place, size, and provide access panels in drywall in such a manner that a tradesman can place two hands on the component as stated above.

.3 Coordinate attendance at an early construction meeting with general contractor, affected subtrades, Owner's representative, and Consultant to review ceiling space coordination protocols.

.4 Position equipment located above acoustic tile ceilings in such a manner that equipment and components can be accessed through a full tile which does not contain any devices, such as light fixtures, speakers, smoke detectors or sprinkler heads. Review with the Owner's representative and Consultant if this is not possible.

.5 Locate all serviceable mechanical equipment within 900mm of the finished ceiling.

.6 Relocate conduit, pipe, ducting and support members, or any other obstructions to accessibility at the contractor's expense, by the contractor's forces.

.7 General layering of equipment and services:

.1 Route conduits tight to underside of structure in most cases. Offset up to underside of structure to accommodate mechanical systems and equipment.

.2 Coordinate locations and layout of mechanical services and equipment to avoid covering electrical junction and pull boxes, etc.

1.10 PROTECTION OF COMPLETED WORK AND WORK IN PROGRESS

.1 Adequately protect parts of the Work completed and in progress from any kind of damage.

.2 Promptly remove, replace, clean, or repair, as directed by Consultant, work damaged as a result of inadequate protection.

.3 Do not load or permit to be loaded any part of the Work with a weight or force that will endanger the safety or integrity of the Work.

.4 Do not cut, drill or sleeve load bearing structural member, unless specifically indicated without written approval of Consultant.

1.11 REMEDIAL WORK

.1 Notify Consultant of, and perform remedial work required to, repair or replace defective or unacceptable work. Ensure that properly qualified workers perform remedial work. Coordinate adjacent affected work as required.

Part 2 Products

2.1 NOT USED

.1 Not Used.

Part 3 Execution

3.1 NOT USED

.1 Not Used.

END OF SECTION

Part 1 General

1.1 REQUEST FOR CUTTING, PATCHING AND REMEDIAL WORK

.1 Cutting, patching and repairs to existing surfaces may be required as a result of the removal and/or relocation of existing equipment and piping, and/or installation of new equipment and piping in existing building(s). Employ and pay appropriate sub-trade whose work is involved, for carrying out work described above

.2 Submit written request in advance of cutting, coring, or alteration which affects or is likely to affect:

- .1 Structural integrity of any element of the Work.
- .2 Integrity of weather-exposed or moisture-resistant elements.
- .3 Efficiency, maintenance, or safety of any operational element.
- .4 Visual qualities of sight-exposed elements.
- .5 Work of Owner or other contractors.
- .6 Warranty of Products affected.

.3 Include in request:

- .1 Identification of Project.
- .2 Location and description of affected work, including drawings or sketches as required.
- .3 Statement on necessity for cutting or alteration.
- .4 Description of proposed work, and Products to be used.
- .5 Alternatives to cutting and patching.
- .6 Effect on work of Owner or other contractors.
- .7 Written permission of affected other contractors.
- .8 Date and time work will be executed.

1.2 PRODUCTS

.1 Unless otherwise specified, when replacing existing or previously installed Products in the course of cutting and patching work, use replacement Products of the same character and quality as those being replaced.

.2 If an existing or previously installed Product must be replaced with a different Product, submit request for substitution in accordance with Section 01 25 00 - Substitution Procedures.

1.3 PREPARATION

.1 Inspect existing conditions in accordance with Section 01 71 00 - Examination and Preparation, including elements subject to damage or movement during cutting and patching.

.2 Coordinate with mechanical, electrical, and structural divisions to mark out required openings.

.3 Where services are concealed within walls, floors or ceilings and cannot be visually identified, provide electronic scanning devices or other approved means to locate and identify concealed services prior to drilling.

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

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

.6 Provide supports to ensure structural integrity of surroundings; provide devices and methods to protect other portions of the Work from damage.

.7 Provide protection from elements for areas that may be exposed by uncovering work.

1.4 CUTTING, PATCHING, AND REMEDIAL WORK

.1 Coordinate and perform the Work to ensure that cutting and patching work is kept to a minimum.

.2 Perform cutting, fitting, patching, and remedial work to make the affected parts of the Work come together properly and complete the Work.

.3 Provide openings in non-structural elements of the Work for penetrations of mechanical and electrical work.

.4 Perform cutting by methods to avoid damage to other work.

.5 Provide proper surfaces to receive patching, remedial work, and finishing.

.6 Perform cutting, patching, and remedial work using competent and qualified specialists familiar with the Products affected, in a manner that neither damages nor endangers the Work.

.7 Do not use pneumatic or impact tools without Consultant’s prior approval.

.8 Ensure that cutting, patching, and remedial work does not jeopardize manufacturers’ warranties.

.9 Refinish surfaces to match adjacent finishes. For continuous surfaces refinish to nearest intersection. For an assembly, refinish entire unit.

.10 Fit work to pipes, sleeves, ducts, conduit, and other penetrations through surfaces with suitable allowance for deflection, expansion, contraction, acoustic isolation, and firestopping.

.11 Maintain fire ratings of fire rated assemblies where cutting, patching, or remedial work is performed. Completely seal voids or penetrations of assembly with firestopping material to full depth or with suitably rated devices.

.12 Uncover Work to install ill-timed Work.

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

1.5 HOLES IN PRECAST CONCRETE

.1 Holes in pre-cast concrete will only be permitted at points marked on drawings and/or as permitted by Structural Consultant. Mechanical and electrical trades to mark the locations and size of all holes they require to Structural Engineer's approval.

.2 Provide reinforcing of holes as required by Structural consultant.

Part 2 Products

2.1 NOT USED

.1 Not Used.

Part 3 Execution

3.1 NOT USED

.1 Not Used.

END OF SECTION

Part 1 General

1.1 REGULATORY REQUIREMENTS

.1 Comply with applicable regulatory requirements when disposing of waste materials.

.2 Obtain permits from authorities having jurisdiction and pay disposal fees where required for disposal of waste materials and recyclables.

1.2 GENERAL CLEANING REQUIREMENTS

.1 Provide adequate ventilation during use of volatile or noxious substances. Do not rely on building ventilation systems for this purpose.

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

.3 Prevent cross-contamination during the cleaning process.

.4 Notify the Consultant of the need for cleaning caused by Owner or other contractors.

1.3 PROGRESSIVE CLEANING AND WASTE MANAGEMENT

.1 Maintain the Work in a tidy and safe condition, free from accumulation of waste materials and construction debris.

.2 Provide appropriate, clearly marked, containers for collection of waste materials and recyclables. Locate containers where indicated on Drawings.

.3 Remove waste materials and recyclables from work areas, separate, and deposit in designated containers at end of each Working Day. Collect packaging materials for recycling or reuse.

.4 Remove waste materials and recyclables from Place of the Work at intervals as scheduled in Construction Progress Schedule.

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

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

.7 Clean dirt or mud tracked onto paved or surfaced roadways.

.8 Clear snow and ice from public sidewalks as required to comply with applicable municipal regulatory requirements.

.9 Store materials resulting from demolition activities that are salvageable.

.10 Stack stored new or salvaged material not in construction facilities.

1.4 FINAL CLEANING

.1 Before final cleaning, arrange a meeting at Place of the Work to determine the acceptable standard of cleaning. Ensure that Owner, Consultant, Contractor, and cleaning company are in attendance.

.2 Remove from Place of the Work surplus Products, waste materials, recyclables, Temporary Work, and Construction Equipment not required to perform any remaining work.

.3 Provide professional cleaning by a qualified, established cleaning company.

.4 Lock or otherwise restrict access to each room or area after completing final cleaning in that area.

.5 Re-clean as necessary areas that have been accessed by Contractor's workers prior to Owner occupancy.

.6 Remove stains, spots, marks, and dirt from finished surfaces, electrical and mechanical fixtures, furniture fitments, walls, and floors.

.7 Clean and polish glass, mirrors, hardware, wall tile, stainless steel, chrome, porcelain enamel, baked enamel, plastic laminate, and all other finished surfaces, including mechanical and electrical fixtures. Replace broken, scratched or otherwise damaged glass.

.8 Remove dust from lighting reflectors, lenses, lamps, bulbs, and other lighting surfaces.

.9 Vacuum clean and dust exposed wall, floor, and ceiling surfaces, behind grilles, louvres and screens, above suspended ceiling tiles.

.10 Clean mechanical, electrical, and other equipment. Replace filters for mechanical equipment if equipment is used during construction.

.11 Remove waste material and debris from crawlspaces and other accessible concealed spaces.

.12 Wax, seal, shampoo or prepare floor finishes, as recommended by manufacturer.

.13 Inspect finishes, fitments and equipment and ensure specified workmanship and operation.

.14 Remove stains, spots, marks, and dirt from exterior facades.

.15 Clean exterior and interior window glass and frames.

.16 Clean and clear roofs, downspouts, gutters, areaways, sunken wells.

.17 Sweep clean, power wash, and remove snow and ice from exterior sidewalks, steps, driveways, roads, parking lots, and other paved surfaces.

.18 Use leaf blowers to clean landscaped surfaces.

1.5 WASTE MANAGEMENT AND DISPOSAL

.1 Dispose of waste materials and recyclables at appropriate municipal landfills and recycling facilities in accordance with applicable regulatory requirements.

.2 Do not burn or bury waste materials at Place of the Work.

.3 Do not dispose of volatile and other liquid waste such as mineral spirits, oil, paints and other coating materials, paint thinners, cleaners, and similar materials together with dry waste materials or on the ground, in waterways, or in storm or sanitary sewers. Collect such waste materials in appropriate covered containers, promptly remove from Place of the Work, and dispose of at recycling facilities or as otherwise permitted by applicable regulatory requirements.

.4 Cover or wet down dry waste materials to prevent blowing dust and debris.

Part 2 Products

2.1 NOT USED

.1 Not Used.

Part 3 Execution

3.1 NOT USED

.1 Not Used.

END OF SECTION

Part 1 General

1.1 READY-FOR-TAKEOVER

.1 The prerequisites to attaining Ready-for-Takeover of the Work are described in the General Conditions of the Contract.

1.2 INSPECTION AND REVIEW BEFORE READY-FOR-TAKEOVER

.1 Contractor's Inspection: Before applying for the Consultant's review to establish Ready-for-Takeover of the Work:

.1 Ensure that the specified prerequisites to Ready-for-Takeover of the Work are completed.

.2 Conduct an inspection of the Work to identify defective, deficient, or incomplete work.

.2 Prepare a comprehensive and detailed list of items to be completed or corrected.

.3 Provide an anticipated schedule and costs for items to be completed or corrected.

.1 Consultant's Review: Upon receipt of the Contractor's application for review, together with the Contractor's list of items to be completed or corrected, the Consultant will review the Work. The Consultant will advise the Contractor whether or not the Work is Ready-for-Takeover and will provide the Contractor with a list of items, if any, to be added to the Contractor's list of items to be completed or corrected. Provide the Consultant with a copy of the Contractor's revised list.

.2 Consultant's Review: Upon receipt of the Contractor's application for review, together with the Contractor's list of items to be completed or corrected, the Consultant and the Contractor shall arrange a mutually satisfactory agreed date and time to jointly review the Work. The Consultant will advise the Contractor whether or not the Work is Ready-for- Takeover. Add additional items, if any, to the Contractor's list of items to be completed or corrected. Provide the Consultant with a copy of the revised list.

.3 Maintain the list of items to be completed or corrected and promptly correct or complete defective, deficient and incomplete work. The Contractor's inspection and Consultant's review procedures specified above shall be repeated until the Work is Ready-for-Takeover and no items remain on the Contractor's list of items to be completed or corrected.

.4 When the Consultant determines that the Work is Ready-for-Takeover, the Consultant will notify the Contractor and the Owner in writing to that effect.

.4 Commencement of Warranty Period: date of Ready-for-Takeover shall be date for commencement for warranty period.

1.3 PREREQUISITES TO FINAL PAYMENT

.1 After Ready-for-Takeover of the Work and before submitting an application for final payment in accordance with the General Conditions of Contract:

.1 Correct or complete all remaining defective, deficient, and incomplete work.

.2 Remove from the Place of the Work all remaining surplus Products, Construction Equipment, and Temporary Work.

.3 Perform final cleaning and waste removal necessitated by the Contractor's work performed after Ready-for-Takeover, as specified in Section 01 74 00 – Cleaning and Waste Management.

.2 Submit written report certifying the above items have been completed.

.3 Final Observation: when items noted above are completed, request final Observation of Work by Consultant and Contractor. If Work is deemed incomplete, complete outstanding items and request re-observation.

.4 Final Payment: when Consultant considers final deficiencies and defects have been corrected and it appears requirements of Contract have been totally performed, make application for final payment. Refer to CCDC 2.

1.4 SUBSTANTIAL PERFORMANCE OF THE WORK

.1 The prerequisites to, and the procedures for, attaining substantial performance of the Work, or similar such milestone as provided for in the lien legislation applicable to the Place of the Work, shall be:

.1 independent of those for attaining Ready-for-Takeover of the Work, and

.2 in accordance with the lien legislation applicable to the Place of the Work.

.2 Declaration of Substantial Performance: when Consultant considers deficiencies and defects have been corrected and it appears requirements of Contract have been substantially performed, make application for certificate of Substantial Performance. Refer to CCDC 2 for specifics to application.

.3 Commencement of Lien Period: date of Owner's acceptance of submitted declaration of Substantial Performance shall be date for commencement of lien period unless required otherwise by lien statute of Place of Work.

.4 Payment of Holdback: after issuance of certificate of Substantial Performance of Work, submit an application for payment of holdback amount in accordance with CCDC 2.

Part 2 Products

2.1 NOT USED

.1 Not Used.

Part 3 Execution

3.1 NOT USED

.1 Not Used.

END OF SECTION

Part 1 General

1.1 OPERATION AND MAINTENANCE MANUAL

.1 Prepare a comprehensive operation and maintenance manual, in the language(s) of the Contract, using personnel qualified and experienced for this task.

.2 Submit an initial draft of the operation and maintenance manual for Consultant's review. If required by Consultant's review comments, revise manual contents and resubmit for Consultant's review. If required, repeat this process until Consultant accepts the draft manual in writing.

.3 Submit final version to Owner in electronic PDF copy format.

1.2 OPERATION AND MAINTENANCE MANUAL FORMAT

.1 Organize data in the form of an instructional manual.

.2 Binders: vinyl, hard covered, three D-rings, loose leaf, 216 x 279 mm, with spine and face pockets.

.3 When multiple binders are used, correlate data into related consistent groupings. Identify contents of each binder on spine.

.4 Cover: Identify each binder with typed or printed title "Operation and Maintenance Manual", name of Project or facility, and subject matter of contents.

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

.6 Provide tabbed fly leaf for each separate Product or system, with typed description of Product and major component parts of equipment.

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

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

.9 Provide electronic copy of manual in PDF format.

.10 Include electronic copy of Shop Drawings as part of Operation and Maintenance manuals.

1.3 OPERATION AND MAINTENANCE MANUAL – GENERAL CONTENT

.1 Table of contents for each volume.

.2 Introductory information including:

- .1 Title of project.
- .2 Date of manual submission.
- .3 Complete contact information for Consultant, subconsultants, other consultants, and Contractor, with names of responsible parties.

.4 Schedule of Products and systems indexed to content of volume.

.3 For each Product or system, include complete contact information for Subcontractors, Suppliers and manufacturers, including local sources for supplies and replacement parts.

.4 Product Data: mark each sheet to clearly identify specific products, options, and component parts, and data applicable to installation. Delete or strike out inapplicable information. Supplement with additional information as required.

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

.6 Typewritten Text: as required to supplement product data. Provide logical sequence of instructions for each procedure, incorporating manufacturer's instructions.

.7 Reviewed Shop Drawings.

.8 Permits, certificates, letters of assurance and other relevant documents issued by or required by authorities having jurisdiction.

.9 Warranties.

.10 Operating and maintenance procedures, incorporating manufacturer's operating and maintenance instructions, in a logical sequence.

.11 Training materials as specified in Section 01 79 00 - Demonstration and Training.

1.4 OPERATION AND MAINTENANCE MANUAL - EQUIPMENT AND SYSTEMS CONTENT

.1 Each Item of Equipment and Each System: include description of unit or system and component parts. Give function, normal operation characteristics, and limiting conditions. Include performance curves, with engineering data and tests, and complete nomenclature and commercial number of replaceable parts.

.2 Panel Board Circuit Directories: provide electrical service characteristics, controls, and communications.

.3 Include installed colour coded wiring diagrams.

.4 Operating Procedures: include start-up, break-in, and routine normal operating instructions and sequences. Include regulation, control, stopping, shut-down, and emergency instructions. Include summer, winter, and any special operating instructions.

.5 Maintenance Requirements: include routine procedures and guide for trouble-shooting; disassembly, repair, and reassembly instructions; and alignment, adjusting, balancing, and checking instructions.

.6 Provide servicing and lubrication schedule, and list of lubricants required.

.7 Include manufacturer's printed operation and maintenance instructions.

.8 Include sequence of operation by controls manufacturer.

.9 Provide original manufacturer's parts list, illustrations, assembly drawings, and diagrams required for maintenance.

.10 Provide installed control diagrams by controls manufacturer.

.11 Provide Contractor's coordination drawings, with installed colour coded piping diagrams.

.12 Provide charts of valve tag numbers, with location and function of each valve, keyed to flow and control diagrams.

.13 Provide list of original manufacturer's spare parts, current prices, and recommended quantities to be maintained in storage.

.14 Include testing and balancing reports.

.15 Include additional content as specified in technical Specifications sections.

1.5 OPERATION AND MAINTENANCE MANUAL - PRODUCTS AND FINISHES CONTENT

.1 Include Product data, with catalogue number, options selected, size, composition, and colour and texture designations. Provide information for re-ordering custom manufactured Products.

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

.3 Include an outline of requirements for routine and special inspections and for regular maintenance to ensure that on-going performance of the building envelope, moisture, and weather exposed products will meet the initial criteria for those elements.

.4 Include additional content as specified in technical Specifications sections.

1.6 AS-BUILTS AND SAMPLES

.1 Maintain, in addition to requirements in General Conditions, at site for Consultant and Owner one record copy of:

- .1 Contract Drawings.
- .2 Specifications.
- .3 Addenda.
- .4 Change Orders and other modifications to Contract.
- .5 Reviewed shop drawings, product data, and samples. Field test records.
- .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 observation by Consultant.

1.7 RECORDING ACTUAL SITE CONDITIONS

.1 Site records:

.1 Mark changes on one set of reproducible drawings as work progresses and as changes occur. Provide sets of white prints as required for each phase of work.

.2 Transfer information daily to reproducible drawings, revising to show work as actually installed.

.3 Use different colour ink for each service and system.

.4 Make available on site for reference purposes and inspection.

.2 Record Documentation:

.1 Record information on set of black line within copy of Project Manual.

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

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

.3 Contract Drawings and shop drawings: mark each item to record actual construction, including:

.1 Measured depths of elements of foundation in relation to finish first floor datum.

.2 Measured horizontal and vertical locations of underground utilities and appurtenances, referenced to permanent surface improvements.

.3 Measured locations of internal utilities and appurtenances, referenced to visible and accessible features of construction.

.4 Field changes of dimension and detail.

.5 Changes made by change orders.

.6 Details not on original Contract Drawings.

.7 Changes resulting from adjustments made during Commissioning operations.

.4 Specifications: mark each item to record actual construction, including:

.1 Manufacturer, trade name, and catalogue number of each product actually installed, particularly optional items and substitute items.

.2 Changes made by Addenda and change orders.

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

.6 As–built drawings:

.1 Provide as built drawings for entire installation, including new construction, demolition, schematics, details, and schedules drawings.

.2 Facility Management place high priority on accurate as-built information of mechanical services, as it is essential to have full knowledge of valve and service locations.

.3 Accuracy: to within 1 meter of actual location. Correct any deviations found upon review of the as-built information with no additional cost to the owner.

.4 Identify each drawing in lower right–hand corner in letters at least 12 mm high as follows:
"(Contractor Name/Logo)
AS BUILT DRAWINGS: THIS DRAWING HAS BEEN REVISED TO SHOW [INSERT SYSTEM TYPE] SYSTEMS AS INSTALLED.
(Signature of Contractor) (Date)"

.5 Provide owner with three hard copies of complete set as–built drawings on 20 lbs bond paper of each system for record purposes. Size and scale of drawings to match original documents prepared by Consultant.

.6 Submit electronic copy of as–built drawings on one USB containing:

.1 AutoCAD (.dwg)

.2 PDF

1.8 SPARE PARTS, MAINTENANCE MATERIALS, AND SPECIAL TOOLS

.1 Supply spare parts, maintenance materials, and special tools in quantities specified in technical Specifications sections.

.2 Ensure spare parts and maintenance materials are new, not damaged nor defective, and of same quality, manufacturer, and batch or production run as installed Products.

.3 Provide tags for special tools identifying their function and associated Product.

.4 Deliver to and store items at location directed by Owner at Place of the Work. Store in original packaging with manufacturer's labels intact and in a manner to prevent damage or deterioration.

.5 Catalogue all items and submit to Consultant an inventory listing organized by Specifications section. Include Consultant reviewed inventory listing in operation and maintenance manual.

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

1.9 WARRANTIES

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

.2 Submit warranty management plan, 30 days before planned pre-warranty conference, to Consultant for approval.

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

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

.5 Submit, warranty information made available during construction phase, to Consultant for approval prior to each monthly pay estimate.

.6 Assemble approved information for inclusion in operation and maintenance manual and submit upon acceptance of work. Organize as follows:

.1 Separate each warranty 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, executed in duplicate by subcontractors, suppliers, and manufacturers, within ten days after completion of applicable item of work.

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

.5 Co-execute submittals when required.

.6 Retain warranties until time specified for submittal.

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

.8 Conduct 11-month warranty inspection, measured from time of acceptance, by Consultant.

.9 Include information contained in warranty management plan as follows:

.1 Roles and responsibilities of personnel associated with warranty process, including points of contact and telephone numbers within the organizations of Contractors, subcontractors, manufacturers or suppliers involved.

.2 Listing and status of delivery of Certificates of Warranty for extended warranty items.

.3 Provide list for each warranted equipment, item, feature of construction or system indicating:

.1 Name of item.

.2 Model and serial numbers.

.3 Location where installed.

.4 Name and phone numbers of manufacturers or suppliers.

.5 Names, addresses and telephone numbers of sources of spare parts.

.6 Warranties and terms of warranty: include one-year overall warranty of construction. Indicate items that have extended warranties and show separate warranty expiration dates.

.7 Cross-reference to warranty certificates as applicable.

.8 Starting point and duration of warranty period.

.9 Summary of maintenance procedures required to continue warranty in force.

.10 Cross-Reference to specific pertinent Operation and Maintenance manuals.

.11 Organization, names and phone numbers of persons to call for warranty service.

.12 Typical response time and repair time expected for various warranted equipment.

.4 Procedure and status of tagging of equipment covered by extended warranties.

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

.11 Written verification will follow oral instructions. Failure to respond will be cause for the Consultant to proceed with action against Contractor.

1.10 PRE-WARRANTY CONFERENCE

.1 Meet with Consultant to develop understanding of requirements of this section. Schedule meeting prior to contract completion, and at time designated by Consultant.

.2 Consultant will establish communication procedures for:

.1 Notification of construction warranty defects.

.2 Determine priorities for type of defect.

.3 Determine reasonable time for response.

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

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

Part 2 Products

2.1 NOT USED

.1 Not Used.

Part 3 Execution

3.1 NOT USED

.1 Not Used.

END OF SECTION

Part 1 General

1.1 GENERAL

.1 All drawings and all sections of the specifications shall apply to and form an integral part of this section.

1.2 SCOPE OF WORK

.1 Work to include all labour, material and equipment required for installing, testing and placing in initial operation the following systems as detailed in specifications of each section and as shown on drawings.

- .1 Section 21 05 10 – Acceptable Equipment, Materials and Products - Mechanical.
- .2 Section 21 08 10 – Insulation.
- .3 Section 21 13 13 – Wet Pipe Sprinkler Systems
- .4 Section 23 60 10 – Liquid Heat Transfer

1.3 EXISTING CONDITIONS

.1 Examine site, existing adjacent buildings and local conditions affecting work under this contract. Examine Structural, Architectural, Mechanical and Electrical and all other Contract drawings to ensure work can be performed without changes to the building as shown on plans. No allowance will be made later for necessary changes, unless notification of interferences have been brought to Consultant's attention, in writing, prior to closing of tenders.

1.4 REGULATIONS

.1 Comply with, most stringent requirements of Manitoba Building Code, National Building Code and local regulations and by-laws, with specified standards and codes and this specification. Before any work is proceeded with, approved layouts to be filed with and approved by proper authorities.

.2 Provide necessary notices, obtain permits and pay all fees, in order that work specified may be carried out. Charges and alterations required by authorized inspector of any authority having jurisdiction, to be carried out without charge or expense to Owner. Pay all charges for service connections to municipal mains.

.3 Furnish certificates confirming work installed conforms to requirements of authorities having jurisdiction.

1.5 LIABILITY

.1 Install work in advance of concrete pouring or similar work. Provide and set pipe sleeves as required.

.2 Install concealed pipes and ducts neatly, close to building structure so furring is minimum size. Pipes, ducts and equipment installed improperly, to be removed and replaced without cost to Owners.

.3 Protect and maintain work until building has been completed and accepted. Protect work against damage during installation. Cover with tarpaulins if necessary. Repair all damage to floor and wall surfaces resulting from carrying out of work, without expense to Owners.

.4 During welding or soldering ensure structure is protected against fire by shielding, using fire-rated sheets and galvanized iron sheets. Contractor shall provide trained persons armed with suitable type extinguishers, with no other duties than to watch for and extinguish sparks, etc.

.5 Co-ordinate work with other sections to avoid conflict and to ensure proper installation of all equipment. Review all contract drawings.

.6 On completion of work, remove tools, surplus and waste material and leave work in clean, perfect condition.

1.6 GUARANTEE

.1 Guarantee satisfactory operation of all work and apparatus installed under this contract. Replace, at no expense to Owner, all items which fail or prove defective within a period of one year after final acceptance of complete contract by Owner, always provided such failure is not due to improper usage by Owner. Make good all damage to building incurred as a result of failure or repair of mechanical work.

.2 No certification given, payment made, partial or entire use of equipment by Owner, shall be construed as acceptance of defective work or acceptance of improper materials. Make good at once, without cost to the Owner all such defective work or materials and consequence resulting therefrom, within one year of final acceptance date.

.3 This general guarantee shall not act as a waiver for any specified guarantee and/or warranty of greater length of time noted elsewhere in these documents.

.4 Refrigeration compressor circuit connected to air-conditioning systems shall have manufacturer's warrantee period of four (4) years after initial one year guarantee.

1.7 ENGINEERING OBSERVATIONS

.1 The term "Consultant" in all mechanical sections of specification shall mean:

SMS Engineering Ltd.
770 Bradford Street
Winnipeg, Manitoba
R3H 0N3

.2 Contractor's work will be observed periodically, solely for purpose of determining general quality of work, and not for any other purpose. Guidance will be offered to Contractor in interpretation of plans and specifications to assist him to carry out work. Observations and directives given to Contractor does not relieve Contractor and his agents, servants and employees of their responsibility to erect and install work in all its parts in a safe and workmanlike manner, and in accordance with all relevant codes, standards, plans and specifications, nor does it impose upon Owner, and/or Consultant or their representatives, any responsibility to supervise or oversee erection or installation of any work.

.3 The Consultant is not responsible for inspection of the Contractor’s work. The Consultant maintains the right to observe the work at its sole discretion. In addition to the above, Contractor's work may be observed periodically by Owner, and/or Consultant or their representatives, without notice or without request from Contractor.

.4 Contractor shall notify Consultant of completion of work at various stages. Notification shall be made as a minimum as noted below where mechanical work is involved (provide minimum 5 working day's notice), whereupon the Consultant may visit site to periodically observe the work:

.1 Before structural pours,

.2 After mechanical equipment is installed into final location, but before energization.

.3 After main piping and ducting are installed and terminated.

.4 Before closing walls and ceilings,

.5 At first energization of equipment,

.6 At commissioning,

.7 At final completion of project,

.8 At demonstration of operation of mechanical equipment.

.5 Where observation reports are submitted, the Contractor is responsible for rectifying issues noted in the Observation Reports in a timely manner and before covering up the work or affecting access to it.

1.8 WELDING REGULATIONS

.1 Do not weld when temp. of base metal is lower than -17 deg. C except with consent of Consultant. At temp. below 0 deg. C, surface of all areas within 75mm (3") of point where weld is to be started to be heated to temp. at least warm to hand before welding is commenced. At all temperatures below +4 deg. C, operator and work to be protected against direct effect of wind and snow.

.2 Welding shall be performed by welder holding current welder's certificate from Provincial Department of Labour.

.3 Comply with CSA W117.2 "Safety in Welding, Cutting, and Allied Processes".

1.9 MECHANICAL SHOP DRAWINGS

.1 Submit for review PDF (Electronic Copy) of detailed shop drawings. Refer to Section 21 05 00 "Acceptable Equipment, Materials & Products - Mechanical" for shop drawings requirements.

.2 Check shop drawings for conformity to plans and specifications before submission.

.3 Each drawing to bear a signed stamp including project name and Contractor's Firm name verifying drawings have been checked prior to submission to Engineer. Signature of stamp shall signify the contractor has checked and found all dimensions to be compatible with the contract drawings and all capacities, quantities, sizes and other data contained in the contract documents have been listed by the supplier on the drawings and have been checked by the undersigned and found correct.

.4 Clearly show division of responsibility. No item, equipment or description of work shall be indicated to be supplied or work to be done "By Other's or By Purchaser". Any item, equipment or description of work shown on shop drawings shall form part of contract, unless specifically noted to contrary.

.5 Take full responsibility for securing and verifying field dimensions. In case where fabrication must proceed prior to field dimensions being available, check all shop drawings and approve for dimensions only. In this case guarantee that dimensions will be worked to and ensure that other sub-trades are aware of these dimensions and shall comply to them.

.6 Review by Consultant shall be mutually understood to refer to general design only. If errors in detailed dimensions or interference with work are noticed, attention of Contractor will be called to such errors of interferences, but Consultant's review of drawings will not in any way relieve Contractor from responsibility for said errors or interferences, or from necessity of furnishing such work, and materials as may be required for completion of work as called for in contract documents.

1.10 MECHANICAL SUB-TRADES

.1 State in tender, names of all sub-trades to be used in sublet work. Also, state extent of any work so sublet. Request and receive Consultant's approval in writing, of all sub-trades for such work before placing sub-trade contract.

.2 Contractor to have minimum five years experience in field of mechanical contracting and to have successfully performed work of similar nature and approximate size to that indicated in specifications and on drawings. Sub-trades shall employ, on this project, foremen or supervisory personnel who have had similar experience to that required of Contractor.

1.11 DRAWINGS

.1 Drawings are diagrammatic only and do not show all details. Information involving accurate measurements of building to be taken from Architectural Drawings and/or at building. Make, without additional expense to Owner, all necessary changes or additions to runs to accommodate structural conditions. Locations of pipes, ducts and other equipment to be altered without charge to Owner, provided change is made before installation and does not necessitate additional materials and that all such changes are ratified by Consultant, recorded on Record Set of Drawings.

.2 Drawings and specifications to be considered as an integral part of Contract Documents. Neither drawings nor specifications to be used alone. Misinterpretation of requirements of plans or specifications shall not relieve Contractor of responsibility of properly completing work to approval of Consultant.

.3 As work progresses and before installing piping, ductwork, fixtures and equipment interfering with interior treatment and use of building, consult Consultant for comments. This applies to all levels and proper grading of piping. If Contractor fails to perform above checking and fails to inform Consultant of such interference, Contractor to bear all subsequent expense to make good the installation.

.4 Drawings indicate general location and route to be followed by pipes and ducts. Where required pipes and/or ducts are not shown on plans or only shown diagrammatically, install in such a way as to conserve head room and interfere as little as possible with free use or space through which they pass.

1.12 MATERIALS

.1 Materials and equipment specified and acceptable manufacturers are named in this specification for the purpose of establishing the standard of materials and workmanship to which Contractor shall adhere. Tender price shall be based on the use of materials and equipment as specified.

.2

.1 Materials of same general type to be of same manufacture (e.g. all air supply units shall be of same manufacturer). Contractor to ensure that all sub-trades provide products of same manufacturer.

.1 Follow manufacturer's recommendations for safety, adequate access for inspection, maintenance and repairs of individual equipment installed.

.2 Permit equipment maintenance and disassembly with minimum disturbance to connecting piping and duct systems and without interference with building structure or other equipment.

.3 Provide accessible lubricating means for bearings, including permanent lubricated 'Lifetime' bearings.

.3 Contractor may propose alternate for any specified item which Contractor considers equal to that specified. Submit with tender complete specifications for proposed alternate together with amount to be added to or deducted from tender price for consideration by Consultant. All alternate items submitted for consideration must not exceed available space limitations. All additional costs for mechanical, electrical, structural and/or architectural revisions required to incorporate materials substituted by Contractor shall be responsibility of Contractor.

.4 Equipment listed as 'equal' in specifications or submitted as alternate by Contractor must meet all space requirements, specified capacities and must have equipment characteristics of specified equipment as interpreted by Consultant. Install equipment in strict accordance with manufacturer's published recommendations.

.5 Equipment and materials shown on drawings and not specified herein, or specified herein and not shown on drawings, shall be included in this contract as though both shown and specified.

1.13 REMOVAL AND DISCONNECTION OF OWNER'S EXISTING EQUIPMENT

.1 All mechanical equipment conflicting with new equipment being installed to be removed or disconnected by Contractor shall become property of Contractor. Remove ducts and piping not required in revised systems and interfering with new installation which shall become property of Contractor.

.2 Mechanical drawings indicate most mechanical equipment to be removed and/or disconnected. Mechanical equipment to be removed due to removal of walls of existing building, to be removed and pipes capped off by Contractor at no additional cost to Owner.

1.14 MISCELLANEOUS APPARATUS AND APPLIANCES

.1 Make all required mechanical connections (direct or indirect) to devices, equipment, and appliances furnished by other trades or Owner, as indicated or implied on the drawings or in the specifications.

.2 Verify mechanical connection requirements of all equipment prior to rough-in. Report any discrepancies to consultant immediately. Revise pipe/duct size, and configurations as required to accommodate the mechanical service characteristics of the equipment supplied by other trades or Owner.

.3 Provide all required mechanical fittings, connections, and components to ensure proper and complete installation.

.4 Install all devices and components shipped loose with equipment/appliances for field installation.

.5 Coordinate with supplier, installer, other trade, and/or Owner to ensure a proper and complete installation.

1.15 HANGERS AND SUPPORTS

.1 General

.1 Piping shall be securely supported from building structure. Perforated strap or wire hangers are not permitted.

.2 Support components shall conform to Manufacturers Standardization Society Specification SP-38.

.2 Installation - Horizontal

.1 Hangers shall adequately support piping system. Locate hangers near or at changes in piping direction and concentrated loads. Provide vertical adjustment to maintain pitch required for proper drainage. Allow for piping expansion and contraction. Piping weight and stresses shall be supported independently of any equipment.

.2 Maximum spacing between pipe supports:

.1 Steel Pipe:

.1 Up to 50mm (2") diam. - 2.4m (8 ft.)

.2 62mm (2-1/2") and larger - 3.6m (12 ft.)

.3 Installation - Vertical Piping

.1 Support vertical pipes at each floor by Anvil Fig. 261 riser clamps. Locate clamps immediately below coupling if possible. Support soil pipe at hub. Brace risers up to 50mm (2") size at intervals not over 2.13m (7'). Support base in approved manner.

.4 Structural Attachments

.1 To Concrete:

.1 Place inserts in structural floors for support of piping and equipment prior to pouring of concrete. Inserts in concrete slabs shall be Anvil Fig. 285 Light Weight Concrete Insert for loads up to 182 Kg (400#) or Anvil Fig. 281 Wedge type concrete insert for loads up to 544 Kg (1200#).

.2 Support hangers in corrugated steel deck by 50mm (2") piece of 3mm (1/8") thick steel plate placed across top of steel deck, secured to hanger rod by washer and nut; prior to pouring of concrete topping.

.3 Where inserts must be placed in existing concrete use Hilti H.D.I. steel anchors as recommended by manufacturer, or if heavy weights must be supported, drill hole through slab and provide 50mm x 50mm (2" x 2") washer and nut above rough slab before floor finish is poured.

.2 To Steel Beams:

.1 Where pipe size is 50mm (2") or less, use Anvil Fig. 87 Malleable Iron C-Clamp and Retaining Clip, or equal.
.2 Where pipe size is over 50mm (2"), use Anvil Fig. 229 Malleable Beam Clamp or Fig. 228 Forged Steel Beam Clamp.

.3 To Wooden Ceilings and Beams:
.1 Use Anvil Fig. 153 Pipe Hanger Flange or Fig. 156 or equal.

.4 Miscellaneous:
.1 Provide suitable attachments equal in quality to above where required.

.5 Hangers and Supports
.1 Steel Pipe: Up to 50mm (2") - Anvil Fig. 65 light clevis - size to suit O.D. of pipe. 62mm (2-1/2") and larger - Fig. 260 clevis - size to suit O.D. of insulation.
.2 Provide fabricated steel supports as detailed on drawings or as required to adequately support piping and equipment. Details to be approved by Consultant. Supports shall be of welded construction except where adjustment is required.
.3 Where thermal expansion in excess of 12mm (1/2") axially is anticipated, or where indicated, use Anvil Fig. 171 Adjustable Pipe Roll or Anvil Fig. 271 Pipe Roll Stand.
.4 For vertical piping support, use Anvil Fig. 261 clamp. For vertical copper piping, use Fig. CT-121-C.
.5 Above indicates general requirements. Provide hangers and supports of equal quality to suit job requirements where not covered by the above.
.6 Support groups of horizontal pipes by angle iron trapeze hangers.
.7 Rollers and chairs shall not be installed on trapeze hangers.
.8 Several individual hanger rods may be supported from a trapeze or individual inserts in concrete slab.
.9 Hangers to be adjustable after pipe is in place. Parts must be of adequate strength for weight to be supported with safety factor of 5 to 1.
.10 Hanger Rod:
.1 Support hangers with mild steel rod. Load on hanger not to exceed capacity indicated in following table:
.2 Rod Diam. Max. Safe Load
.1 9.5mm(3/8") 277 Kg(610 lbs.)
.2 13mm(1/2") 514 Kg(1130 lbs.)
.3 16mm(5/8") 822 Kg(1818 lbs.)
.4 19mm(3/4") 1232 Kg(2710 lbs.)
.3 Rods to have sufficient threaded length to allow for vertical adjustment after pipe is in place. Use two nuts in each rod, one above clevis or angle iron, and one below.

.6 Isolation
.1 Copper piping shall be isolated from steel supports by copper plated hangers, plastic coated hangers, tinning pipe at supports, or provision of suitable lead or copper isolators. Where no pipe movement or abrasion is expected, suitable plastic electricians tape may be wrapped around pipe at hangers.

.7 Protection Saddles
.1 On piping 50mm (2") and smaller, carry insulation over pipe hangers. Canvas jacket shall be neatly cut and formed to fit over hangers. On chilled and cold water piping, insert sections of insulation into space above pipe at each hanger. Seal saddle and pipe with insulation.

.2 On insulated steel pipe over 50mm (2") diam. use at each hanger or support, Anvil Fig. 160, 161 or 162 to suit pipe size and insulation thickness. Pack space between saddle and pipe with insulation.

.3 On copper piping over 50mm (2") diam. use at each hanger or support Anvil Fig. 167 protection shield or equal. Shields shall have minimum length of 300mm (12") to spread weight.

1.16 SUPPORTS, BASES, PITS

.1 Supply and erect all special structural work required for installation of tanks, pumps, fans, motors and other apparatus.

.2 Mount equipment suspended above floor level but not detailed on platform bracketted from wall. Where wall thickness is inadequate to permit such brackets, carry supports to either ceiling or floor, or both as required.

1.17 SCREWS, BOLTS AND FASTENERS

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

.2 Use heavy hex heads, semi-finished unless otherwise specified. Use non-ferrous material throughout for plumbing services. Use type 304 stainless steel for exterior areas.

.3 Bolts used on fan equipment for access to motors, bearings, filters and the like shall be heavy-duty.

.4 Bolts shall not project more than one diameter beyond nuts.

.5 Washers

.1 Use plain-type washers on equipment, sheet metal and soft gaskets, lock-type washers where vibration occurs, and resilient washers with stainless steel.

1.18 SPECIAL TOOLS AND SPARE PARTS

.1 Identify spare parts containers as to contents and replacement parts number.

.2 Provide one set of all specialized tools required to service equipment as recommended by manufacturers.

.3 Furnish one grease gun and adaptors to suit different types of grease and grease fittings.

1.19 TEMPORARY USE OF EQUIPMENT

.1 Permanent systems and/or equipment not to be used during construction period, without Consultant's written permission.

.2 Equipment used during construction period to be thoroughly cleaned and overhauled. Replace worn or damaged parts so equipment is in perfect condition, to entire satisfaction of Consultant and Owner.

.3 Provide proper care, attention and maintenance for equipment while it is being used. If, in opinion of Consultant, sufficient care and maintenance is not being given to equipment and systems, Consultant reserves right to forbid further use of said equipment and systems.

.4 Temporary use of equipment shall in no way relieve Contractor of providing twelve month guarantee on all equipment so used this guarantee period to commence as of date of final acceptance of building by Owner as interpreted by Consultant.

.5 All air filters shall have bi-monthly inspection. Filters shall be cleaned and/or replaced depending on filter type during period in which ventilation units are being used for temporary heat and/or commissioning of system. Contractor to be responsible for and pay all costs for air filter cleaning service. Filters to operate between pressure drops noted in filter manufacturer's catalogue.

1.20 RECORD DRAWINGS

.1 Provide one set of Contract prints to form Record Drawings, marked clearly with all changes and deviations from piping and ductwork, including all Contract Changes.

.2 Use different colour ink for each service.

.3 Update Record drawings on a regular basis to ensure they are accurate, and have available for reference and inspection at all times.

.4 This information will be used by others to create Record Drawings on CAD.

1.21 INSTRUCTIONS TO OWNER'S PERSONNEL

.1 In addition to start-up supervision and instruction of Owner's personnel required of individual equipment manufacturers and systems as noted, Contractor's construction supervisor to instruct Owner's personnel in operation and maintenance of all equipment and systems to satisfaction of Consultant.

.2

.1 All instructions to Owner's personnel shall be video taped by the Contractor.
.2 This video will remain property of the Owner and will be used for the sole purpose of training and orientation of Owner's maintenance staff.
.3 Instruction shall include visual materials such as drawings, diagrams, and printed handouts.
.4 Instructor(s) shall provide the necessary audio-visual equipment and other aids necessary to convey thorough understanding of system and/or equipment operation and maintenance.
.5 Provide Owner with one copy of video taped session in digital format. Coordinate with Owner for final video format.

.3 Provide Owner with four copies of manuals incorporating following:

.1 Service instructions - including lists of spare and replacement parts and names and addresses of suppliers.
.2 Maintenance & Operating instructions.
.3 Revised shop drawings.

.4 Forward manuals to Consultant for review. Final payment will not be made until all required manuals have been received.

.5 Review instructions with Owner's representative to ensure Owner's representative has a thorough understanding of equipment and its operation.

.6 Contractor shall submit to Consultant, suitable document signed by Owner's representative, stating:

.1 Owner has received satisfactory instruction in operation and maintenance of all equipment and systems.
.2 Operation and maintenance manuals have been reviewed with Owner.
.3 Specified spare parts. keys, removable handles and the like, have been turned over to Owner.

1.22 CUTTING AND PATCHING

.1 Cutting, patching and repairs to existing surfaces required as a result of the removal and/or relocation of existing equipment and piping, and/or installation of new equipment and piping in existing building(s) to be included by Divisions 21, 22, 23 and 25 - Mechanical in tender price. Divisions 21, 22, 23 and 25 - Mechanical to employ and pay appropriate sub-trade whose work is involved, for carrying out work described above.

.2 Where services are concealed within walls, floors or ceilings and cannot be visually identified, Contractor shall provide electronic scanning devices or other approved means to locate and identify concealed services prior to drilling.

1.23 SALVAGE

.1 Mechanical equipment, ductwork, and piping for mechanical systems not required in new layout to become property of Contractor. Remove material from site.

.2 Mechanical drawings indicate most mechanical equipment to be removed and/or disconnected. Mechanical equipment not indicated on drawings as being removed or disconnected, but which has to be removed due to removal of walls of existing building, to be removed and pipes capped off by Contractor at no additional cost to Owner.

1.24 CLEANING AND FLUSHING OF PIPING SYSTEMS

.1 On completion, each piping system shall be flushed out before installation of equipment, fixtures, etc. in order to remove any foreign material in piping.

.2 Flush with water, unless noted otherwise in individual mechanical sections of specifications.

.3 All plumbing fixtures and all equipment shall be thoroughly cleaned and left in first class operating condition.

1.25 ASBESTOS CONTROL PROCEDURES

.1 This building may contain asbestos in the existing piping and equipment insulation.

.2 For further information regarding procedures contact: Workplace Safety and Health, Office of the Fire Commissioner Inspection and Technical Services, Province of Manitoba.

1.26 ACCESSIBILITY OF EQUIPMENT

.1 All equipment must be accessible, as defined as follows: Ceiling mounted equipment shall only be considered accessible if a tradesman can place both hands on the component which requires servicing (i.e. fan motor, belt, pulley, bearings, fire damper linkage, valve/control valve, strainer cleanouts or any other equipment component which requires periodic maintenance). The component must be in clear view, and access must be gained from an 8 or 10 foot step ladder. Access panels provided in drywall shall be sized and placed in such a manner that a manner that a tradesman can place two hands on the component as stated above.

.2 Divisions 21, 22 ,23 and 25Mechanical Contractors shall coordinate attendance at an early construction meeting with the General Contractor, Electrical Contractor, Owner's representative and Consultant to review ceiling space coordination protocols.

.3 Equipment located above acoustic tile ceilings shall be positioned in such a manner that equipment and components can be accessed through a full tile which does not contain any devices, such as light fixtures, speakers, smoke detectors or sprinkler heads. If this is not possible, it should be reviewed by the Consultant/Owner.

.4 All serviceable mechanical equipment shall be located within 900mm of the finished ceiling.

.5 Conduit, pipe, ducting and support members, or any other obstructions to accessibility shall be relocated at the contractor's expense, by the contractor's forces.

.6 General Contractors/Mechanical Sub-Contractors and Electrical Sub-Contractors: Refer to Drawing M-305. Please note that Division 26 will be required to install feeders above Divisions 21, 22 & 23 mechanical piping & ductwork on all levels. Division 26 will run conduits 'Flat' below structure in most cases. Offsetting up against structure will be done where Divisions 21, 22, & 23 need the additional space. Mechanical & Electrical to coordinate layouts to avoid covering pull boxes, etc. Divisions 21, 22 & 23 to allow a minimum of 6" below structure for Division 26 to 'Flat-Run' feeder conduits. Division 26 to offset conduits where required by mechanical for their clearances.

1.27 PRESSURE PIPING QUALITY ASSURANCE MANUAL AND DOCUMENTATION

.1 Contractors working on pressure piping systems must be registered with the Office of the Fire Commissioner Inspection and Technical Services for work on Pressure Piping Systems and upon award of contract present a copy of their Quality Control Manual and Procedures for review by the Plumbing Shop Supervisor.

.2 The Mechanical Contractor shall provide one copy of the Contractor's Certificate of Authorization issued by the Office of the Fire Commissioner Inspection and Technical Services, Mechanical & Engineering Branch (OFCITS). Include one copy in O&M Manuals.

.3 Provide a complete copy of the Quality Assurance Manual registered with and approved by the OFCITS. Include one copy in O&M Manuals.

.4 Provide all record information that is specified in the Quality Assurance Manual on pressure vessel and pressure piping systems under GSA-B51. Include one copy in O&M Manuals.

.5 Information shall include, but is not limited to:

.1 Pipe and fitting mill certificates, metallurgy and heat numbers for traceability.
.2 Valve and pressure vessel ORN numbers.
.3 Fitting registrations where required.
.4 Welding procedures, records and inspection reports.
.5 MLMEB inspection reports.
.6 Quality control inspection reports.
.7 Hydrostatic test reports on each system subject to GSA – B51.
.8 Material acquisition data sheets.

1.28 AS BUILT DRAWINGS

.1 Provide as built drawings for entire installation. As-built drawings shall be accurate to within 1 meter of actual location. Any deviations found upon review of the as-built information shall be corrected by the Contractor with no additional cost to the owner.

.2 Refer to Section 01 78 00 - Project Closeout for requirements

END OF SECTION

Part 1 General

1.1 GENERAL

.1 Following Appendix of Manufacturers lists manufacturers of equipment and materials acceptable to Consultant, subject to individual clauses under the various sub-sections of Mechanical Work Specifications. See item 'Materials' under this section of specification.

.2 Product noted in individual specification clauses is an item that meets specification in all respects regarding performance, quality of material and workmanship, and is acceptable to Consultant without qualification. Equipment proposed from other manufacturers listed as 'Approved Manufacturers' and alternates shall meet same standards.

.3 Contractor to submit within forty-eight hours of notification from Consultant, one (1) copy of fully and properly completed Appendix of Manufacturers listing thereon names of manufacturers of products which shall be used to execute work of Contract. If list is not submitted within 48 hours, Contractor must use product named in each individual clause.

.4 Submit shop drawings for all items marked with asterisk(*).

.5 Contractor may propose alternate for any specified item which Contractor considers equal to that specified. Submit with tender complete specifications for proposed alternate together with amount to be added to or deducted from tender price for consideration by Consultant. All alternate items submitted for consideration must not exceed available space limitations. All additional costs for mechanical, electrical, structural and/or architectural revisions required to incorporate materials substituted by Contractor shall be responsibility of Contractor.

.6 Equipment listed as 'equal' in specifications or submitted as alternate by Contractor must meet all space requirements, specified capacities and must have equipment characteristics of specified equipment as interpreted by Consultant. Install equipment in strict accordance with manufacturer's published recommendations.

1.2 REQUEST FOR EQUAL

.1 Applications for approval of equal, or alternate materials, or methods, as substitutions for those specified or shown, shall be submitted to the Consultant not later than five (5) working days before tenders are due.

.2 Request received later than five (5) working days before tenders are due will not be considered.

.3 Request shall be in writing, electronic files in Adobe Acrobat PDF format.

.4 Any request for equal shall include the following:
- .1 Project name (including building number).
- .2 Project number.
- .3 Submission date.
- .4 Name of Contractor.
- .5 Name of Consultant.
- .6 Identify the product or the fabrication or installation method to be replaced in each request.
- .7 Submit shop drawings as outlined in related product specification.
- .8 Submit any other information requested in the related specification section.

.9 Include related specification section and drawing numbers.

.10 Provide comply/non-comply list addressing each item of the specifications, mechanical schedules, and drawings with each request for equal. This shall include a photocopy of all applicable specification sections showing a complete compliance / non-compliance listing. Refer to spec detail sheet "Shop Drawing Compliance List Sample", for example, (this detail sheet applies to Requests for Equal as well).

.11 Catalogue information, technical data, full detail, weight, size, performance, and power requirements of the proposed equipment and all components.

.12 Installation procedures.

.13 Samples, where applicable or requested.

.14 Provide equipment wiring diagram showing power connection points, required amperages and voltages, etc. with any requests.

.15 Coordination information, including a list of changes or modifications needed to other parts of the work and to construction performed by the owner and/or contractors that will be necessary to accommodate the proposed equal.

.5 Consultant will review each request, determine action required, and respond. Allow five (5) working days for Consultant's response for each request. Requests received by Consultant after 1:00 p.m. will be considered as received the following working day.

.6 Consultant's action may include a request for additional information, in which case Consultant's time for response will date from time of receipt of additional information.

.7 If approval is to be granted, the Consultant will reply prior to the closing of tenders, by issuing an addendum.

.8 Tender closing date may be extended if in opinion of the Consultant additional time is required for competitive contractors to review and include in their bids.

.9 If an "Equal" has been granted, the choice between the materials or methods specified and those approved as equal shall be optional.

.10 If an "Alternate" has been approved, the difference in cost between this alternate and the specified material or method shall be stated in the tender as an "add to" or "delete from" the tender price and the choice of materials or methods shall rest with the Consultant.

.11 Costs for any required additional material, wiring and labour due to the granted equal or approved alternate shall be included in the tender price or alternate price. This shall include costs which are incurred by other Divisions of this specification.

1.3 LIST OF ACCEPTABLE MANUFACTURERS

.1 Refer to Section 01630.

1.4 EQUIPMENT OR MATERIAL & APPROVED MANUFACTURERS

.1 INSULATION

.1	Pipe Insulation	Manville; Owens Corning; Knauf; Pabco; Fibreglas
.2	Lagging Adhesive/Coating	Bakor; Childers; Fosters
.3	Aluminum pipe jacket	Childers; Permaclad; Pabco
.4	PVC pipe jacket	Sure-Fit

.2 VIBRATION CONTROL

.1	Vibration Control Products*	Vibro-Acoustics; Airmaster; Vibron; Kinetics; SVC Ind.

END OF SECTION

Part 1 General

1.1 GENERAL

.1 All drawings and all sections of the specification shall apply to and form an integral part of this section.

1.2 WORK INCLUDED

.1 Labour, material, plant, tools, equipment and services necessary and reasonably incidental to completion of external insulation for mechanical piping.

1.3 RELATED WORK SPECIFIED ELSEWHERE

.1 Section 21 05 00 – Mechanical General Provisions.

.2 Section 21 05 10 – Acceptable Equipment, Materials and Products - Mechanical.

.3 Section 23 60 10 – Liquid Heat Transfer.

Part 2 Products

2.1 MATERIALS

.1 All materials shall be equivalent in all respects to specified products and shall be used only in applications intended by the manufacturer. Materials not specifically intended for the purpose shall not be used. Approved materials shall not be diluted or blended with other materials unless specifically recommended by the manufacturer of the approved material.

.2 All final pipe and duct installations including insulation, covering and adhesive shall have a ULC Certified flame spread rating of not greater than 25, and a smoke developed classification of not more than 50.

.3 All canvas shall be treated to be fire retardant in accordance with ULC standards.

.4 Wire to be 1.2mm (18 ga.) stainless steel, dead soft annealed, type 304.

.5 U.L.C. label or satisfactory certified report from approved testing laboratory is required to indicate that fire hazard ratings for materials proposed for use do not exceed those specified.

.6 Flameproofing treatments subject to deterioration due to effects of high humidity are not acceptable.

.7 Consultant reserves the right to demand test samples of components of insulation systems for fire hazard test rating.

2.2 COMPATIBILITY OF COMPONENTS

.1 All adhesives, sealers, vapour coating, mastics, laggings and bedding compounds, shall be compatible with materials to which they are applied. They shall not soften, corrode, or otherwise attack such material in either wet or dry state and shall only be those recommended by manufacturer of insulation as suitable for application proposed. They shall be applied at ambient conditions acceptable to the manufacturer.

2.3 HOT INSULATION - HEATING

.1 Materials

.1 On piping 50mm (2") diam. and under, use 25 (1") Fibreglas 88 kg/m(5-1/2 lb./cu. ft) density pipe insulation with ASJ all service jacket and self seal lagging adhesive.

.2 On piping 62mm (2-1/2") diam. and larger, use 37mm (1-1/2") Fibreglas 88 kg/m.

.3 For high pressure steam piping, 345 kPa (50 psig) and above use 50mm (2") thickness of above piping.

.2 Location

Hot water heating supply and return piping, including accessory apparatus such as air eliminators and the like.

Part 3 Execution

3.1 WORKMANSHIP

.1 Work shall be performed by licensed journeymen.

.2 Apply insulation materials, accessories and finishes in accordance with manufacturer's recommendations.

.3 Do not apply coverings until hydrostatic tests have been completed, surfaces are free of grease, scale, moisture, and heat tracing where required has been installed. Insulation shall be clean and dry when installed and during application of any finish.

.4 Apply insulation and coverings to equipment and piping which will operate with hot or warm liquid vapour, while surface is hot. Provide any required temporary heat to accomplish this.

.5 Cold surfaces to be dry and ferrous surfaces to be coated with rust penetrating protective paint before applying insulation and vapour barriers.

.6 Vapour barriers and insulation to be complete over full length of pipe or surface, without penetration for hangers, duct or seams, and without interruption at sleeves, pipe and fittings.

.7 Install insulation with smooth and even surfaces, with round shapes laid to true circular and concentric shape, shaped to blend with fitting insulation and adjacent covering; with full length section and tight to insulated object.

.8 Pack solid around all pipes where they pass through sleeves in walls, floor slabs, etc. for full thickness of floor with fibreglas or rockwool. Refer to firestopping clause where piping passes through fire separations. On all services, carry full insulation thickness through walls, floors, etc. Protect insulation of exposed pipes passing through floors with 1.2mm (18 ga.) galv. iron 150mm (6") from finished floor.

.9 On piping, gouge out insulation for proper fit where there is interference between weld bead and insulation. Bevel insulation away from studs and nuts to permit their removal without damage to insulation. Closely and neatly trim around extending parts of pipe saddles, supports, hangers and clamp guides. Seal with insulating cement.

.10 Use pipe covering protection saddles with roll type hangers unless otherwise indicated.

.11 Butt joints

.1 Place joints on top of duct wherever practical. Butt joints on side of duct for flexible duct insulation.

.2 Adhere and seal laps of vapour barrier cover or vapour barrier strip of 100mm (4") minimum width furnished with insulation, using vapour seal adhesives.

.12 Sagging of duct insulation will not be acceptable.

.13 Stagger both longitudinal and horizontal joints, on duct insulation of multilayered construction.

.14 Protect insulation against elements during all stages of application.

.15 Do not cover manufacturer's nameplates. Cut insulation on 45 degree angle to nameplate edge and seal.

.16 Covering to be uniform in diameter, smooth in finish. Place longitudinal seams so as to be invisible.

3.2 HOT INSULATION - HEATING

.1 In general, match the existing finish of insulation on site. For any locations where existing insulation painting is damaged repair painting to match the existing.

.2 Application as per Clause "Cold Insulation- Plumbing".

.3 Insulate flanges, fittings and valve bodies, etc.

.4 Fasten longitudinal laps with staples and seal with Swifts Adhesive #3218.

.5 Butt joints wrapped with a 100mm (4") strip of ASJ. Stagger joints on multiple layers.

.6 Refinish exposed piping with canvas and coat with Bakor 120-18 white fire retardant lagging adhesive.

.7 All fittings shall be insulated by wrapping with 25mm (1") thick layers of 12 kg/m(3/4 lb./cu.ft.) density flexible fibreglass attached with jute twine. Surface shall be wrapped

with Friction Tape and sealed with and asphaltic sealing compound. Over this to be applied a smooth coating of insulating cement. Recover fittings with ASJ jacket applied directly over the smooth coat of cement. Brush coat with Bakor 120-18 white fire retardant adhesive.

END OF SECTION

Part 1 General

1.1 SUMMARY

.1 Section Includes:

.1 Design, engineering, approvals by AHJ, permits, installation, testing, certification, and commissioning of wet pipe sprinkler systems as described herein, within related contract documents, and as diagrammatically illustrated on the Contract Drawings.

1.2 ACTION SUBMITTALS

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

.2 Product Data:

.1 Provide manufacturer's printed product literature and data sheets, and include product characteristics, performance criteria, physical size, finish and limitations.

.3 Shop Drawings:

.1 Provide detailed engineered layout of wet pipe sprinkler system meeting requirements of AHJ.

.1 Include:

.1 Hazard Analysis,
.2 Working Plans,
.3 Assembly Details,
.4 Water Supply Information,
.5 Hydraulic Calculations, and
.6 Hydraulic Calculation Forms.

.2 Materials to show:

.1 Finishes,
.2 Method of anchorage,
.3 Number of anchors,
.4 Supports, and
.5 Accessories.

.4 Samples:

.1 Submit the following samples:

.1 Each type of sprinkler head including escutcheon plates.
.2 Fire department connection placards, signs, and wall plates; one of each type.

1.3 QUALITY ASSURANCE

.1 Qualifications:

.1 Installers: Journey person(s) specializing in wet pipe sprinkler system assembly with provincial certification applicable at the location of the Work.

.2 Licensed Professionals: Professional Engineer(s) Licensed to practice engineering at the location of the Work.

.2 Supply grooved joint couplings, fittings, grooving tools and specialties from a single manufacturer.

Part 2 Products

2.1 PERFORMANCE / DESIGN CRITERIA

.1 Design: in accordance with required and advisory provisions of NFPA 13 and Owner's Insurer.

.1 Sizing: by hydraulic calculations for uniform distribution of water over design area for light hazard occupancy and in compliance with requirements for hazard classification to satisfaction of the AHJ.

.2 Include with each system all materials, accessories, and equipment inside and outside building to provide each system complete and ready for use.

.3 Design and provide each system giving full consideration of blind spaces, piping, electrical equipment, ducts, and other construction and equipment as located in contract drawings including changes made during tender and construction.

.4 Locate sprinkler heads in consistent pattern with ceiling grid, lights, and air supply diffusers. Coordinate sprinkler head layouts and head types with Prime Consultant prior to submission of final shop drawings.

.5 Devices and equipment for fire protection service: ULC approved for use in wet pipe sprinkler systems.

.6 Location of Sprinkler Heads:

.1 Locate heads in relation to ceiling and spacing of sprinkler heads not to exceed that permitted by NFPA 13.

.2 Uniformly space sprinklers on branch lines.

.7 Water Distribution:

.1 Make distribution, where possible, uniform throughout the entire zone.

.8 Sizing:

.1 Size pipe to provide specified density when system is discharging specified total maximum required flow.

.2 Include factor of safety in sizing equivalent to remote systems minimum end head pressure, but no less than 48.26 kPa (7 psi).

.9 Sprinkler Discharge Area:

.1 Area: hydraulically most remote area as defined in NFPA 13.

.10 Hose Allowances:

.1 Include allowance in hydraulic calculations for outside and inside hose streams to meet NFPA 13 and satisfaction of AHJ.

.11 Friction Losses:

.1 Calculate losses in piping in accordance with NFPA 13.

Use Hazen-Williams formula with 'C' value of:

.1 120 for steel piping,

.2 150 for copper tubing,

.3 and 140 for cement-lined ductile-iron piping.

2.2 MATERIALS

.1 Pipe, Fittings and Valves

.1 General: materials shall meet requirements of NFPA 13 and Owner's Insurer requirements including when not listed herein.

.2 Pipe:

.1 Ferrous:

.1 Material: Schedule 40 black steel meeting requirements of NFPA 13 and the following:

.1 Diameter: Nominal Pipe Size to ASTM A53.

.2 Type: Electric resistance welded (Type E), Grade B to ASTM A53.

.3 Tensile Strength: minimum 415 MPa (60,000 psi).

.4 Yield Strength: minimum 240 MPa (35,000 psi).

.2 Bending: Not permitted unless specifically approved by Consultant. Where bending is required pipe meeting ASTM A53 Grade A may be required as directed by Consultant.

.2 Copper tube: Type L to requirements of NFPA 13.

.3 Fittings and joints:

.1 Ferrous: screwed, welded, flanged, or roll grooved to requirements of NFPA 13.

.2 Copper tube: screwed, soldered, brazed, or roll grooved to requirements of NFPA 13.

.3 Welded:

.1 To CSA C W117.2.

.2 Welder certified to CSA B51 and provincial authority having jurisdiction.

.3 Weld joints and connection outlets in fabrication shop; field welding of final connections will be permitted.

.4 Conform to regulatory requirements including fire watch.

.4 Ensure fittings, mechanical couplings, and rubber gaskets are supplied by same manufacturer.

.5 Hole drilled outlets: to use rubber gasket and coupled housing for mounting.

.4 Pipe hangers: to NFPA 13.

.1 Provide engineered pipe hangers as required.

.2 Sprinkler Heads

.1 General: to NFPA 13 and ULC listed for fire services.

.3 Sleeves

.1 Provide sleeves where pipping passes through walls and floors.

.4 Escutcheon Plates

.1 Provide one piece type metal plates for piping passing through walls, floors, ceilings in unfinished exposed spaces.

.2 Provide 16 gauge brushed #4 satin finish, TP304L stainless steel plates in finished spaces. Mounting system to eliminating movement and vibratory noises; system to be non-permanent and reusable.

.3 Provide paint finish on metal plates and where indicated on drawings and/or schedules.

Part 3 Execution

3.1 INSTALLATION

.1 Install, inspect and test to acceptance in accordance with NFPA 13, NFPA 25, and AHJ.

.2 Areas of work:

.1 The existing building is currently sprinklered. Allow for removal and installation of sprinkler heads as required to complete work where ceilings are to be removed.

.2 In areas of new mechanical and electrical installation allow for adjusting and adding sprinkler heads to maintain coverage per NFPA 13.

3.2 FIELD QUALITY CONTROL

.1 Test and Observation:

.1 Perform test to determine compliance with specified requirements to satisfaction of AHJ.

.2 Preliminary Tests:

.1 Hydrostatically test each system at 200 psig for a 2 hour period with no leakage or reduction in pressure.

.2 Flush piping with potable water in accordance with NFPA 13.

.3 Piping above suspended ceilings: tested, inspected, and approved before installation of ceilings.

.4 Test alarms and other devices.

.5 Test water flow alarms by flowing water through inspector's test connection. When tests have been completed and corrections made, submit signed and dated certificate in accordance with NFPA 13.

.3 Develop, with Consultant, detailed instructions for Operations and Maintenance Manual for routine testing of systems.

END OF SECTION

Part 1 General

1.1 GENERAL

.1 All drawings and all sections of the specifications shall apply to and form an integral part of this section.

1.2 WORK INCLUDED

.1 Labour, materials, plant, tools, equipment and services necessary for and reasonably incidental to completion of following services:

.1 Hot water heating

1.3 WORK INCLUDED

.1 Labour, materials, plant, tools, equipment and services necessary for and reasonably incidental to completion of following services:

.1 Hot water heating systems

1.4 RELATED WORK SPECIFIED ELSEWHERE

.1 Section 21 05 00 – Mechanical General Provisions.

.2 Section 21 05 10 – Insulation.

Part 2 Products

2.1 PIPE AND FITTINGS

.1 All pipe & fittings shall be manufactured in Canada or the U.S.A.

.2 Hot Water Heating Services.

.1 Pipe Diameter:

.1 13mm to 250mm (1/2" to 10")- Schedule 40 carbon steel, continuous weld or electric resistance weld pipe conforming to A.S.T.M. A53 Grade B.

.2 300mm to 400mm (12" to 16") - Standard weight carbon steel, electric resistance weld pipe conforming to A.S.T.M. A53 Grade B.

.3 450mm and over (18") - Standard weight carbon steel, submerged arc welded pipe conforming to A.S.T.M. AP15L Grade X42.

.4 All underground steam piping to be Schedule 80 to specifications as above.

.5 All condensate piping to be Schedule 80 to Specifications as above.

.2 Fittings

.1 Unions to be brass to iron ground joint type. Screwed fittings on steel pipe to be best quality 1034 kPa (150 psi) black malleable iron, banded. Nipples to suit pipe type. Thred-O-Lets and Weld-O-Lets to be manufactured to ASTM A181, Grade 1.

.2 Butt welding fittings to be Crane manufactured to ASTM A-234. Flanges to be Gruvlok forged carbon slip-on welding flanges conforming to ASTM A181, Grade 1. Gaskets to be preformed non-asbestos. Site or shop cut gaskets unacceptable. Use ring gaskets on raised face flanges and full faced gaskets on flat face flanges. Use 1034 kPa (150 psi) flanges on water systems to 682 kPa (99 psi). Above 682 kPa (99 psi) use 2069 kPa (300 psi) flanges.

2.2 VICTAULIC PIPING WATER SYSTEMS

.1 All pipe & fittings shall be manufactured in Canada or the U.S.A.

.2 Section 23 60 10 may use mechanical grooved pipe coupling, fittings and butterfly valves, shall be manufactured by Victaulic, for piping systems and mechanical equipment connections (in lieu of welded, flanged, threaded methods) (and may also be used as unions, seismic joints, flexible connections, expansion compensators, vibration reducers) in systems specified.

.3 In systems 2" and larger couplings shall be style 07, 77, 72, 750, 90, 99 and used where applicable. For rigid systems couplings shall be Style 07 Zeroflex complete with angle bolt pad design.

.4 Supply E.P.D.M. Grade 'E' gaskets, with green colour code identification, conforming to ASTM D-2000 designation 2CA615A15B44F17Z.

.5 Fittings shall be grooved end design to accept specified Victaulic couplings without field preparation, such as Victaulic flow fittings. All grooved components shall be of one manufacturer.

.6 Use Victaulic Vic-Flanges for connecting flanged components into grooved system.

.7 Supply pipe grooved in accordance with Victaulic specifications. For grooving on-site, prepare pipe in accordance with same specifications using specially designed tools.

2.3 EXPANSION JOINTS

.1 Manufacturers:

- .1 Fulton
- .2 Senior Flexonics
- .3 Hyspan
- .4 Mercer Rubber Company.
- .5 The Metraflex Company

.2 Type: packless, complete with external guides and traverse stops

.3 Bellows: 316L Stainless Steel

.4 Pressure Rating: 862 kPa (125 psi) working pressure at 204 degrees C (400 degrees F).

.5 End Connections: Flanged. Screwed is acceptable for 50mm (2 in.) and under.

.6 Size: Use pipe size.

.7 Accessories: Internal flow liner.

.8 Location: Where noted on drawings.

.9 Expansion joints shall be selected on the following basis:

.1 Hot water heating - 130 deg. F temp. rise.

.2 At minimum the expansion compensators shall have following compression and expansion values:

.1 EL-1 HWS: 1.5 in. compression & 0.25 in. expansion
.2 EL-1 HWR: 1.5 in. compression & 0.25 in. expansion
.3 EL-2 HWS: 1.0 in. compression & 0.25 in. expansion
.4 EL-2 HWR: 1.0 in. compression & 0.25 in. expansion
.5 EL-3 HWS: 2.0 in. compression & 0.25 in. expansion
.6 EL-3 HWR: 2.0 in. compression & 0.25 in. expansion
.7 EL-4 HWS: 2.0 in. compression & 0.25 in. expansion
.8 EL-4 HWR: 2.0 in. compression & 0.25 in. expansion
.9 EL-5 HWS: 1.0 in. compression & 0.25 in. expansion
.10 EL-5 HWR: 1.0 in. compression & 0.25 in. expansion
.11 EL-6 HWS: 1.5 in. compression & 0.25 in. expansion
.12 EL-6 HWR: 1.5 in. compression & 0.25 in. expansion
.13 EL-7 HWS: 1.5 in. compression & 0.25 in. expansion

2.4 CHEMICAL TREATMENT

.1 Hot Water Heating Cleanout

.1 Provide 45 litres of Veolia Ferroquest FQ7103 preoperational cleaner per 4,500 litres of water in system.

.2 Provide Veolia Ferroquest FQ7102 as required.

.2 Test Kits

.1 Provide test kits as follows:

.1 Closed loop systems:

.1 To determine proper level of inhibitor in closed system treatment.

.2 Pace Solutions – Veolia L6213 molybdenum drop test kit

Part 3 Execution

3.1 PIPE AND FITTINGS

.1 Inside of all pipe, fittings, traps, valves and all other equipment to be smooth, clean and free from blisters, loose mill scale, sand and dirt when erected.

.2 Install screwed unions or flanges at all equipment connections, elements, traps, valves, etc.

.3 Pipe bending is not permitted.

.4 Pipe and fittings up to and including 50mm (2") diam. to be screw jointed with screwed fittings. Make screw joints iron to iron, with graphite and oil filler or joint compound. Dope male threads only. All fuel oil piping shall be welded.

.5 Pipe and fittings 63mm (2-1/2") diam. and above to be jointed by welding. Branch connections to be welded using butt welding fittings. Use slip-on welding flanges, welded to pipe on which they are fitting, at flange neck and back-welded on pipe end, at inside flange face. Valve companion flanges to be flat or raised face, matching valve flange. Use gaskets on flanged joints.

.6 Branch connections of sizes 13mm (1/2"), 19mm (3/4") and 25mm (1") for radiation may be formed on mains of 50mm (2") diam. and above using carbon steel Thred-O-Let welding fittings.

.7 Branch connections of sizes 31mm (1-1/4"), and larger to be formed using Weld-O-Lets. Reductions in mains to be after branches using butt weld reducing fittings. Site or shop fabricated welding fittings not permitted.

.8 Welding to conform to Provincial Department of Labour Regulations. Welders to be licensed.

.9 Use long radius elbows. For pipe reductions use eccentric reducing sockets.

.10 Keep pipe connections clear for tube removal, etc.

.11 Dielectric Couplings

.1 Provide where pipes of dissimilar metals are joined.

.2 Provide unions or flanges for pipe 50mm (2") and smaller and flanges on piping 63mm (2-1/2") and larger.

.3 Use Style 47 Dielectric Waterway as manufactured by Victaulic.

.12 Branch Connections

.1 Type 'K' copper soft temper pipe - Silver braze joints using Handy & Harman's silver brazing alloy and flux. Fittings to Emco smooth bore silver braze fittings.

3.2 VICTAULIC PIPING

.1 Prior to coupling assembly, lightly coat lips and outer surface of gasket with a non-toxic (Vic-Lube) lubricant as recommended by manufacturer. Pipes shall be gapped at time of installation to allow for expansion and contraction of system where required.

3.3 PIPING SYSTEMS

.1 Water and Glycol Piping Systems

.1 Grade up in flow direction or as noted so air may pass through connecting risers, etc. Minimum grading to be 1:480.

.2 General

.1 Install branch riser take-offs to grade up to riser.

.2 Run piping parallel to walls and as unobtrusive as possible when viewed from inside or outside building.

.3 Where pipe change in direction is shown to take up expansion, spring piping cold.

.4 Blow out radiation and coils with compressed air prior to piping connections.

.5 Use welded piping in concealed areas and as a result inaccessible, i.e. plastered ceilings, etc. Control valves, etc. to be accessible through access doors.

.6 Install drain cocks on each pump and at system low points. Pipe to nearest floor drain.

3.4 TESTING OF SYSTEMS

.1 Tests to be carried out in accordance with following time-pressure requirements and with regulations and requirements of authorities have jurisdiction.

.2 Hot water heating - test at 862 kPa (125 psig), or to pressure 1-1/2 times operating pressure, which ever is greatest, for 12 hrs.

.3 Tests to be with water, unless noted otherwise, prior to insulation being applied.

.4 System tests to be with equipment connected. Trap diaphragms to be removed and systems flushed prior test.

.5 Make good leaks, replace defective parts, flush out defective section, re-test and adjust until system functions correctly.

.6 Prior to Owner's takeover, systems to be balanced and ready for operation, with traps, strainers, drip legs, etc. cleaned.

3.5 EXPANSION JOINTS

.1 Install in accordance with manufacturer's instructions.

.2 Contractor to calculate pipe expansion based on the temperature rise listed and the distance between anchors as per the final site conditions. Select expansion compensators based on this calculated expansion distance.

.3 Anchor pipe to building structure where indicated and as required. Provide pipe guides so movement is directed along axis of pipe only. Erect piping such that strain and weight is not on cast connections or apparatus.

.4 Provide support and equipment required to control expansion and contraction of piping. Provide loops, pipe offsets, and swing joints, or expansion joints where required.

.5 Use guides on each side of expansion joints and compensators. Support from structural brackets.

.6 When expansion joints are installed at ambient temps. higher than minimum system operating temp. they shall be precompressed prior to installation, to allow for eventual contraction of piping.

3.6 ANCHORS

.1 Provide where noted on horizontal piping. Fit anchors on vertical piping to ensure that water or air is not trapped. Fabricate from channels and angles to suit location; brace to building structure.

3.7 CHEMICAL TREATMENT

.1 General

.1 Provide services of Veolia Water Treatment Specialist to supply chemicals, accessories and to conduct water treatment analysis; supervise installation of equipment and initial start-up of treatment procedures. If, from analysis, other treatment is required, provide same but submit proposed treatment to Consultant for approval prior to start-up of any system.

.2 Supplier to provide training in use of test equipment, establish treatment ranges, and provide log sheets with training in their use.

.2 Supplier to make regular call-backs to check on procedures being followed and report each call in writing to Consultant, Section 23 21 13 and Section 23 22 13 and Owners during first year's operation. Call-backs to be in accordance with following:

.1 Hot water heating systems - at the beginning, mid-point and end of the heating season.

.2 Supplier to guarantee all mechanical equipment provided to be free of defects for one year from date of start-up.

.3 Supplier to witness cleaning of all strainers.

.3 Hot Water Heating Systems Cleanout

.1 Systems to be cleaned out prior to addition of water treatment. Pump on each system may be used to circulate cleaning solution provided that pumps are dismantled and inspected, worn parts repaired with new gaskets and seals installed. Submit used seals.

.2 Balancing valves on pump discharges to be regulated to ensure against operating pumps out of their normal operating range.

.3 Provide drain connections to allow for drainage of system in one hour. Pipe drains to sanitary sewer.

.4 Install totalizing water meter(s) and record capacity in each system.

.5 After all components of the piping system have been pressure tested and proven to be in full operational condition and leak free, flush entire system with fresh, clean make-up water to remove loose mill scale, sediment and construction debris.

.6 After initial flushing has been completed, clean all strainer screens throughout the building.

.7 Cleaner to be introduced and circulated from 48 to 72 hours and removed from system by Contractor by dumping system.

.8 Add cleaner to closed systems at concentration levels recommended by the Water Treatment Specialist.

.9 Water treatment specialist Veolia to monitor system pH and add Ferroquest FQ7102 neutralizer as required, to maintain neutral pH bring pH into the 6.5-7.0 range.

.10 Hot water heating systems: apply heat while circulating, if possible raise temperature up to 60C and maintain for 48 hours.

.11 After cleaning, drain system as rapidly as possible.

.12 Flush each system until conductivity of water in system is back to conductivity of make-up water. If gland packed or mechanical seal pumps of permanent system are used during cleaning period, replace packing and mechanical seals with new material.

.13 All strainers to be cleaned by Section 23 21 13 and Section 23 22 13

.14 System to be refilled and required amount of chemical treatment added to provide immediate protection against corrosion.

.15 Supplier to conduct conductivity tests before, during, and after cleaning each system, and report procedures followed and conductivity readings to Consultant and Contractor in writing.

.16 System not to be used until cleaning procedure has been carried out and supervised by Supplier.

.4 Hot Water Heating Systems Treatment

.1 Introduce corrosion inhibitor through by-pass pot feeders installed across circulating pumps of each system under supervision of and according to drawings submitted by Supplier.

END OF SECTION