HALTON REGION
SPECIAL NOTICE:

TRANSITION TO THE CCDC 2 (2020) FORM OF CONTRACT

HALTON REGION HAS TRANSITIONED TO THE CCDC 2(2020) FORM OF CONTRACT. PLEASE NOTE THE FOLLOWING:

The Region's contract documents have changed – The Region has adopted the CCDC 2 (2020) Stipulated Price Contract with new Supplementary Conditions, and correspondingly updated its tender and proposal documents. The key project-specific details can be found in the Agreement Between Owner and Contractor (Attachment 'C') and the Agreement Term Sheet, located in Appendix 1 of the Supplementary Conditions (Attachment 'D').

The Region's bonding requirements have changed for projects using the CCDC 2 (2020) Stipulated Price Contract – Bonds will only be required where the Total Bid Price is equal to or greater than $500,000.00. For those projects, the Region now requires Performance Bonds with a coverage limit of fifty percent (50%) of the Contract Price (**plus HST**), rather than one hundred percent (100%). See Section 1.30 – Performance Security, Labour & Material Security for details.

The Region's insurance requirements have changed for projects using the CCDC 2 (2020) Stipulated Price Contract – Insurance requirements can be found in the Supplementary Conditions SC-110 and SC-111, as well as Appendix 3 to the Supplementary Conditions (Attachment 'D').

THE REGIONAL MUNICIPALITY OF HALTON

on behalf of

HALTON COMMUNITY HOUSING CORPORATION

REQUEST FOR PROPOSALS

FOR

ROTARY GARDENS POWER AND HVAC UPGRADES

PROPOSAL #: P-1260-24

BIDS SHALL BE SUBMITTED VIA THE BIDDING SYSTEM AT
https://haltonregion.bidsandtenders.ca

******* ELECTRONIC SUBMISSIONS ONLY *******

TABLE OF CONTENTS

Schedules
Schedule 1 – Technical Specifications and Drawings
Schedule 2 – Contractor Checklist
Schedule 3 – Designated Substance and Detailed Asbestos Building Materials Survey Report
Schedule 4 – Asbestos Assessment Rotary Gardens

Attachments
Attachment A – Bid Bond (CCDC 220 – 2002)
Attachment B – Agreement to Bond
Attachment C – Agreement Between Owner and Contractor (CCDC 2 – 2020 Stipulated Price Contract)
Attachment D – Supplementary Conditions (to CCDC 2 - 2020)

Section 4: Forms

New/Change Vendor and Electronic Funds Transfer Application
Sample Certificate of Insurance
Halton Region Vendor Code of Conduct

SECTION 1: SUBMISSION INSTRUCTIONS

1.1 Definitions

1.1.1 The following definitions shall apply throughout the Request for Proposals:

a. "Act" means the Construction Act, R.S.O. 1990, CHAPTER C.30, as amended from time to time.

b. "Addendum" or "Addenda" means a change, addition or to respond to questions in relation to the Request for Proposals document.

c. "Agreement" means the executed Agreement between HCHC (defined below) and the Contractor for the performance of the Work, included hereto as Attachment "C".

d. "Award" means the Award of the Contract by HCHC to one (1) or more Proponents based on the procurement solicitation evaluation criteria.

e. "Bidding System" or "Public Procurement Website" means the Region's publicly accessible procurement website for issuing bid solicitations and/or receiving online bid submissions and posting bid results.

f. "Bid Security" means the security submitted by the Proponent with its Proposal, which provides financial protection to the Region and HCHC should the successful Proponent not enter into the Contract.

g. "Board" means the Board of Directors of the Halton Community Housing Corporation.

h. "Closing Date" and "Closing Time" means the deadline for submission of Proposals, as indicated in Section 1.4.1 of the Submission Instructions.

i. "Contract" means the undertaking by the parties to perform their respective duties, responsibilities and obligations as prescribed in the Contract Documents and represents the entire Agreement between HCHC and the Contractor for the supply of Goods, Services and/or Construction, or a combination thereof.

j. "Contract Documents" consist of those documents listed in Article A-3 – CONTRACT DOCUMENTS.

k. "Contract Price" means the amount stipulated in Article A-4 – CONTRACT PRICE of the Agreement.

l. "Contractor" means the successful Proponent in respect of whose Proposal an Award is made.

m. "Construction" means any construction, reconstruction, demolition, repair or renovation of a building, structure, road or other engineering or architectural work.

n. "Construction Equipment" means all machinery and equipment, either operated or not operated, that is required for preparing, fabricating, conveying, erecting, or otherwise performing the Work (as defined below) but is not incorporated into the Work.

o. “Consultant” means the person, partnership, or corporation designated by the Owner to be the Owner's representative for the purposes of administering the Contract and may also be referred to herein as the Contract Administrator.

p. **“**Cost Proposal” means the Schedule of Prices completed by the Proponent for the Work as stipulated in the Technical Specifications and submitted back to the Region in its entirety through the Bidding System.

q. “Designated Sourcing Representative” means the Regional staff in Supply Chain Management responsible for the entire process until a contract is awarded by the Region.

r. “ECA” means the Electronic Commerce Act, 2000, S.O. 2000, c. 17.

s. “Goods” means all of the articles, Products (as defined below), supplies, commodities, raw materials, equipment, machinery, appurtenances and/or other materials including incidental services that the Contractor is required to supply to HCHC under the Agreement.

t. “HCHC” means Halton Community Housing Corporation.

u. “HST” means tax payable under the *Excise Tax Act*, R.S.C. 1985, c.E-15 or any tax that replaces the HST.

v. “Irrevocability Period” means the duration in which the Proposal shall remain irrevocable and open to Award by the Owner and is the duration indicated in the Section 1.11 – Award and Irrevocability of Proposal.

w. “Letter of Intent” means the letter sent by the Region to a Proponent, on behalf of HCHC, following the proposal evaluation and selection process, indicating HCHC’s intent to Award, subject to Senior Management and/or Board approval, the Proponent’s fulfilment of the requirements of the Request for Proposals, and formal execution of the Agreement between the Proponent and HCHC.

x. “Notice of Award Letter” means the letter sent by the Region, on behalf of HCHC, to the selected Proponent, confirming the Award of the Contract and will include direction with respect to the commencement of the Work.

y. “Owner”, “Region”, “Halton” and “Halton Region” means The Regional Municipality of Halton.

z. “Plan Taker” means one who downloads documents associated with the bid opportunity via the Bidding System.

aa. “Product” or “Products” means material, machinery, equipment, and fixtures forming part of the Work, but does not include Construction Equipment.

bb. “Proper Invoice” means a proper invoice, submitted by the Contractor, as defined in section 6.1 of the Act and HCHC’s Contract Documents.

cc. “Proponent” or “Bidder” means a Vendor participating in this Request for Proposals by submitting a Proposal.

dd. “Proposal” or “Bid” means the submission from a Proponent in response to this Request for Proposals, including the Technical Proposal and Cost Proposal. Any reference in the RFP to Bid shall be deemed to refer to Proposal.

ee. "Purchase Order" means a written order, including its terms and conditions, issued by the Region for the supply of Goods, Services and/or Construction, or a combination thereof.

ff. "Ready-for-Takeover" shall have been attained when the conditions set out in paragraph 12.1.1 of GC 12.1 – READY-FOR-TAKEOVER have been met, as verified by the Consultant pursuant to paragraph 12.1.4.2 of GC 12.1 – READY-FOR-TAKEOVER.

gg. "Regional Representative" or "HCHC Representative" means the Region's employee who has been designated to perform supervisory functions with respect to the Agreement.

hh. "Request for Proposals" or "RFP" means a procurement solicitation whereby the Region evaluates Proposals on both technical/qualitative and cost merits, in accordance with the evaluation criteria described in the solicitation document and may include negotiations.

ii. "Schedule of Prices" means the schedule supplied as part of the RFP for the purposes of inputting pricing for the Work, which shall be completed by the Proponent and submitted back to the Region in its entirety through the Bidding System. Any reference in the Contract Documents to 'Bid Form' shall be deemed to refer to the Schedule of Prices.

jj. "Services" means a non-physical, intangible product resulting from a Vendor's performance that cannot be stored or transported and that comes into existence at the time it is bought or consumed.

kk. "Technical Proposal" means a Proponent's completed Technical Proposal and all materials submitted with it; more specifically, the technical and qualitative information included in the PDF document upload of the technical proposal submission to the Bidding System.

ll. "Technical Specifications" means that portion of the Contract Documents wherever located and whenever issued, consisting of the written requirements and standards for the Goods and Services necessary for the performance of the Work.

mm. "Total Bid Price" means the price stipulated in the Schedule of Prices in the Bidding System.

nn. "Vendor" means any legal person or entity providing or interested in providing Goods, Services and/or Construction, including suppliers, contractors, consultants and other service providers.

oo. "Vendor Code of Conduct" means the Region's Vendor Code of Conduct as available on the Region's website at www.halton.ca.

pp. "Vendor Performance Management Policy" means the policy outlining the Region's process for evaluating Vendor performance of Contracts and the consequences resulting from "Unacceptable" performance, as may be amended from time to time.

qq. "Work" has the meaning indicated in the Contract Documents.

1.2 Any Communications

1.2.1 Any Proponent that finds omissions from or discrepancies in this bid document, have questions, or be in doubt as to the meaning of any part of the bid document, shall immediately notify the Region in writing through Halton Region's Public Procurement Website (https://haltonregion.bidsandtenders.ca) by using the "Submit a Question" link associated with

this bid request. Questions or clarification requests received by telephone or e-mail will not be accepted.

Questions are to be submitted no later than Wednesday, November 27, 2024, at 4:00 p.m. ET.

1.2.2 The Region reserves the right to neither accept nor consider any questions received after 4:00 p.m. on the date specified above. The Region will review all questions received and prepare a response that is made available as an Addendum, if necessary, to all Plan Takers.

1.2.3 It will be the Proponent's responsibility to clarify with the Region any questions arising from this bid document or any matter they consider unclear in accordance with this section before submitting their Proposal. Under no circumstances shall Proponents rely upon any information or instructions from the Region, its employees, or its agents, unless the information or instructions are provided in writing in the form of an Addendum.

1.2.4 A Proponent or its representative(s) will only communicate with the Designated Sourcing Representative for the Bid. A Proponent or its representative (s) shall not communicate with any other Regional staff or elected officials from the time of issuance of this bid document until the final Award. The Region reserves the right to disqualify any Proponent who contravenes this prohibition.

1.2.5 A Proponent or its representative(s) shall not threaten, harass nor intimidate staff, elected officials or any other supplier from bidding on a Regional solicitation or performing a HCHC contract. The Region reserves the right to disqualify any Proponent who contravenes this prohibition.

1.3 Registered Plan Taker

1.3.1 Bid documents are available online via the Bidding System at https://haltonregion.bidsandtenders.ca. A vendor that subscribes to the Bidding System can login to their account to purchase and download the bid document(s) without the preview watermark. A vendor that does not subscribe to the Bidding System may choose to purchase a one-time only download of this Bid opportunity. Bid documents are only available via the Bidding System and will not be provided in any other format.

1.3.2 All Proponents shall have a Bidding System account and be registered as a Plan Taker for this bid opportunity, which will enable the Proponent to download the bid document without the watermark preview, to receive Addenda/Addendum email notifications, download Addendums and to submit their Proposal electronically through the Bidding System. To ensure receipt of the latest information and updates via email regarding this bid, the onus is on the Proponent to create a Bidding System account and register as a Plan Taker for the bid opportunity.

1.3.3 Proponents must be registered as a Plan Taker for this bid opportunity on the Bidding System in order to submit a Proposal. Should the Region receive a Proposal that is subsequently found to be from a Proponent that is not a registered Plan Taker, the Region reserves the right to remove the Proposal from further consideration.

1.4 Electronic Bid Submissions Only

1.4.1 Proposals shall be submitted via the Bidding System no later than the Closing Date and Closing Time as follows:

THURSDAY, DECEMBER 5, 2024, AT 2:00 P.M. ET

1.4.2 **Only Proposals submitted via the Bidding System will be accepted.** Proposals submitted by any other method or format will be automatically rejected. It is the sole responsibility of each Proponent to make sure that their Proposal is delivered and received by the Bidding System by the Closing Date and Closing Time. Proposals received after the specified Closing Date and Closing Time will not be accepted by the Bidding System.

1.4.3 There will not be a public Bid opening. Results will be posted on the Bidding System at https://haltonregion.bidsandtenders.ca.

1.4.4 Proponents are cautioned that the timing of their Proposal submission is based on when the Proposal is successfully received by the Bidding System, not when a Proposal is submitted by a Proponent, as transmission can be delayed for a number of reasons, including the file transfer size, transmission speed, etc.

1.4.5 The Region and/or HCHC shall not be liable for any costs, expenses, loss or damage resulting from any technical difficulty with the Bidding System, including, without limitation, computer system failures of either the Proponent or the Region's Bidding System service provider, a power failure, delays caused by internet/network traffic and/or failure of any computer system element.

1.4.6 For the above reasons, the Region recommends that Proponents allow sufficient time to upload their Proposal and attachment(s) (if applicable). The Closing Date and Closing Time shall be determined by the clock used by the Bidding System.

1.4.7 The Region also encourages Proponents to take advantage of the Bidding System feature that allows Proponents to view their uploaded documents prior to submission of their Proposal. Proponents are solely responsible for ensuring that they can access the Bidding System and submit their Proposal before the Closing Date and Closing Time.

1.4.8 The Bidding System will send a confirmation email to the Proponent advising that their Proposal was submitted successfully. If you do not receive a confirmation email, contact technical support at Bids & Tenders via telephone at 1-800-594-4798 or email: support@bidsandtenders.ca.

1.5 Addendum

1.5.1 Should a Proponent find omissions from or discrepancies in any Contract Documents or be in doubt as to the meaning or any part of the Contract Documents, the Proponent shall immediately notify the Region in writing.

1.5.2 Through Addendum, the Manager, Strategic Sourcing may:

a. revise, delete, add to or substitute any part of the Request for Proposals document;

b. extend the Closing Date; or

c. provide a written explanation or interpretation of the Request for Proposals document.

1.5.3 No oral explanation or interpretation by the Region or HCHC shall modify any of the requirements or provisions of the Request for Proposals document.

1.5.4 Proponents are advised that Addenda will be posted at https://haltonregion.bidsandtenders.ca under the applicable bid call.

1.5.5 The Bidding System will attempt to notify each Plan Taker by email, of the issuance of an Addendum to the bid document. The Bidding System will use the email address supplied by the Plan Taker at the time of purchase of the bid document. The Region and/or HCHC will not be responsible for missing or invalid email addresses.

1.5.6 It is the Proponent's responsibility to view and/or download all applicable Addenda prior to submitting a Proposal. Addenda form part of the Request for Proposals document and must be taken into consideration when submitting a Proposal.

1.5.7 Proponents shall acknowledge receipt of any Addenda when submitting their Proposal through the Bidding System. Proponents shall check a box for each Addendum/Addenda and any applicable attachments that have been issued before a Proponent may submit their Proposal.

1.5.8 It is the responsibility of the Proponent to ensure they have received all Addendum / Addenda that have been issued. Proponents should check online at https://haltonregion.bidsandtenders.ca prior to submitting their Proposal to confirm all Addendum / Addenda have been received.

1.5.9 If a Proponent submits their Proposal at any time prior to the Closing Date and Closing Time and an Addendum/Addenda is subsequently issued by the Region after the submission of the Proposal, the Bidding System will automatically **WITHDRAW** the Proposal submission and change the Bid submission to an **INCOMPLETE STATUS.** A Proposal with an incomplete status will **NOT be accepted by the Region**. The withdrawn Proposal can be viewed by the Proponent in the **"MY BIDS"** section of the Bidding System. The Proponent is solely responsible to:

a. Make any required adjustments to their Proposal; and

b. Acknowledge the Addendum/addenda; and

c. Ensure that the re-submitted Proposal is successfully received by the Bidding System no later than the Closing Date and Closing Time.

1.6 Withdrawal or Revision of Proposals

1.6.1 Proponents may edit or withdraw their Proposal submission through the Bidding System prior to the Closing Date and Closing Time. If the Proponent wishes to re-submit a Proposal, the Proponent is solely responsible to:

a. Make any required adjustments to their Proposal; and

b. Acknowledge the Addendum/Addenda; and

c. Ensure the re-submitted Proposal is successfully received by the Bidding System no later than the Closing Date and Closing Time.

1.6.2 Requests to withdraw Proposals received by the Bidding System will not be considered after the Closing Date and Closing Time.

1.6.3 Irregularities in any Proposal shall be resolved in accordance with Regional policies and procedures governing bid irregularities.

1.7 Site Conditions and Site Meeting(s)

1.7.1 Proponents are responsible to conduct any site examinations deemed necessary by the Proponent for the proper preparation of a Bid and/or to make themselves aware of all conditions that may affect the Work. Nothing in this Request for Proposals shall relieve the

Proponents from undertaking all investigation and clarification on all matters related to this Request for Proposals. No allowance will be made for additional costs nor will any claim be considered in connection with conditions or circumstances that could have been reasonably ascertained by the Proponents had reasonable efforts been made prior to the Closing Date and Closing Time.

1.7.2 If a site meeting(s) is required, details will be provided in Section 2 Terms of Reference.

1.7.3 General Instructions for Site Meetings:

1.7.3.1 The site meeting will begin promptly at the designated time. Proponents are encouraged to arrive prior to the time indicated in order to sign in.

1.7.3.2 Attendees will be provided with an overview of the project. It is the responsibility of each Proponent to conduct a sufficient investigation of the site(s) and of the work and obtain all required information about local conditions to be met with during the work prior to submitting their Proposal. The Proponents shall make their own estimates and measurements of the facilities and difficulties that may be encountered. Proponents may not claim at any time after submission of the Proposal that there was any misunderstanding of the terms and conditions of the Contract relating to site conditions evident or apparent during the Bid period.

1.7.3.3 The Region and/or HCHC will not be held responsible for a Proponent's failure to obtain such information. The Region and/or HCHC assume no responsibility and will not pay additional costs for any omissions in the Proposal submission as a result of site-specific conditions that Proponents could have seen if they visited the site(s).

1.7.3.4 It is the responsibility of the Proponent to verify actual site conditions and measurements. The price submitted is for the completed work, including all items which may not have been mentioned but are required to complete the scope of work.

1.7.4 **Mandatory Site Meeting(s) Instructions (where applicable):**

1.7.4.1 Where there is a mandatory site meeting(s), Proponents who fail to attend and register their attendance at the mandatory site meeting(s) will be disqualified from submitting a Proposal.

1.7.4.2 At the Region's discretion, a Proponent that arrives late to the mandatory site meeting(s) may be disqualified from submitting a Bid.

1.7.5 **Non- Mandatory Site Meeting(s) Instructions (where applicable):**

1.7.5.1 Where there is a non-mandatory site meeting(s), Proponents are not required to attend the site meeting(s) in order to submit a Proposal. However, the Region strongly recommends that Proponents attend the site meeting(s) in order to familiarize themselves with the existing conditions prior to submitting their Proposal.

1.8 Schedule of Prices and Total Bid Price

1.8.1 Proponents shall complete and submit the Schedule of Prices through the Bidding System.

1.8.2 All prices shall be Freight on Board (F.O.B.) destination; freight prepaid and included unless otherwise specified.

1.8.3 The Total Bid Price shall be in Canadian Dollars and shall include the furnishing of all materials, supplies and equipment and the provision of all labour, construction tools and equipment, utility and transportation services necessary to perform and complete all the Work required under the Contract, including all miscellaneous Work, whether specifically included in the Contract Documents or not. Goods and Services rendered will be billed to actual expenses, in accordance with the rates as Bid.

1.8.4 The Total Bid Price does not include Harmonized Sales Tax (HST).

1.8.5 It is the intention of the Contract Documents to provide finished Work. Any items omitted therefrom which are clearly necessary for the completion of the Work or its appurtenances shall be considered a portion of the Work though not directly specified and/or shown or called for in the Contract Documents and shall be included in the Total Bid Price.

1.8.6 Proponents shall complete all items requiring input in the Schedule of Prices, unless otherwise specified in the Contract Documents.

1.9 Ontario Harmonized Sales Tax (HST)

1.9.1 The Contractor will be required to provide the Region with its HST Registration Number and indicate the applicable HST on each progress payment certificate and Proper Invoice provided to the Region and HCHC.

19.2 Where a change in Canadian Federal or Provincial taxes occurs after a Closing Date, the Region shall adjust progress payment certificates to account for the exact amount of the tax change involved.

1.10 Vendor Code of Conduct

1.10.1 The Vendor Code of Conduct, as included in this Request for Proposals document, sets out the principles applicable to vendors that wish to establish and maintain a business relationship with the Region and HCHC.

1.10.2 The Region and HCHC intend to do business with Proponents that demonstrate solid business integrity that aligns with the Region and HCHC's core values and high standards of ethical behaviour expected by the Region and HCHC. The Vendor Code is not to be read in lieu of, but in addition to the obligations as set out in any agreements with the Region and HCHC. Proponents are responsible to familiarize themselves with the Vendor Code of Conduct and comply with it. Proponents are to complete, sign and return the Vendor Code of Conduct Acknowledgement Form with their Proposal submission.

1.11 Award and Irrevocability of Proposal

1.11.1 HCHC shall have ninety (90) days from the Closing Date to make an Award and the Proposal shall be irrevocable during this time.

1.11.2 Extension of Irrevocability Period

a. In the event HCHC is unable to make an Award within the Irrevocability Period, the Region shall request a formal extension in writing from one or more Proponents.
b. Subject to agreement by the Proponent(s) in writing, the Irrevocability Period shall be extended and the bid document shall be considered automatically amended to reflect the revised Irrevocability Period.

1.11.3 The Region, on behalf of HCHC, shall notify all Proponents of the Award by publicly posting it in the same manner that this RFP was originally posted.

1.12 Privilege Clause

1.12.1 The Region and/or HCHC shall have the right to reject any or all Proposals. The Proposal with the lowest price will not necessarily be accepted and the Region and/or HCHC reserve the right to accept any portion of a Proposal or Proposals.

1.12.2 The Region, in its sole discretion, may reject a Bid from a Suspended Vendor and/or a Bid that includes a Suspended Vendor as a sub-contractor, in accordance with the Vendor Performance Management Policy.

1.12.3 The Manager, Strategic Sourcing may cancel the Request for Proposals at his/her sole discretion.

1.12.4 In addition to any other right expressed or implied in this RFP, the Region and/or HCHC reserve the right to:

a. make public the names of any or all Proponents and members of a Proponent's team;

b. request written clarification of any element of any Proposal from any Proponent and incorporate a Proponent's response to that request into the Proponent's Proposal;

c. adjust technical scores based on the results of interviews, references, site visits, demonstrations etc. at the discretion of the Region, which may result in the Cost Proposal being removed from further consideration;

d. clarify or verify with any Proponent or with a third party any information set out in a Proposal;

e. check references other than those provided by any Proponent;

f. disqualify or invalidate any Proposal that contains material misrepresentations or any other materially inaccurate or misleading information;

g. make changes, including substantial changes, to this RFP provided that those changes are issued by way of addenda;

h. if a single Proposal is received, reject the Proposal of the sole Proponent and cancel this RFP process or enter into direct negotiations with the sole Proponent.

1.13 Claims or Litigation

1.13.1 The Region and/or HCHC reserve the right, and in its absolute discretion after considering the criteria outlined in subsection 1.13.2, to reject a Proposal submitted by a Proponent if the Region and/or HCHC is engaged in a legal dispute including but not limited to a contractual claim and/or legal action against the Proponent, or, if the Proponent or any officer or director of the Proponent is engaged, either directly or indirectly through a corporation or personally, in a legal dispute, including but not limited to a contractual claim and/or legal action against the Region and/or HCHC, its elected representatives, appointed officers, or employees, in relation to:

a. any other Contract, Goods and/or Services and/or Construction;

b. any matter arising from the Region and/or HCHC's exercise of its powers, duties, or functions.

1.13.2 In determining whether or not to reject a Proposal the Region will consider;

a. whether the dispute and/or litigation is likely to adversely affect the Proponent's ability to work with the Region, HCHC, its consultants and representatives; or,

b. whether the Region and/or HCHC's experience with the Proponent indicates that the Region and/or HCHC is likely to incur increased staff and legal costs in the administration of the contract if it is Awarded to the Proponent; or,

c. whether the Proponent has been convicted of a criminal act against the Region or one of its local boards or corporations; or,

d. whether the Proponent has failed to satisfy an outstanding debt to the Region, including *Provincial Offences Act* fines, or one of its local boards or corporations; or,

e. there are reasonable grounds to believe it would not be in the best interests of the Region and/or HCHC to enter into a contract with the Proponent.

1.14 Proposal Costs

1.14.1 The Region and/or HCHC will not be responsible for any costs incurred by a Proponent in preparing and submitting a Proposal, attending an interview, giving a demonstration or supplying a sample.

1.15 Intellectual Property

1.15.1 All reports, plans, designs, and other documents to be produced by the successful Proponent to this Request for Proposals shall, on submission to the Region and/or HCHC, become the property of the Region and/or HCHC.

1.16 Digital Drawings

1.16.1 Should a Proponent choose to print any of the drawings supplied by the Region and/or HCHC in a PDF format, to preserve the scale of the prints, the Proponent must disable all page scaling options during printing. The Region and/or HCHC assume no responsibility whatsoever for the Proponent's failure to properly print, including the failure to print to the proper scale, any drawings supplied by the Region.

1.16.2 It is the Proponent's sole responsibility to verify that all PDF drawings are printed without PDF scaling enabled by verifying the final PDF prints with the associated drawing scale references in the applicable drawings title block.

1.17 Green Procurement

Intentionally left blank.

1.18 Ontario Regulation 191/11 – Integrated Accessibility *Standards*

1.18.1 Pursuant to *Ontario Regulation 191/11 – Integrated Accessibility Standards*, under the *Accessibility for Ontarians with Disabilities Act, 2005*, the Region is required to incorporate accessibility design, criteria and features when procuring or acquiring goods, services or facilities, except where it is not practicable to do so.

1.18.2 When determining which bid will result in an Award the Region may, in its sole discretion and

without limiting any of its other express or implied rights regarding the discretion to make an Award, consider whether the goods, services or facilities to be provided incorporate accessibility design, criteria and features.

1.19 Electronic Payment Deposit

1.19.1 The Region strongly encourages the Proponent to complete the New/Change Vendor and Electronic Funds Transfer Application (the "Form") included in the bid document. Proponents are not to include the Form with their bid submission. The successful Proponent(s) is to provide the Form as part of the documentation required prior to bid Award.

1.19.2 If during the contract term, there is any change to the direct deposit information, the Supplier shall submit a new Form, which must be authorized by a signing officer, and someone who has the ability to bind the corporation. The Region will verify any and all changes to the banking information with the Supplier prior to making any changes on the Region's end.

1.20 Non-Resident Withholding Tax

1.20.1 Should HCHC make an Award to a non-resident Vendor, HCHC shall under the Income Tax Act and the Income Tax Regulations, C.R.C., c.945, all as amended from time to time, withhold 15% (fifteen percent) from payments of fees, commissions, or other amounts paid to non-resident Vendors, in respect of services rendered in Canada, in accordance with the above, for services rendered in Canada. HCHC is not required to withhold this amount under subsection 105(1) of the Regulations, if the non-resident Vendor obtains a waiver certificate from the Canada Revenue Agency prior to the commencement of the Contract.

1.21 Freedom of Information

1.21.1 The information provided in response to this Request for Proposal is collected in accordance with Halton Community Housing Corporation's Purchasing By-law No. 4-15, as amended, and will be used for all purposes related to Awarding the RFP and administering By-law No. 4-15, as amended. The Proponent acknowledges that the Region and HCHC is subject to the *Municipal Freedom of Information and Protection of Privacy Act*, R.S.O 1990, c.M.25, as amended ("MFIPPA") and as a result the contents of any Proposal submitted, with the exception of personal information, may be disclosed if the Region and/or HCHC receives a request for it under MFIPPA. Proponents have the right to identify other portions of their Proposals they consider confidential although doing so will not guarantee that the information will not be disclosed if requested under MFIPPA.

1.22 Halton Region Co-Operative Purchasing Group

1.22.1 The Region is a member of the Halton Co-operative Purchasing Group ("HCPG"). Refer to the Halton website at halton.ca for a list of participating agencies.

1.23 Vendor Performance Management Policy

1.23.1 The Vendor Performance Management Policy (the "Policy") shall not apply to this Contract, however, for clarity, Proponents are required to adhere to the requirements set forth in Section 1.24.1 below.

1.23.2 The Policy may be amended from time to time.

1.23.3 The Policy and the applicable evaluation form can be accessed on the Region's website at ww.halton.ca.

1.24 Subcontractors

1.24.1 Proponents must ensure they and any subcontractors they retain are in good standing with the Region and HCHC, in accordance with the Vendor Performance Management Policy. It is the responsibility of the Proponent to review the Suspended Vendor List on www.halton.ca prior to submitting a Proposal or retaining any subcontractors.

1.25 Contract Execution

1.25.1 The Agreement to be executed by the parties shall be in the form provided in Attachment "C". This Agreement is a template only; the necessary information will be inserted into the Agreement after completion of the evaluation and selection process and provided to the highest ranked Proponent. A Letter of Intent and the Contract Documents will be sent to the highest ranked Proponent. The Proponent shall fully execute and return the Contract Documents together with the applicable Bonds (if required), Certificates of Liability Insurance, Workplace Safety and Insurance, New/Change Vendor & Electronic Funds Transfer Application (if required), and any other required documents to the Region within ten (10) calendar days of the date of receipt of the Letter of Intent, failing which the Region reserves the right to retain the Proponent's Bid Security and not Award to the Proponent. The aforementioned documents shall be completed to the satisfaction of the Region and HCHC with no errors and omissions.

1.25.2 The Letter of Intent does not constitute Award of the Contract. Award is subject to Senior Management and/or Board approval, the Proponent's fulfilment of the requirements of the Request for Proposals, such as the submission of the required documentation as set out in the Letter of Intent, which may include but is not limited to those items referenced in Section 1.25.1, and formal execution of the Agreement between the Proponent and HCHC.

1.25.3 In the event that HCHC, in its sole discretion, allows an extension of time for the Proponent to submit the required documentation referenced in Section 2.7, the Proponent shall not be entitled to an extension of Contract time or delay claims as a result of the Proponent's delay in submitting completed documentation.

1.26 Proper Invoice Requirements

1.26.1 The Contractor will be required to comply with the prompt payment provisions pursuant to Part I.1 of the Act and the Proper Invoice requirements set out in the Contract Documents.

1.27 Interim Adjudication

1.27.1 The Contractor will be required to comply with the construction dispute interim adjudication provisions pursuant to Part II.1 of the Act and the Contract Documents.

1.28 Key Construction Milestones

1.28.1 Refer to Section 2.3.1 for key construction milestones including the commence work date, the Ready-for-Takeover date, and the completion date.

1.29 Bid Security

1.29.1 Proponents shall upload to the Bidding System the following: Bid Security in the amount of no less than **5 (five) percent of the Total Bid Price plus HST** in the following form:

a. A **digital bid bond** in an electronically verifiable and enforceable (e-Bond) format, in the form CCDC 220 – 2002 naming "**Halton Community Housing Corporation**" as obligee and issued by a surety licensed to conduct surety and insurance business in Canada or in Ontario, in the amount set out in Section 1.29.1. **The digital bid bond form is attached hereto as Attachment "A".**

b. The version submitted by the Proponent must be verifiable by the Region with respect to the totality and wholeness of the bond form, including: the content; all digital signatures; all digital seals; with the surety, or an approved verification service provider of the surety.

c. The version submitted must be viewable, printable and storable in standard electronic file formats compatible with the Region, and in a single file. Allowable formats include pdf.

d. The verification may be conducted by the Region immediately or at any time during the life of the bond and at the discretion of the Region with no requirement for passwords or fees.

e. The results of the verification must provide a clear, immediate and printable indication of pass or fail regarding item 1.29.1, b.

1.29.2 A scanned PDF copy of bonds, original certified cheque, bank draft, money order or any other format other than a digital bid bond is not acceptable and shall be rejected.

1.29.3 A digital bid bond failing the verification process will NOT be considered to be valid.

1.29.4 A digital bid bond passing the verification process will be treated as original and authentic.

1.29.5 Proponents shall upload their Bid Security to the Bidding System, labelled as **"Digital Bid Bond".** All instructions and details for assessing authentication shall be included with the digital bid bond uploaded in the Bidding System.

1.29.6 The digital bid bond will not be returned to the Proponent.

1.29.7 The Bid Security shall be valid and not expire for at least the duration of the Irrevocability Period. In the event the Irrevocability Period is extended in accordance with Section 1.11.2, the Proponent shall secure from its surety an extension of the Bid Security and provide evidence of same, which may be in the form of a rider to the Bid Security or some other form of written communication from the surety.

1.30 Performance Security, Labour & Material Security

1.30.1 *Agreement to Bond*

a. Proponents shall upload to the Bidding System evidence that if awarded the Contract the Proponent will provide the **performance bond** required by the Contract. Such evidence shall be in the following form:

i. Where the Total Bid Price is equal to or greater than $500,000, a **digital agreement to bond** in an electronically verifiable and enforceable (e-Bond) format issued by a surety licensed to conduct surety and insurance business in Canada or in Ontario for a **performance bond** in the Form 32 Performance Bond under section 85.1 of the Act, in the amount of fifty percent (50%) of the Total Bid Price (plus HST). The agreement to bond shall remain valid and not expire for at least the duration of the Irrevocability Period. In the event the Irrevocability Period is extended in accordance

with Section 1.11.2, the Proponent shall secure from its surety an extension of the agreement to bond and provide evidence of same, which may be in the form of a rider to the agreement to bond or some other form of written communication from the surety. **The digital agreement to bond form is hereto attached as Attachment "B".**

b. Proponents shall upload to the Bidding System evidence that if awarded the Contract the Proponent will provide the **labour & material payment bond** required by the Contract. Such evidence shall be in the following form:

   i. Where the Total Bid Price is equal to or greater than $500,000, a **digital agreement to bond** in an electronically verifiable and enforceable (e-Bond) format issued by a surety licensed to conduct surety and insurance business in Canada or in Ontario for a **labour & material payment bond** in the Form 31 Labour and Material Payment Bond under section 85.1 of the Act, in the amount of fifty percent (50%) of the Total Bid Price (plus HST). The agreement to bond shall remain valid and not expire for at least the duration of the Irrevocability Period. In the event the Irrevocability Period is extended in accordance with Section 1.11.2, the Proponent shall secure from its surety an extension of the agreement to bond and provide evidence of same, which may be in the form of a rider to the agreement to bond or some other form of written communication from the surety. **The digital agreement to bond form is included as Attachment "B".**

c. Proponents shall upload the digital Agreement to Bond described in Section 1.30.1, subsections a. and b., (collectively the "**Digital Agreement to Bond Performance Security and Labour & Material Security**") to the Bidding System, labelled as **"Digital Agreement to Bond"**. All instructions and details for assessing authentication shall be included with the digital agreement to bond uploaded in the Bidding System.

1.30.2 *Agreement to Bond Requirements*

a. The Digital Agreement to Bond Performance Security and Labour & Material Security shall be in the form as provided in Attachment "B" and shall include an express acknowledgement from the surety that a digitally signed and sealed performance bond and a digitally signed and sealed labour & material payment bond delivered to the Region by electronic means are:
   i. permitted under the ECA;
   ii. binding on the surety;
   iii. enforceable in accordance with their terms and enforceable in law;
   iv. for the purposes of any applicable statutory or common laws, regulations or guidelines, deemed to be originals hand delivered to the Region; and
   v. on the basis of the forgoing, the surety acknowledges and agrees that it would be estopped from and covenant not to challenge the enforceability of the bonds on the basis that each are digitally signed and sealed and delivered to the Region by electronic means.

b. The version submitted by the Proponent must be verifiable by the Region with respect to the totality and wholeness of the Digital Agreement to Bond Performance Security and Labour & Material Security form, including: the content; all digital signatures; all digital seals; with the surety, or an approved verification service provider of the surety.

c. The version submitted must be viewable, printable and storable in standard electronic file formats compatible with the Region, and in a single file. Allowable formats include pdf.

d. The verification may be conducted by the Region immediately or at any time during the life of the Digital Agreement to Bond Performance Security and Labour & Material Security and at the discretion of the Region with no requirement for passwords or fees.

e. The results of the verification must provide a clear, immediate and printable indication of pass or fail regarding subsection b. above.

f. A scanned PDF copy of an agreement to bond, or any other format other than a digital agreement to bond is not acceptable and shall be rejected.

g. An agreement to bond failing the verification process will NOT be considered to be valid.

h. An agreement to bond passing the verification process will be treated as original and authentic.

i. The Digital Agreement to Bond Performance Security, Labour & Material Security will not be returned to the Proponent.

1.30.3 *Performance and Labour & Material Payment Bonds*

a. Where the Contract Price is equal to or greater than $500,000, prior to the execution of the Contract, the highest ranking Proponent will be required to provide a Form 32 Performance Bond, under section 85.1 of the Act, in the amount of fifty percent (50%) of the Total Bid Price (including HST) ("**Performance Bond**"), and a Form 31 Labour and Material Payment Bond under section 85.1 of the Act in the amount of fifty percent (50%) of the Total Bid Price (including HST) ("**Labour & Material Bond**") to guarantee the faithful performance of the Contract.

b. The Performance Bond and Labour & Material Payment Bond shall be submitted to the Region in one of the following forms:
   i. Certified originals, issued in triplicate; or
   ii. An electronically verifiable and enforceable (e-Bond) format issued by a surety licensed to conduct surety and insurance business in Canada or in Ontario, that meets the requirements as outlined in Section 1.30.4, a.

c. The Performance Bond and Labour and Material Payment Bond shall be in the prescribed form under the Act, using the current version of the form. The necessary information will be inputted into the forms after the Closing Date and sent to the top ranked Proponent with the Letter of Intent. Changes to the prescribed forms under the Act will not be accepted.

1.30.4 *Digital Performance Bond and Labour and Material Payment Bond Requirements*

a. The Performance Bond and Labour and Material Payment Bond issued in an electronically verifiable and enforceable (e-Bond) format in accordance with Section 1.30.3, b., ii. shall be delivered by email transmission to Halton Region and shall satisfy and be subject to the following requirements:

   i. The version submitted by the Contractor must be verifiable by the Region with respect to the totality and wholeness of the Performance Bond and Labour & Material Payment Bond, including: the content; all digital signatures; all digital seals; with the surety, or an approved verification service provider of the surety.

ii. The version submitted by the Contractor must be viewable, printable and storable in standard electronic file formats compatible with the Region, and in a single file. Allowable formats include pdf.
iii. The verification may be conducted by the Region immediately or at any time during the life of the Performance Bond and Labour & Material Payment Bond and at the discretion of the Region with no requirement for passwords or fees.
iv. The results of the verification must provide a clear, immediate and printable indication of pass or fail regarding Section 1.30.4, a., i.
v. A scanned PDF copy of Performance Bond and Labour & Material Payment Bond or any other format other than the formats provided for in Sections 1.30.3, b., i, and ii. are not acceptable and shall be rejected.
vi. A Performance Bond and Labour & Material Payment Bond failing the verification process will NOT be considered to be valid.
vii. A Performance Bond and Labour & Material Payment Bond passing the verification process will be treated as original and authentic.

[END OF SECTION 1]

SECTION 2: TERMS OF REFERENCE

2.1 Introduction

2.1.1 Property Location

Rotary Gardens is a community located at 234-274 Woodside Drive and 1285-1299 Sedgewick Crescent, Oakville, Ontario (just south of Rebecca Street, between Third and Fourth Line). Rotary Gardens consists of twenty-eight (28), 1-storey apartments in a townhouse-style complex for older adults, separated into seven (7) buildings. The community is operated by Halton Community Housing Corporation and owned by The Regional Municipality of Halton. The complex was constructed in 1956. There are two (2) on-site common laundry rooms. Limited surface tenant parking is available, and visitors may park on the streets in accordance with Oakville by-law regulations.

2.1.2 Problem Statement

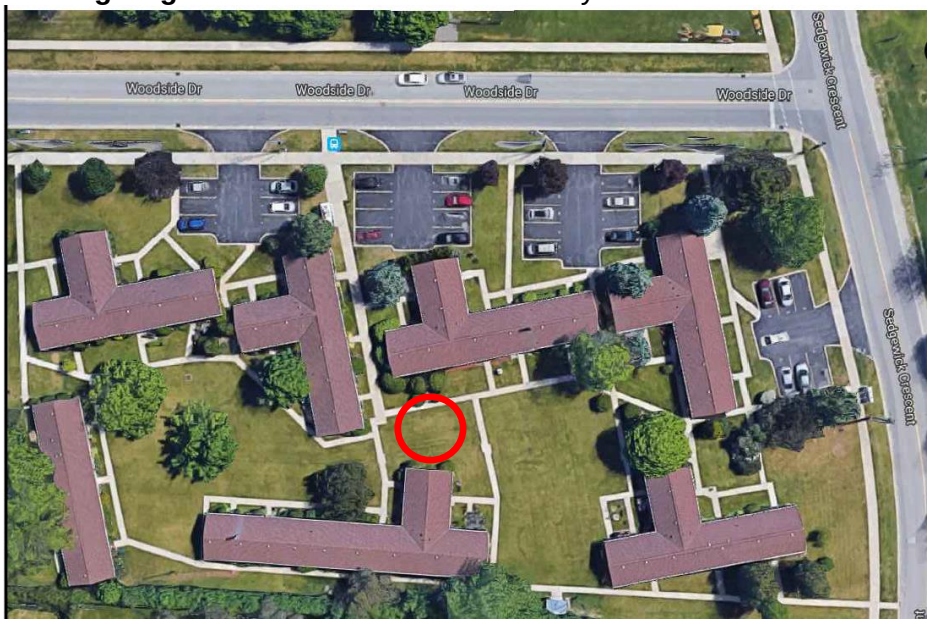
a. The Regional Municipality of Halton is upgrading the electrical service and performing upgrades to the existing heating/cooling systems.

b. The Regional Municipality of Halton on behalf of Halton Community Housing Corporation (HCHC) is seeking Proposals from qualified service providers to provide the Goods, Services and/or Construction detailed within the scope of work of this RFP. Upon Award of Contract, a purchase order shall be issued by the Halton Community Housing Corporation.

2.2 Non-Mandatory Site Meeting

2.2.1 A non-mandatory site meeting will be held at the location noted in the photo below (by the red circle) at the following date and time:

Address: 244-250 Woodside Drive
Date and Time: Tuesday, November 19, 2024, at 10:00 a.m. ET
Meeting Sign in location: In the Courtyard near the 244-250 Woodside Drive Block.



2.2.2 Personal Protective Equipment ("PPE") including hard hats, safety boots, safety vest and safety glasses will be required to enter the site. NOTE: Meeting attendees are responsible for providing their own PPE; it will not be provided by the Region.

2.2.3 The site meeting will begin promptly at the designated time. Attendees awaiting the site meeting are to wait outdoors at the designated location.

2.2.4 Questions will not be answered during the site meeting. Any and all questions are to be directed through the bids&tenders site in accordance with Section 1.2 "ANY COMMUNICATIONS".

2.2.5 Refer to Section 1.7 "Site Conditions and Site Meeting(s)" of the Submission Instructions section for further information.

2.3 Scope of Work

2.3.1 Key Construction Milestones

a. **Commence Work**: The Contractor shall commence the Work within seven (7) days from the receipt of the Notice of Award Letter (approximately March 2025).

b. **Ready-For-Takeover:** The Contractor shall achieve Ready-For-Takeover by November 1, 2025.

c. **Completion:** The Contractor shall achieve Completion by November 8, 2025.

NOTE: Dates above are subject to change at the sole discretion of the Region and/or HCHC.

2.3.2 **Technical Specifications and Drawings**

The Technical Specifications and Drawings are attached hereto as Schedule 1.

2.4 Term of Agreement

2.4.1 The Agreement shall commence within seven (7) days of Contract execution and shall continue until project completion (estimated duration = eight to nine (8-9) months).

2.5 Pricing

2.5.1 Prices shall be in Canadian Dollars and exclusive of taxes.

2.5.2 Prices are to remain firm for the duration of the Agreement term.

2.6 Contract Between HCHC and Successful Proponent

The successful Proponent will be required to enter into a CCDC 2 – 2020 Stipulated Price Contract (attached hereto as Attachment "C"), as amended by the supplementary conditions (attached hereto as Attachment "D"), with HCHC prior to Award.

2.7 Documentation Required for Award

Prior to Award, the successful Proponent will be required to provide the following documentation to the satisfaction of the Region and HCHC:

a. Insurance Certificate that meets all requirements stipulated in Attachments “C” and “D” and in the format of the Sample Certificate of Insurance (included in the “Forms” section),

b. A satisfactory clearance certificate from the Workplace Safety and Insurance Board (WSIB),

c. Completed and signed Contractor Checklist (attached hereto as Schedule 2),

d. Safety Data Sheets, if applicable,

e. Completed and signed New/Change Vendor and Electronic Funds Transfer Application, as per attached form (for new vendors),

f. Performance Security (as detailed in Sections 1.30.3 and 1.30.4), and

g. CCDC 2 – 2020 Contract, as amended by the supplementary conditions, executed between HCHC and the successful Proponent.

[END OF SECTION 2]

SECTION 3: PROPOSAL PROCESS

3.1 Timeline

3.1.1 This timeline reflects the Region's intent in issuing, receiving and evaluating Proposals and is subject to change at the Region's discretion.

Events	Date and Time
Issue Date	**Thursday, November 7, 2024**
Non-Mandatory Site Meeting	**Tuesday, November 19, 2024, at 10:00 a.m. ET**
Deadline for asking questions in writing	**Wednesday, November 27, 2024, at 4:00 p.m. ET**
Request for Proposals Closing Date	**Thursday, December 5, 2024, at 2:00 p.m. ET**
Anticipated Notification of Award	**Second week of January, 2025**
Anticipated Commencement of Contract	**Q1 2025**

3.2 Evaluation Criteria and Selection Process

3.2.1 The Proposal submission is to be submitted through the Bidding System at https://haltonregion.bidsandtenders.ca as follows:

- **One PDF document of the Vendor Code of Conduct Acknowledgement Form is to be submitted as an upload file,**
- **One PDF document of the Bid Bond (as per Section 1.29),**
- **One PDF document of the Agreement to Bond (as per Sections 1.30.1 and 1.30.2),**
- **One PDF document of the Mandatory Submission Requirements (pass/fail) outlined in Section 3.7.1.4.**
- **One PDF document of the Technical Proposal is to be submitted as an upload file; and**
- **The Cost Proposal is to be submitted using the on-line pricing schedules (Schedule of Prices) through the Bidding System.**

3.2.2 Documents are to be uploaded in PDF format and not have a security password. The Proponent is responsible to ensure that all uploaded documents are not defective, corrupt or blank and can be opened and viewed by the Region.

3.2.3 The evaluation committee will review the Technical Proposals and assign a score out of seventy (70) points to each Technical Proposal based on the following technical evaluation criteria and weighted as follows:

Reference	Mandatory / Technical Proposal	Evaluation Criteria	Weight (Points)	Minimum Threshold (Points)
RFP Section 3.7.1.4 a.	Mandatory Requirement	1. **CCDC11-2019 Front End Qualification Statement** including Company Information, Qualifications and Experience of Key Office and Site Personnel	N/A	Pass/Fail
RFP Section 3.7.1.4 b.	Mandatory Requirement	**2. Appendix A** - CCDC11-2016 Project Experience – Major construction projects completed in the past five (5) years	N/A	Pass/Fail
RFP Section 3.7.1.4 c.	Mandatory Requirement	**3. Appendix C** - CCDC11-2016 Project Experience – Major Construction Projects underway as of the date of submission of Contractor's Qualification Statement	N/A	Pass/Fail
RFP Section 3.7.1.4 d.	Mandatory Requirement	**4. Appendix F –** WSIB and Insurance	N/A	Pass/Fail
RFP Section 3.7.2.5.1	Technical Proposal	**1. Proponent Profile**	**15**	**N/A**
RFP Section 3.7.2.5.2	Technical Proposal	**2. Appendix B -** CCDC11-2019 Project Experience– minimum of five (5) comparable projects **completed** (similar type, size and complexity) including demonstrated experience in regards to the following (refer to Section 3.3.1): • Schedule preparation and schedule control • Coordinating with operations staff • Working with restrictive shutdown constraints • Customer service • Quality Management/assurance and control • Response to warranty issues • Understanding of Regulatory Compliance as applicable to each project • References and up to date contact information for each	**35**	**N/A**
RFP Section 3.7.2.5.3	Technical Proposal	**3. Appendix D** – Claims and Legal Information	**10**	**N/A**
RFP Section 3.7.2.5.4	Technical Proposal	**4. Appendix E -** Health and Safety Program / Training Programs	**10**	**N/A**
		Technical Proposal Evaluation Criteria Total	**70**	**49**

3.2.4 **Technical Proposals are to be organized exactly as per the order shown in the table above (for ease of review and evaluation).** Each section heading is to reference the subject as well as the applicable RFP section number. For example: 3.7.2.5.1 – Proponent Profile.

3.2.5 Technical Proposals will be assessed on the basis of information provided by the Proponent at the time of submission as well as any clarification provided during any subsequent communication with the Proponent (before the Cost Proposal is opened). Technical scores may be adjusted based on the results of interview, references, site visits, demonstrations, etc. at the discretion of the Region, which may result in the Cost Proposal being removed from further consideration.

3.2.6 Technical Proposals that do not pass the minimum technical score threshold of seventy percent (70%) (i.e., 49 points out of 70) will be removed from further consideration.

3.2.7 Technical Proposals that pass the minimum technical score of seventy percent (70%) or greater will then have their Cost Proposal evaluated.

3.2.8 Cost Proposals are weighted as follows:

Cost Proposal Evaluation Criteria	Weight (Points)
Cost Effectiveness	30

3.2.9 Cost Proposals will be scored based on a relative pricing formula using the rates set out in the Schedule of Prices. Each Proponent will receive a percentage of the total possible points allocated to price, which will be calculated in accordance with the following formula:

$$lowest\ price \div proponent's\ price \times weighting = proponent's\ pricing\ points$$

3.2.10 The score for the Cost Proposal will be added to the score for the Technical Proposal, in order to obtain the total score. The Proposal with the highest overall score will be selected for Award as the highest-ranking Proposal that provides the greatest overall benefit to Halton Community Housing Corporation.

3.3 Interviews

3.3.1 Interviews may be conducted at the discretion of the Region and/or HCHC.

3.4 Reference Checks

3.4.1 Reference checks may be conducted at the discretion of the Region and/or HCHC.

3.5 Notification of Award and Debriefing

3.5.1 Proponents will be notified of the Award when it is posted on the Public Procurement Website at (https://haltonregion.bidsandtenders.ca).

3.5.2. Should a Proponent request a debriefing, and where the Contract value is $100,000 or greater, Supply Chain Management shall offer separate debriefings to unsuccessful Proponents after Award of the Contract. The request for a debriefing must be submitted by a Proponent in writing to the Region's Designated Sourcing Representative identified in the procurement solicitation documents within sixty (60) days after the publication of the name of the successful Proponent, failing which no debriefing will be provided. The debrief session may be held in person, by telephone, or by other electronic means available, at the discretion of Supply Chain Management.

3.6 Sufficient Funds

3.6.1 Without limiting any right the Region and/or HCHC may have pursuant to Section 1.12 Privilege Clause, where sufficient funds are not available, the Region/HCHC reserves the right to Award this Contract in whole or in partial assignments as per the Schedule of Prices.

3.7 Proposal Submission Contents

3.7.1 Mandatory Submission Requirements

3.7.1.1 One PDF copy of the completed and signed Halton Region Vendor Code of Conduct Acknowledgement Form (page 20 of the Halton Region Vendor Code of Conduct).

3.7.1.2 One PDF document of the Bid Bond (as per Section 1.29);

3.7.1.3 One PDF document of the Agreement to Bond (as per Sections 1.30.1 and 1.30.2);

3.7.1.4 One PDF document containing the following:

a. Completed, signed and sealed (Canadian Standard Construction Document) CCDC11-2019 **Contractor's Qualification Statement** including Company Information, Qualifications and Experience of Key Office and Site Personnel
(NOTE: This is a pass/fail submission requirement).

b. Completed (Standard Construction Document) "**Appendix A"** to CCDC11-2019 Contractor's Qualification Statement – Key construction projects completed in the past five years". Provide at minimum three (3) projects.
(NOTE: this is a pass/fail submission requirement).

c. Completed (Standard Construction Document) "**Appendix C"** to CCDC11-2019 Contractor's Qualification Statement – Key construction projects underway as of the date of submission of Contractor's Qualification Statement".
(NOTE: this is a pass/fail submission requirement).

NOTE: Proponents are responsible for obtaining the required CCDC forms, which can be obtained via approved CCDC document outlets such as the Hamilton-Halton Construction Association (www.hhca.ca). A complete listing of approved CCDC document outlets can be found at www.ccdc.org.

d. Entitled as "**Appendix F** – WSIB and Insurance" – Provide a current:
   i. Workplace Safety and Insurance Board clearance certificate.
   ii. Workplace Injury Summary Report (WSIR) or equivalent.
   iii. Letter from your insurance company stating that the following levels of insurance coverage are available:
      A. Commercial General Liability of five million dollars ($5,000,000.00) per occurrence, and not less than ten million dollars ($10,000,000.00) in the aggregate.
      B. Automobile liability of five million dollars ($5,000,000.00).

   (NOTE: this is a pass/fail submission requirement).

3.7.2 **Technical Proposal Requirements**

3.7.2.1 **One PDF document of the Technical Proposal is to be submitted as an upload file to the Bidding System.**

3.7.2.2 **The requirements outlined in this section are to be answered in the order that they are listed in a clear and concise manner. Contents of Technical Proposal submissions are to include information specific to RFP requirements only. Proponents are strongly discouraged from including broad marketing materials containing extraneous information that has not been requested as part of this RFP. Failure to organize the Technical Proposal in the order requested or omission of any requested information may cause the Proposal submission to be considered incomplete and removed from further consideration.**

3.7.2.3 Proponents are strongly encouraged to organize (order) their technical proposal submissions as per the order of the following sections 3.7.2.5.1 through 3.7.2.5.4. Each section heading is to reference the subject as well as the applicable RFP section number. For example: 3.7.2.5.1 – Proponent Profile.

3.7.2.4 Unless otherwise specified in the bid documents, Technical Proposal submissions are not to contain any cost or fee information. Proponents that include cost or fee information in their Technical Proposal submission may have their proposals removed from further consideration.

3.7.2.5 The following requirements are to be included in the Technical Proposal submission:

3.7.2.5.1 **Proponent Profile**
(Total Points = 15)

Provide a summary in no more than three (3) pages that includes the following:

i. Proponent profile, including size of the organization, areas of expertise, and depth of experience of the organization
ii. The number of years the Proponent has been active in these fields
iii. Any professional certifications and awards the Proponent has earned
iv. The address and telephone number of the Proponent's main office and any regional/local branches from which the work is to be directed

3.7.2.5.2 **CCDC 11 Corporate Experience & Project History Information**
(Total Points = 35)

Completed (Standard Construction Document) "**Appendix B** to CCDC11-2019 Contractor's Qualification Statement – Comparable projects completed (similar type, size and complexity)" with the following revisions:

a. Proponents must provide at minimum, five (5) project profiles completed in the past five (5) years.

b. The project profiles should detail projects of similar size, scope and complexity as outlined in the scope of work of this RFP (Schedule 1). Include any municipal/government or corporate agencies with whom your firm is pre-qualified or on a preferred contractors list. Respondents may provide details for additional projects that are similar in type and value. References for General Contractors should be for works in excess of two hundred and fifty thousand dollars ($250,000.00).

c. For each project submitted in Appendix B, include in the "Description" section of the CCDC11 document (**or if there is insufficient room, provide on a separate pages in sequence**), the following additional relevant information:

i. Schedule preparation and schedule control (demonstrating adherence to and control of project's triple constraint of schedule, scope and budget
ii. Coordinating with operations staff
iii. Working / dealing with restrictive shutdown constraints
iv. Customer service
v. Quality Management/assurance and control
vi. Response to warranty issues
vii. Understanding of Regulatory Compliance as applicable to each project
viii. References with up-to-date contact information for each

NOTE: Proponents are to address each of the above requirements in the order listed above.

The Proponent must complete information in the project profiles for total project, planned and actual date completed, project value and reference contact information (including Owner and Consultant name and telephone number).

3.7.2.5.3 **Entitled as "Appendix D – Claims and Legal Information" (Total Points = 10)**

Provide a list of **all** outstanding legal disputes, including but not limited to contractual claims and/or legal actions, involving the Proponent and any past or present client, including Halton Region or Halton Community Housing Corporation. Alternatively, provide a statement that none exists, if this is the case.

3.7.2.5.4 **Entitled as "Appendix E – Health and Safety Program / Training Programs" (Total Points = 10)**

a. Proponent to provide written confirmation that the Proponent has a comprehensive Health and Safety Policy (including COVID-19 protocols) and that it will be followed for the duration of this project (attach a copy of the index/table of contents page as evidence).

b. Provide written confirmation of the Proponent's training programs and processes/protocols/tracking for ensuring that training is kept up to date. Additionally, include copies of policies and protocols to ensure that sub-contractors training programs mirror that of Proponent's programs (WHMIS, working at heights, employee training, etc.).

3.7.3 **Cost Proposal**

The Cost Proposal is to be submitted using the on-line Schedule of Prices through the Bidding System.

[END OF SECTION 3]

SCHEDULES

SCHEDULE 1 – TECHNICAL SPECIFICATIONS AND DRAWINGS

234-274 Woodside Dr. & 1285-1299 Sedgewick Cr HALTON COMMUNITY HOUSING CORPORATION

POWER AND HVAC UPGRADES

MECHANICAL/ELECTRICAL SPECIFICATIONS

Prepared for: Region of Halton

INDEX OF SPECIFICATIONS

TABLE OF CONTENTS

PART 1 - GENERAL

1.1. **GENERAL**

1.1.1 This specification defines the general requirements and procedures for submittals. A submittal is information submitted for the Consultant's review to establish compliance with the contract documents.

1.1.2 Detailed submittal requirements are found in the technical sections of the contract specifications. The Consultant may request submittals in addition to those specified when deemed necessary to adequately describe the work covered in the respective technical specifications at no additional cost to the Client

1.1.3 Consultant review of a submittal does not relieve the Contractor of the responsibility for compliance with the contract documents or any error which may exist. The Contractor is responsible for fully complying with all contract requirements and the satisfactory construction of all work, including the need to check, confirm, and coordinate the work of all subcontractors for the project. Non-compliant material incorporated in the work will be removed and replaced at the Contractor's expense.

1.2 **DEFINITIONS**

1.2.1 Shop Drawings: Drawings, diagrams, and schedules specifically prepared to illustrate some portion of the work. Drawings prepared by or for the Contractor to show how multiple systems and interdisciplinary work will be integrated and coordinated.

1.2.2 Product Data: Catalog cuts, illustrations, schedules, diagrams, performance charts, instructions, and brochures, which describe and illustrate size, physical appearance, and other characteristics of materials, systems, or equipment for some portion of the work. Samples of warranty language when the contract requires extended product warranties.

1.2.3 Samples: Physical examples of materials, equipment, or workmanship that illustrate functional and aesthetic characteristics of a material or product and establish standards by which the work can be judged. Color samples from the manufacturer's standard line (or custom color samples if specified) to be used in selecting or approving colors for the project. Field samples and mock-ups constructed to establish standards by which the ensuing work can be judged.

1.2.4 Design Data: Calculations, mix designs, analyses, or other data pertaining to a part of work.

1.2.5 Test Reports: Report which includes findings of a test required to be performed by the Contractor on an actual portion of the work. Report which includes finding of a test made at the job site or on sample taken from the job site, on portion of work during or after installation.

1.2.6 Certificates: Document required of Contractor, or of a manufacturer, supplier, installer, or subcontractor through Contractor. The purpose is to document procedures, acceptability of methods, or personnel qualifications for a portion of the work.

1.2.7 Manufacturer's Instructions: Pre-printed material describing installation of a product, system, or material, including special notices and MSDS concerning impedances, hazards, and safety precautions.

1.2.8 Manufacturer's Field Reports: Documentation of the testing and verification actions taken by manufacturer's representative at the job site on a portion of the work, during or after installation, to confirm compliance with manufacturer's standards or instructions. The documentation must indicate whether the material, product, or system has passed or failed the test.

1.2.9 Operation and Maintenance Data: Manufacturer data that is required to operate, maintain, troubleshoot, and repair equipment, including manufacturer's help, parts list, and product line documentation. This data shall be incorporated in an operations and maintenance manual.

1.2.10 Closeout Submittals: Documentation necessary to properly close out a construction contract. For example, Operation and Maintenance manuals, as-built drawings. Also, submittal requirements necessary to properly close out a phase of construction on a multi-phase contract.

1.3 **SUBMITTAL REGISTER**

1.3.1 The submittal register prepared by the Contractor will list items of equipment and materials for which submittals are required by the specifications. This list may not be all inclusive and additional submittals may be required by the specifications. The Contractor is not relieved from supplying submittals required by the contract documents but which have been omitted from the submittal register.

1.3.2 The submittal register will serve as a scheduling document for submittals and will be used to control submittal actions throughout the contract period.

1.3.3 The Contractor shall provide the initial submittal register in electronic format. Thereafter, the Contractor shall track all submittals by maintaining a complete list, including completion of all data columns, including dates on which submittals are received and returned by the Consultant.

1.3.4 The Contractor shall update the submittal register as submittal actions occur and maintain the submittal register at the project site until final acceptance of all work by Client representative.

1.3.5 The Contractor shall submit formal monthly updates to the submittal register in electronic format. Each monthly update shall document actual submission and approval dates for each submittal.

1.4 SUBMISSION PROCEDURES – SHOP DRAWINGS

1.4.1. The contractor shall review all shop drawings before submittal to the Consultant. This review implies that the Contractor has determined or will determine measurements and has verified or will verify on the site, the construction criteria, materials, catalog numbers and similar data, and that he has reviewed and coordinated each shop drawing with the Contractual Documents and Specifications.

1.4.2. Submit shop drawings to the Consultant within reasonable delays and in a logical sequence in compliance with the construction schedule.

1.4.3. Submit for approval, all of the items specifically mentioned under the separate sections of the specification, with information sufficient to evidence full compliance with contract requirements. Materials, fabricated articles and the like to be installed in permanent work shall equal those of approved submittals.

1.4.4. Submission Preparation

1.4.4.1. Each submittal is to be complete and in sufficient detail to allow ready determination of compliance with contract requirements.

1.4.4.2. Collect required data for each specific material, product, unit of work, or system into a single submittal. Prominently mark choices, options, and portions applicable to the submittal. Partial submittals will not be accepted for expedition of construction effort. Submittal will be returned without review if incomplete.

1.4.4.3. All irrelevant or unnecessary data shall be removed from the submittal to facilitate accuracy and timely processing. Submittals that contain the excessive amount of irrelevant or unnecessary data will be returned with review.

1.4.4.4. Forward submittals in sufficient time to permit proper consideration and approval action by the Consultant; minimum time required for Consultant's review shall be 10 business days or longer, if the submitted equipment does not match the standard of acceptance and additional time is required for the evaluation.

1.4.4.5. Schedule submission to assure adequate lead time for procurement of contract required items. Delays attributable to untimely and rejected submittals will not serve as a basis for extending contract time for completion.

1.4.4.6. The Consultant's review consists in reviewing the conformity of shop drawings with the contract documents for recommendation to the Client or Owner. The Consultant is not liable for any responsibility for dimensions, details nor quantities.

1.4.4.7. After an item has been reviewed by the Consultant no change in brand or make will be permitted unless:

1.4.4.7.1. Satisfactory written evidence is presented to, and positively reviewed by the Consultant, that manufacturer cannot make scheduled delivery of approved item or;
1.4.4.7.2. Item delivered has been rejected and substitution of a suitable item is an urgent necessity or;
1.4.4.7.3. Other conditions become apparent which indicates approval of such substitute item to be in best interest of the Client.

1.4.5. If the Contractor installs equipment or material for which he has not submitted shop drawings for verification, the Consultant may, if the equipment or material is not installed in accordance with plans and specifications, require the equipment or material to be removed and replaced by a compliant product at no additional cost to the Client

1.4.6. Shop drawings relating to products, special design systems or installations, custom equipment or similar to, all of which are not standard or catalogued products, will be considered engineering documents and as such, shall be authenticated by their author engineer. Authentication shall be in conformity with current Province of Ontario Laws and By-Laws. As an example, not limited to, shop drawings of a custom air-handling unit are covered by the present article and as such, constitute engineering documents that will require an authentication by their author engineer.

1.4.7. When shop drawings are resubmitted, indicate in writing all revisions other than those required by the Consultant.

1.4.8. Submit for review by the Consultant, within reasonable delays of the contract award, the complete set of shop drawings required. Faxed shop drawings are not accepted.

1.4.9. Shop drawings shall be submitted in electronic format. The following rules must be followed entirely:

1.4.9.1. The identification form must be included;
1.4.9.2. A shop drawing identification sheet hereby mentioned shall be included;
1.4.9.3. A single file in PDF format for each shop drawing shall be submitted. In the case where more than one document constitute the drawing, they must all be incorporated into a single file;
1.4.9.4. Printing parameters of the drawings must be incorporated in the file to assure a scaled printing on a commercial printer;
1.4.9.5. The file must be of an excellent graphical quality;
1.4.9.6. Transmission of the shop drawings must follow the path of communication established for the project;
1.4.9.7. A transmittal sheet shall be attached to submitted drawings.

1.4.10. Shop drawings not following these directives will be returned to the contractor with a "Rejected" recommendation.

1.4.11. Each shop drawing shall be presented with an identification form. The shop drawing identification sheet shall include as a minimum the following information:

1.4.11.1. Owner's name
1.4.11.2. Project's name
1.4.11.3. Consultant’s name
1.4.11.4. Contractor's name
1.4.11.5. Name of sender
1.4.11.6. Sub contractor's name
1.4.11.7. Supplier's name
1.4.11.8. Specialty
1.4.11.9. Description
1.4.11.10. Specifications section number and article number
1.4.11.11. Revision number
1.4.11.12. Blank space for stamp of Conformity Review.

1.4.12. Submit all shop drawings in English, certified for construction by the manufacturer.

1.4.13. Drawings for non-standard articles or materials shall be produced, especially for the project.

1.4.14. Shop drawings shall include:

1.4.14.1. Construction details, dimensions, weights and equipment or material characteristics together with supplementary information such as bulletins, illustrations and exploded views of constituting parts.
1.4.14.2. Graphs, curves, capacities, efficiency and other technical data submitted by the manufacturer or requested by the Engineer concerning the operation of the equipment.
1.4.14.3. Wiring diagrams, single line diagrams, principle diagrams, control diagrams, operating sequences and all interconnections with other systems when required.
1.4.14.4. Flow diagrams for air, water, oil, fuel, etc. if applicable.
1.4.14.5. Marketing folders or publicity brochures will not be accepted.

1.4.15. Shop drawings will be returned with one or two of the following mentions: "Reviewed", "Modify and resubmit", "Modify as noted", "Rejected".

1.4.16. Drawings stamped "Reviewed" will not be further commented. Drawings comply with contractual documents.

1.4.17. Drawings stamped "Rejected" shall be done over again and resubmitted for approval. Drawings do not comply with contractual documents.

1.4.18. Drawings stamped "Modify as noted" shall not be resubmitted. Conditionally to the corrections indicated, drawings comply with contractual documents.

1.4.19. Drawings stamped "Modify and resubmit" shall be resubmitted, in part or in whole, as indicated for further examination. Drawings do not comply with contractual documents.

1.4.20. Drawings stamped "Modify as noted" and "Modify and resubmit" shall be resubmitted in part or in whole, as indicated, for further examination. Conditionally to the corrections indicated, drawings comply with contractual documents.

1.4.21. The Consultant's examination of the shop drawings does not relieve the Contractor from supplying equipment conforming to current standards and bylaws and to the requirements of this specification.

1.4.22. Any equipment, which is manufactured without the Engineer's prior examination, may be rejected. Assume all costs inherent to such a rejection.

1.5. **SUBMISSION SCHEDULING**

1.5.1. Submittals are to be scheduled, submitted, reviewed, and returned to the Contractor prior to the acquisition of the material or equipment. All comments marked by the Consultant shall be incorporated in the item for which a submission was made. No material or equipment shall be acquisitioned if the respective submissions was reviewed and rejected by the Consultant

1.5.2. Coordinate scheduling, sequencing, preparing, and processing of submittals with performance of work so that work will not be delayed by submittal processing. Allow time for potential re-submittal.

1.5.3. No delay costs or time extensions will be allowed for time lost in late submittals or re-submittals.

1.5.4. All submittals are required to be reviewed prior to the start of the specified work activity.

1.6 **AS BUILT DOCUMENTATION**

1.6.1 During progress of the Work, Contractor shall maintain a set of Record Documents and Shop Drawings at the Site. Contractor must update these documents weekly, at a minimum, with mark-ups of actual installations that vary from the Work as originally shown. Contractor shall include all Drawings issued as addenda, clarifications, or Change Orders.

1.6.2 Contractor shall maintain and have available for review in conjunction with project progress meetings, a current set of the marked-up Record Documents and Shop Drawings. Availability for review and acceptability of both the format and content are prerequisites for certification and acceptance of the Application for Payment by the Client and Consultant.

1.6.3 Contractor must protect marked-up Record Documents from deterioration and loss in a secure location.

1.7 **RECORD DOCUMENTS EDIT LOG**

1.7.1 During progress of the Work, Contractor shall update the Record Documents Edit Log each time updates or edits are made, or information is added. The Record Documents Edit Log shall be submitted to the Consultant and Client prior to submitting each monthly Application for Payment.

1.7.2 The Record Documents Edit Log shall include the following information as a minimum:

1.7.2.1 Date Edited.

1.7.2.2 Name and Company of Person Making Edit.

1.7.2.3 Edit Type: RFI, Change Order/Request for Proposal, Field Change, Red Line,

1.7.2.4 Supplemental Document, and Revision/ASI.

1.7.2.5 Reference: name and number of the source document if applicable, such as Change Order

1.7.2.6 or RFI number.

1.7.2.7 Sheet(s) Edited.

1.8 **AS-BUILT DRAWINGS**

1.8.1. Contractor must mark-up Drawings that are most compatible for showing actual physical condition, fully and accurately and must reference all other appearances of this Work to the updated sheet. Contractor must include cross-references to the Change Order number on the updated Drawing sheet and all additional sheets where the Work is shown.

1.8.2. Contractor must mark-up with erasable colored pencil, in a legible and professional manner using separate colors where feasible, to distinguish between changes for different categories of Work at the same general location.

1.8.3. Contractor must mark-up important additional information, which was either shown schematically only or omitted from the Construction Documents. Contractor must give particular attention to information on concealed work that would be difficult to identify or measure and record at a later date.

1.8.4. The contractor shall receive from the Consultant a set of electronic files of the project, with the engineering seal, stamp, signature and Consultant's logo removed.

1.8.5. The contractor shall use the files as backgrounds on which all the changes recorded during the construction phase shall be transcribed electronically.

1.8.6. Once all the changes have been transcribed on the backgrounds, the drawings shall be electronically stamped "AS BUILT DRAWINGS" and shall be converted to pdf format and submitted to the Consultant for review. The Contractor remains responsible for the accuracy of the recorded information.

1.8.7. In association with Contractor’s request for Substantial Completion inspection, Contractor must submit one (1) electronic copy of the marked-up as-built drawings to Client's representative.

1.9 **RECORD SPECIFICATIONS**

1.9.1 It is mandatory that all changes to specified materials, installation, warranty, etc. be clearly and fully marked within the applicable Specification section in a manner acceptable to the Consultant and Client. Contractor shall review with the Owner and document an acceptable procedure early in the construction phase.

1.9.2 Contractor must give particular attention to substitutions, selection of options, and similar information on work where the exact products used are not clearly identified or readily discernible in the original Specifications. When applicable, Contractor must cross-reference related Record Drawing information and product data.

1.9.3 Contractor must neatly transcribe and post all marked-up information to a "clean" copy of the Specifications, ensuring that similar types of information are annotated in like fashion throughout the Specifications. The Record Specifications shall then be converted to pdf format and submitted to the Consultant for review. The Contractor remains responsible for the accuracy of Record Specifications content.

1.9.4 In association with Contractor's request for Substantial Completion inspection, Contractor must submit the electronic version (pdf) of the Record Specifications to the Client representative.

1.10. **OPERATION AND MAINTENANCE MANUALS**

1.10.1. Submit operations and maintenance and operation data for all required equipment min. 15 days before application for Substantial Completion of the work. Substantial Completion status for the work will not be granted in the absence of full Operations and maintenance Information.

1.10.2. Contractor shall furnish the following equipment data content to be Included in Operating and Maintenance Manuals:

1.10.2.1. *Description of Equipment*.

1.10.2.2. *Record Product Submittals*. Clearly identify all options and accessories of actual installed product and variations in the actual Work in comparison with submitted information.

1.10.2.3. *Parts List.* Clearly identify every part in the item of equipment with the proper manufacturer's name, part nomenclature and number, local source, and list price.

1.10.2.4. *Recommended Spare Parts List*. For each equipment item that Owner will likely need within a 12-month period to support and operate that item of equipment. The quantities of spare parts recommended must be based upon the quantity of like equipment items installed under the Contract Documents.

1.10.2.5. *Normal Operating Instructions*. Detailed information to permit a journeyman mechanic to adjust, start-up, operate, and shut down the equipment. Special start-up precautions shall be noted as well as other action items required before the equipment is put into service.

1.10.2.6. Emergency Operating Procedures. Detailed description of the sequence of action to be taken in the event of a malfunction of the unit, either to permit a short period of continued operation or emergency shutdown to prevent further damage to the unit and to the system in which it is installed.

1.10.2.7. *Preventive Maintenance*. Detailed information to cover routine and special inspection requirements, including but not limited to, field adjustments, inspections for wear, adjustment changes, packing wear, lubrication points, frequency and specific lubrication type required, cleaning of the unit and type solvent to use, and such other measures as are applicable to preventive maintenance program.

1.10.2.8. *Calibration.* Detailed data on what to calibrate, how to calibrate, when to calibrate and procedures to enable checking the equipment for reliability or indications as well as data for test equipment, special tools and the location of test points.

1.10.2.9. *Scale and Corrosion Control*. Detailed information covering the prevention of and removal of scale and corrosion.

1.10.2.10. *Trouble Shooting Procedures*. Detailed information and procedures for detecting and isolating malfunctions and detailed information concerning probable causes and applicable remedies.

1.10.2.11. *Removal and Installation Instructions.* Detailed information concerning the logical sequence of steps required to remove and install the item including instructions for the use of special tools and equipment.

1.10.2.12. *Disassembly and Assembly Instructions*. Detailed illustrations and text to show the logical procedure and provide the instructions necessary to disassemble and assemble the unit properly. The text shall include all checks and special precautions as well as the use of special tools and equipment required to perform the assembly or disassembly.

1.10.2.13. *Repair Instructions*. Detailed repair procedures to bring the equipment up to the required operating standard including instruction for examining equipment and parts for needed repairs and adjustments, and tests or inspections required to determine whether old parts may be reused or must be replaced.

1.10.2.14. *Special Tools and Test Equipment*. Detailed list of the special tools and test equipment needed to perform repair and maintenance for each equipment item. The list shall contain the special tool and test equipment part number, size, quantity, price, manufacturer’s name and address, and local supplier’s name and address.

1.10.2.15. *System Drawings*. Contractor shall furnish detailed drawings, where applicable, that clearly show wiring diagrams, utility service diagrams, control diagrams, system schematics, pneumatic and fluid flow diagrams, etc., which pertain to the unit function. System drawings must show major pieces of equipment, such as chillers, boilers, heat exchangers, pumps, air handlers, tanks, switchgear, etc., as meaningful to the Project. Fluid flow and direction and valves with their valve tag identification numbers must be clearly noted on drawings. Drawings must show modifications to another manufacturer's standard unit when it is incorporated into the assembly or package unit.

1.10.3. Warranties And Guarantees

1.10.3.1. Contractor shall include, within the Operating and Maintenance Manual organizational structure for each system, equipment item, or material, an executed copy of the specified warranty/guarantee with warranty effective dates covering that particular system, equipment item, or material. Contractor

shall include the manufacturer's warranty as specified and the installing subcontractor's and supplier's guarantee for workmanship and system operation.

1.10.4. Requirements For Close-Out Manual

1.10.4.1. The Close-Out Manual shall include, but is not limited to, the following:

1.10.4.1.1. Commissioning documentation, pre-functional and functional check lists and forms (where Commissioning is part of the Contract).

1.10.4.1.2. Final air balance reports produced by the Test, Adjust, and Balance Firm.

1.10.4.1.3. Completed Valve Schedule and Fire, Fire/Smoke and Smoke Damper Schedule

1.10.4.1.4. Owner Demonstration / Training Reports: Contractor shall furnish Training Plan and Documentation of Owner's personnel training regarding operation of systems. Contractor shall include identification of parties receiving training and date(s) of such training.

1.10.4.1.5. Electrical Test Reports (including factory tests and settings).

1.10.4.1.6. Miscellaneous Equipment Test Reports (including factory tests and settings).

1.10.4.1.7. HVAC Calibration Reports (including duct testing reports).

1.10.4.1.8 Fire Alarm Test Reports.

1.10.4.1.9. Piping Test Reports.

1.10.4.1.10. Code-required Certifications as described within Technical Specifications.

1.10.4.1.11. Material Safety Data Sheets (MSDS) for any and all products incorporated into the Project.

1.10.5. Miscellaneous Close-out Documents.

1.10.5.1. Contractor shall provide categories of requirements resulting in miscellaneous work records including, but not be limited to, the following:

1.10.5.1.1 Required field records on excavations, foundations, underground construction, wells and similar work.

1.10.5.1.2. Accurate survey showing locations and elevations of underground lines, including invert elevations of drainage piping. Surveys establishing lines and levels of building.

1.10.5.1.3. Certifications received in lieu of labels on products and similar record documentation.

1.10.5.1.4. Testing and qualification of tradesmen.

1.10.5.1.5. Documented qualification of installation firms.

1.10.5.1.6. Materials testing reports.

1.10.5.1.7. Final inspection Punch-list and deficiency corrections.

1.10.5.1.8. All original, signed Project warranties and guarantees.

1.11. MAINTENANCE AND OPERATIONS MANUAL FORMATTING

1.11.1. Provide minimum of two (2) hard copies and one electronic copy of Mechanical Maintenance Manuals, in accordance to the following:

1.11.2. Manuals to be bound in a hard cover neatly labeled: "OPERATING AND MAINTENANCE INSTRUCTIONS".

1.11.3. The Maintenance and Operations Manuals shall be divided into sections with neatly labeled and tabbed dividers between each section. The sections to be included in the manual are:

1.11.3.1. Section I General.

1.11.3.2. Section II Piping and Pump Systems, Ductwork and Accessories.

1.11.3.3. Section III – HVAC Equipment/Electrical Equipment

1.11.3.4. Section IV Automatic Controls

1.11.3.5. Section V - Air and Water Balancing

1.11.4. The following information shall be contained within the sections:

1.11.4.1. SECTION I: A list giving name, address and telephone number of the Consultant, Engineers, General Contractor, Mechanical Trade and Controls Trade. Written warranties for the Mechanical Systems. A copy of the Valve directory giving number, valve location, normal valve position, and purpose of valve. Equipment lists and certificates shall be provided - certificates shall be signed and sealed by the appropriate suppliers.

1.11.4.2. SECTION II, III: A copy of all pressure tests and operational tests. A copy of Gas Operational Tests for gas fired equipment. A list giving name, address and telephone number of all suppliers. Details of chemical treatment equipment and substances. A copy of all reviewed Shop Drawings for all mechanical equipment and ancillary devices (valves, expansion tanks, pumps, strainers, plumbing, etc). Copies of warranties.

1.11.4.3. SECTION IV: Complete Control Diagrams, Wiring Diagrams and description of Control system and the functioning sequence of the system.

1.11.4.4. SECTION V: Complete air and hydronic balancing reports.

1.12 **WITHHOLDING OF PAYMENT**

1.12.1 Payment for materials incorporated in the work will not be made if required approvals have not been obtained.

TABLE OF CONTENTS

PART 1 - GENERAL

1.1. **DESCRIPTION:**

1.1.1. This section specifies demolition and removal of utilities, Services and equipment, as noted on the drawings and as required for the completion of the new Work

1.2. **DEFINITIONS**

1.2.1. Remove: Detach items from existing Construction and dispose of them off-site unless indicated to be salvaged or reinstalled.

1.2.2. Remove and Salvage: Detach items from existing Construction, in a manner to prevent damage, and deliver to Owner ready for reuse or store as noted on Drawings.

1.2.3. Remove and Reinstall: Detach items from existing Construction, in a manner to prevent damage, prepare for reuse, and reinstall where indicated.

1.2.4. Existing to Remain: Leave existing items that are not to be removed and that are not otherwise indicated to be salvaged or reinstalled.

1.2.5. Dismantle: To remove by disassembling or detaching an item from a surface, using gentle methods and equipment to prevent damage to the item and surfaces; disposing of items unless indicated to be salvaged or reinstalled.

1.3. **WARRANTY**

1.3.1. Existing Warranties: Remove, replace, patch, and repair materials and surfaces cut or damaged during demolition, by methods and with materials and using approved contractors so as not to void existing warranties. Notify warrantor before proceeding.

1.3.2. Notify warrantor on completion of selective demolition and obtain documentation verifying that existing system has been inspected and warranty remains in effect. Submit documentation at Project closeout.

1.4. **PROTECTION:**

1.4.1. Perform demolition in such manner as to eliminate hazards to persons and property; to minimize interference with use of adjacent areas, utilities and structures or interruption of use of such utilities; and to provide free passage to and from such adjacent areas of structures.

1.4.2. Carry out all demolition Work in a neat and orderly manner. Keep noise, dust, and similar nuisances to a minimum. Do not collapse walls. Do not throw or drop materials.

1.4.3. Provide safeguards, including warning signs, barricades, temporary fences, warning lights, and other similar items that are required for protection of all personnel during demolition and removal operations.

1.4.4. Where material indicated to be removed is suspected of containing asbestos, inform Client's Representative immediately. Do not disturb materials suspected of containing asbestos until asbestos content has been verified by Client.

1.4.5. Use extreme caution when cutting into shafts and chases. Shafts and chases may end above occupied areas within building. Take all necessary precautions to prevent debris from falling through openings between floors during demolition operations.

1.4.6. Maintain fences, barricades, lights, and other similar items around exposed excavations until such excavations have been completely filled.

1.4.7. Prevent debris from blocking drainage systems (floor drains) or affecting other mechanical and electrical systems that must remain in operation.

1.4.8. Protect building floors against damage from demolition Work. Use ½" plywood covers over floor where lifting, moving, rolling of removed equipment is anticipated. Be responsible for repairing any damage to flooring caused by the Work defined in this section. Execute repairs to the satisfaction of the Board at no cost to the Board.

1.4.9. Provide enclosed dust chutes with control gates from each floor to carry debris to truck beds and govern flow of material into truck. Provide overhead bridges of tight board or prefabricated metal Construction at dust chutes to protect persons and property from falling debris.

1.4.10. Prevent spread of flying particles and dust. Sprinkle rubbish and debris with water to keep dust to a minimum. Do not use water if it results in hazardous or objectionable condition such as, but not limited to; ice, flooding, or pollution. Vacuum and dust the Work area daily.

1.4.11. Maintain at least one stairway in each structure in usable condition to highest remaining floor. Keep stairway free of obstructions and debris until that level of structure has been removed.

1.4.12. Wherever a cutting torch or other equipment that might cause a fire is used, provide and maintain fire extinguishers nearby ready for immediate use. Instruct all possible users in use of fire extinguishers.

1.4.13. Keep hydrants clear and accessible at all times. Prohibit debris from accumulating within a radius of 4.5 m (15 feet) of fire hydrants.

1.4.14. Before beginning any demolition Work, the Contractor shall survey the site and examine the drawings and specifications to determine the extent of the Work. The Contractor shall take necessary precautions to avoid damages to existing items to remain in place, to be reused, or to remain the property of the Client.

1.4.15. Any damaged items shall be repaired or replaced as approved by the Consultant. The Contractor shall coordinate the Work of this section with all other Work and shall construct and maintain shoring, bracing, and supports as required.

1.4.16. The Contractor shall ensure that structural elements are not overloaded and shall be responsible for increasing structural supports or adding new supports as may be required as a result of any cutting, removal, or demolition Work performed under this Contract. Do not overload structural elements. Provide new supports and reinforcement for existing Construction weakened by demolition or removal works. Repairs, reinforcement, or structural replacement must have Resident Engineer's approval.

1.5. **QUALIFICATIONS**

1.5.1. Work of this section shall be executed by trades personnel having a minimum of five years experience in the demolition field and capable to deploy adequate equipment as required to complete the Work in an efficient and orderly manner.

1.6. **EXAMINATION**

1.6.1. Examine existing property. Determine the nature of materials to be removed.

1.6.2. When utilities or building Services are encountered that are not indicated on the drawings, the Consultant shall be notified prior to further Work in that area.

1.7. **SCHEDULING**

1.7.1. Coordinate the timing and duration of water supply, gas and power shut-down with the Client representatives.

1.8. **MAINTAINING TRAFFIC**

1.8.1. Maintain and preserve Client's access requirements within, to and from existing building in areas where demolition and removal Work is being carried out.

1.8.2. Do not close, obstruct, place or store material in the building driveways and passageways. Conduct operations with minimum interference with roads, streets, driveways, user traffic and passageways.

1.9. **HAULING OPERATIONS**

1.9.1. Maintain roadways and paving in the hauling areas clean on a daily basis and as required by Municipal Authorities.

1.9.2. Parking is not ample or readily available in the area where the building is located. Coordinate delivery of equipment with the Client representatives.

1.10. **INTERRUPTIONS TO CLIENT'S OPERATIONS**

1.10.1. There will be absolutely no interruptions to the building schedule during demolition Work. Therefore, it is imperative that operations and machine and equipment movements, deliveries and removals are executed at time or times that will permit uninterrupted Client's operations in and around the building, including parking, receiving areas, deliveries and site and means of access and egress.

1.10.2. Where interruptions of utilities are necessary, coordinate with the Client Representatives the timing and duration of such interruptions.

1.11. **SAFETY REQUIREMENTS**

1.11.1. Coordinate posting of danger signs conspicuously around property. Close doorways and thoroughfares giving access to area of demolition with barricades.

1.11.2. Provide a competent, experienced supervisor in charge of the Work and on Site while Work is in progress.

1.11.3. Should any suspect designated substance not already identified, be encountered, cease Work in the immediate area. Contractor is responsible for removal of designated substances.

1.11.4. Secondary ductbank to be installed prior to the removal of the existing service in order to limit the downtime of power to the site.

1.11.5. Complete as much Work as possible for the new service prior to the disconnection of the existing Hydro service

1.12. **WORK INCLUDED IN THIS SECTION**

1.12.1. Remove the two existing boilers as noted on the drawings. Disconnect from existing flue vent, and power supply. Removal of the boilers should be done after the installation of the new heat pump systems.

1.12.2. Temporarily remove the flue duct as required to allow for the installation for the new flue duct for existing DHW tank.

1.12.3. Remove all sections of ductwork, wiring and ductwork made redundant by the replacement of the equipment. Include supports and hangers. Ensure that the gas supply remains available to other equipment not included in this Contract. Temporarily remove smoke detectors and other elements of the fire alarm system; at the conclusion of the Work, reinstate the smoke detectors, reconnect to the fire alarm and test in accordance to the code. If necessary, replace the smoke detectors with new.

1.12.4. Remove all structural support used by the existing equipment to be demolished. Prepare boiler rooms floors for the installation of the new equipment.

1.12.5. Remove all redundant controls, controllers and sensors associated with the equipment to be demolished.

1.12.6. Coordinate the new openings in the exterior wall required for the installation of new refrigerant lines and power conduits with existing Services and envelope features such as windows or other openings.

1.12.7. Prepare the exterior ground as required for the pour of the new concrete pads supporting the new outdoor condensing units.

PART 2 - PRODUCTS

2.1. Not applicable

PART 3 - EXECUTION

3.1. **GENERAL**

3.1.1. At the end of each day's Work, leave site in a safe condition and erect safety barriers and lights as required. Ensure that no parts of the existing building are in danger of collapsing.

3.1.2. Review the requirements of new equipment to be installed. Perform all demolition Work required to allow for the new equipment to be installed, whether shown on the drawings or not.

3.1.3. Provide any additional labor, materials and Services not specifically indicated on the drawings but required to complete the demolition Work.

3.1.4. Do not disturb adjacent structures or equipment designated to remain in place.

3.1.5. Confine operations and workers to those parts of the building which are defined on the drawings and exercise great care not to damage existing Construction beyond that necessary for the carrying out of new Work. Make good any such damage in every respect, to the satisfaction of the Client.

3.2. **DUST CONTROL**

3.2.1. Prevent spread of flying particles and dust. Sprinkle rubbish and debris with water to keep dust to a minimum. Do not use water if it results in hazardous or objectionable condition such as, but not limited to; ice, flooding, or pollution. Vacuum and dust the Work area daily

3.3. **DISPOSAL**

3.3.1. Removed Items

3.3.1.1. Unless otherwise instructed by the Client's representative, all materials from demolition including brick, concrete, stone, metals, insulation, wiring, tubing and similar materials shall be removed

3.3.1.2. Removed items become property of Contractor and shall be disposed of by him daily, off the site to avoid accumulation at the demolition site. Materials that cannot be removed daily shall be stored in areas specified by the Consultant. Contractor shall dispose of all demolition materials in compliance with applicable federal, provincial or local permits, rules and/or regulations.

3.3.1.3. Dispose of demolished materials in accordance with the requirements of Authorities Having Jurisdiction. At the end of demolition Work, leave site in broom-clean condition. Clean existing surfaces specified to receive new applied finishes to ensure proper adherence.

3.3.2. Removed and Salvaged Items:

3.3.2.1. The Client Representative will review the Site prior to commencement of demolition and instruct the Contractor, in writing, as to the items to be Removed and Salvaged. Perform the following:

3.3.2.1.1. Clean salvaged items.
3.3.2.1.2. Pack or crate items after cleaning. Identify contents of containers.
3.3.2.1.3. Store items in a secure area until delivery to Owner.
3.3.2.1.4. Transport items to Owner's storage area location in building.
3.3.2.1.5. Protect items from damage during transport and storage.

3.3.3. Removed and Reinstalled Items:

3.3.3.1. Clean and repair items to functional condition adequate for intended reuse.
3.3.3.2. Pack or crate items after cleaning and repairing. Identify contents of containers.
3.3.3.3. Protect items from damage during transport and storage.
3.3.3.4. Reinstall items in locations indicated. Comply with installation requirements for new materials and equipment. Provide connections, supports, and miscellaneous materials necessary to make item functional for use indicated.

3.3.4. Existing Items to Remain:

3.3.4.1. Protect Construction indicated to remain against damage and soiling during selective demolition. When permitted by Owner's Representative, items may be removed to a suitable, protected storage location off-site during selective demolition and reinstalled in their original locations after selective demolition operations are complete.

3.4. **REFRIGERANTS**

3.4.1. Refrigerant handling requirements shall be as per the applicable by-laws and environmental regulations.

3.5. **DEMOLITION OF ARCHITECTURAL FINISHES**

3.5.1. General: Demolish and remove existing Construction only to the extent required by new Construction and as indicated. Use methods required to complete the Work within limitations of governing regulations and as follows:

3.5.1.1. Neatly cut openings and holes plumb, square, and true to dimensions required. Use cutting methods least likely to damage Construction to remain or adjoining Construction. Use hand tools or small power tools designed for sawing or grinding, not hammering and chopping, to minimize disturbance of adjacent surfaces. Temporarily cover openings to remain.

3.5.1.2. Cut or drill from the exposed or finished side into concealed surfaces to avoid marring existing finished surfaces.

3.5.1.3. Do not use cutting torches without written permission from Client's Representative. Comply with Owner's rules and procedures.

3.5.1.4. Locate selective demolition equipment and remove debris and materials so as not to impose excessive loading on supporting walls, floors, or framing.

3.5.1.5. Dispose of demolished items and materials promptly.

3.5.1.6. Remove all loose material from partially demolished Work leaving only sound and secure Construction.

3.5.2. Plaster:

3.5.2.1. Remove loose plaster that will be exposed in finished Construction. Loose plaster is defined as plaster material of at least 2 inches by 4 inches in size that can be moved by touch or that sounds hollow when lightly tapped with a hammer.

3.5.3. Flooring:

3.5.3.1. Where shown, scheduled or otherwise required for application or installation of new floor finishes or coverings, remove existing flooring tile, resilient sheet flooring as follows:

3.5.3.1.1. Remove all traces of existing flooring materials. Remove resilient sheet and tile flooring products where necessary to install new mechanical equipment.

3.5.3.1.2. Remove adhesives, except those containing asbestos. Use chemical strippers approved by manufacturer of new flooring materials, or grind concrete floor surfaces to completely remove adhesive. Obtain Client's Representative's approval of removal method prior to beginning removal Work.

3.5.3.1.3. Do not remove vinyl composition tile or adhesives suspected of containing asbestos. Contractor will verify asbestos content of questionable materials.

Removal of asbestos-containing adhesives (if any) shall be undertaken by the Contractor.

3.5.3.1.4. Clean floor slabs of dust and adhesive residue.

3.6. **DEMOLITION OF CONCRETE OR ASPHALT**

3.6.1. Water used during concrete and asphalt Work (including sweeping and saw-cutting) must be contained and collected for proper disposal. Do not discharge water containing dust or debris from concrete or asphalt Work into storm drains, catch basins or to the sanitary sewer system.

TABLE OF CONTENTS

PART 1 - GENERAL

1.1. DESCRIPTION

1.1.1. The requirements of this Section apply to all sections of Division 23.

1.2. DEFINITIONS:

1.2.1. Exposed: Piping, ductwork, and equipment exposed to view in finished rooms.
1.2.2. Option or optional: Contractor's choice of an alternate material or method.

1.3. RELATED WORK

1.3.1. Section 01 33 23, SHOP DRAWINGS, PRODUCT DATA
1.3.2. Section 23 05 53, IDENTIFICATION – HVAC SYSTEMS
1.3.3. Section 23 07 11, HVAC INSULATION.

1.4. QUALITY ASSURANCE

1.4.1. Mechanical, electrical and associated systems shall be safe, reliable, efficient, durable, easily and safely operable and maintainable, easily and safely accessible, and in compliance with applicable codes as specified. The systems shall be comprised of high quality institutional-class and industrial-class Products of manufacturers that are experienced specialists in the required Product lines. All construction firms and personnel shall be experienced and qualified specialists in industrial and institutional HVAC

1.5. PRODUCTS CRITERIA:

1.5.1. Standard Products: Material and equipment shall be the standard Products of a manufacturer regularly engaged in the manufacture of the Products for at least 3 years (or longer as specified elsewhere). The design, model and size of each item shall have been in satisfactory and efficient operation on at least three installations for approximately three years. However, digital electronics devices, software and systems such as controls, instruments, computer work station, shall be the current generation of technology and basic design that has a proven satisfactory service record of at least three years. See other specification sections for any exceptions and/or additional requirements.

1.5.2. All items furnished shall be free from defects that would adversely affect the performance, maintainability and appearance of individual components and overall assembly.

1.5.3. Conform to codes and standards as required by the specifications. Conform to local codes, if required by local authorities such as the natural gas supplier, if the local codes are more stringent than those specified. Refer any conflicts to the Consultant.

1.5.4. Multiple Units: When two or more units of materials or equipment of the same type or class are required, these units shall be Products of one manufacturer.

1.5.5. Assembled Units: Manufacturers of equipment assemblies, which use components made by others, assume complete responsibility for the final assembled Product.

1.5.6. Nameplates: Nameplate bearing manufacturer's name or identifiable trademark shall be securely affixed in a conspicuous place on equipment, or name or trademark cast integrally with equipment, stamped or otherwise permanently marked on each item of equipment.

1.5.7. Asbestos Products or equipment or materials containing asbestos shall not be used.

1.6. **EQUIPMENT SERVICE ORGANIZATIONS:**

1.6.1. HVAC: Products and systems shall be supported by service organizations that maintain a complete inventory of repair parts and are located within 50 km to the site.

1.6.2. HVAC Mechanical Systems Welding: Before any welding is performed, Contractor shall submit a certificate certifying that welders comply with the following requirements:

1.7. **EXECUTION (INSTALLATION, CONSTRUCTION) QUALITY:**

1.7.1. Apply and install all items in accordance with manufacturer's written instructions. Refer conflicts between the manufacturer's instructions and the Contract drawings and specifications to the Consultant for resolution.

1.7.2. Provide complete layout drawings, schematics, diagrams, sections, notes and specifications as required to allow for competitive Bidding and construction. Do not commence construction Work on any system until the layout drawings have been approved.

1.8. **DUTIES OF MECHANICAL CONTRACTOR**

1.8.1. The mechanical Contractor shall assume the responsibilities and duties of a general Contractor including but not limited to the ones described below:

1.8.2. Superintendence

1.8.2.1. Provide full time on-site superintendent personnel and supporting staff with proven experience in project of similar value and complexity.

1.8.2.2. Site superintendent shall have over-all authority to speak for and represent the mechanical Contractor.

1.8.3. Coordination

1.8.3.1. Coordinate the Work with all the sub-trades involved to ensure that the Work will be carried out on schedule and in proper sequence.

1.8.3.2. Take complete responsibility for all remedial Work that results from failure to coordinate any aspect of the mechanical Work prior to its fabrication and/or installation.

1.8.3.3. Take responsibility for the delivery of equipment necessary to complete the Work in accordance with the approved schedule.

1.8.4. Staffing and Scheduling

1.8.4.1. Within seven days after the Award of the Contract, the Mechanical Contractor shall provide to the Client representative the following information:

1.8.4.1.1. Appointment of official representatives in the project.
1.8.4.1.2. Schedule of Work.
1.8.4.1.3. Delivery schedule for specified equipment.
1.8.4.1.4. Requirements for temporary facilities, site signs, storage, etc.

1.8.5. Work Completion Meeting

1.8.5.1. Prior to application for Substantial Performance of the Work, the mechanical Contractor shall participate in the take-over meeting. Agenda to include the following:

1.8.5.1.1. Review of outstanding deficiencies.

1.8.5.1.2. Submission of maintenance manuals, warranties and as-built drawings.

1.8.5.1.3. Results of performance tests and described further in this section.

1.8.5.1.4. Scheduling of training to Client's personnel.

1.9. **COMMISSIONING**

1.9.1. The Client may at its discretion use a third party as a commissioning agent for the construction portion of the Work. The requirement for commissioning shall be included in the front-end documents of the Bidders' package.

1.9.2. If commissioning is included, the Contractor shall provide all manpower and will take into account all the hours required to participate in the commissioning process including meetings with the commissioning agent, completion of forms and check-lists, verifications, simulations, rectifications of deficiencies and other activities associated with the commissioning process.

1.10. **SCHEDULING OF WORK**

1.10.1. For all Work to be performed under this Contract, adhere to Construction Schedule agreed upon with the Client.

1.11. **INTENT**

1.11.1. Bidders for this Work shall include for all labor, material, equipment and all other related cost including all applicable taxes (except HST) and fees to provide the Work as indicated on the drawings.

1.11.2. Misinterpretation of any requirement of the drawings and specifications will not relieve the Mechanical Contractor of responsibility. If in any doubt, the Mechanical Contractor shall contact the Consultant for written clarification prior to submitting a Bid for the Work.

1.11.3. Install new heat pumps, electric heaters, and AC units, in each residential unit, and install the new boiler in each boiler room as indicated on the drawings.

1.11.4. Install new flue duct for existing DHW tank, use existing flue opening and repair opening as required, as indicated on the drawings.

1.12. **INTERFERENCES**

1.12.1. The mechanical drawings do not show all the architectural and structural details, and any information involving accurate measuring of the building shall be taken from the building drawings or at the building. Make without additional change, any necessary changes or additions to the runs of drains, pipes, ducts, etc., to accommodate the above conditions. The location of equipment may be altered without charge providing the change is made before installation and does not necessitate major additional material.

1.12.2. Wherever differences occur between specifications, riser diagrams or schematics and drawings, the maximum conditions shall govern and the Bid shall be based on whichever information indicates the greater cost.

1.12.3. Field verifications of dimensions on plans shall be made since actual locations, distances, and levels will be governed by actual field conditions.

1.12.4. Discrepancies between different plans, or between plans and actual field conditions, or between plans and specifications shall promptly be brought to the attention of the Consultant for a decision.

1.12.5. Install all mechanical Services including but not exclusive to drains, pipes, and ducts, to conserve headroom and interfere as little as possible with the free use of the space through which they pass. All drains, pipes, ducts, etc., particularly those which may interfere with the inside treatment of the building, or conflicting with other trades, shall be installed only after the locations have been approved by the Consultant. Special care shall be taken in the installation of all mechanical Services including, but not exclusive to drains, pipes, and ducts, which are to be concealed, to see that they come within the finished lines of floors, walls, and ceilings. Where such drains, pipes, ducts, etc., have been installed in such a manner as to cause interference, they shall be removed and re installed in suitable locations without extra cost to the Client.

1.12.6. Before commencing Work, check and verify all grade and invert elevations, stacks, levels, and dimensions, to ensure proper and correct installation of the Work.

1.12.7. In every place where there is space indicated as reserved for future or other equipment, leave such space clear, install blank offs, shut off valves with blind flanges and other Work so that the necessary connections can be made without any stoppages to the system. Consult with the consultant whenever necessary for this purpose.

1.12.8. In addition to the Work specifically mentioned in the Specifications and shown on the drawings, provide all other items that are obviously necessary to make a complete working installation, including those required by the Authorities Having Jurisdiction over the Work.

1.12.9. The mechanical plans show approximate locations for wall mounted devices. Obtain Consultant's approval of mounting heights and locations before commencement of Work.

1.13. **EXAMINE SITE**

1.13.1. Examine the site and the local conditions affecting the Work prior to submission of the Request for Proposal price. Examine carefully all drawings and the complete specifications to ensure that the Work can be satisfactorily carried out as shown. No allowance will be made later for any expenses incurred through the failure to make these examinations or to report any such discrepancies in writing to the Consultant.

1.13.2. Examine the prevailing conditions surrounding the proposed location of the new condensing units. Establish on site the final location of the new condensing units and routing of new refrigerant lines and power conduits to minimize impact on landscaping.

1.13.3. Coordinate the Work with the structural drawings the location and size of the concrete pad for the new condensing units and the location of the pavers for the pipe/conduits.

1.13.4. Coordinate on site the final location of the new exterior wall penetrations for the refrigerant lines and power conduits relative to existing building elements, other existing Services, the make-up air unit intake louver and existing electrical conduits.

1.14. **INTERFERENCE AND SLEEVING DRAWINGS:**

1.14.1. N/A

1.15. **WARRANTY**

1.15.1. All Work completed under this Contract shall carry a min. 1 year warranty (labor and material) from the date of substantial completion.

1.15.2. Where certain equipment specifications call for a for a longer warranty on certain components, the longest period shall apply

1.16. **SUBMITTALS**

1.16.1. Submit documentation in accordance with Section 01 23 33, and with requirements in the individual specification sections.

1.16.2. Contractor shall make all necessary field measurements and investigations to assure that the equipment and assemblies will meet Contract requirements.

1.16.3. If equipment is submitted which differs in arrangement from that shown, provide drawings that show the rearrangement of all associated systems. Approval will be given only if all features of the equipment and associated systems, including accessibility, are equivalent to that required by the Contract.

1.16.4. Prior to submitting shop drawings for approval, Contractor shall certify in writing that manufacturers of all major items of equipment have each reviewed drawings and specifications, and have jointly coordinated and properly integrated their equipment and controls to provide a complete and efficient installation.

1.16.5. Submittals and shop drawings for interdependent items, containing applicable descriptive information, shall be furnished together and complete in a group. Coordinate and properly integrate materials and equipment in each group to provide a completely compatible and efficient.

1.16.6. Manufacturer's Literature and Data:

1.16.6.1. Submit all information pertaining to the performance and capacity of the equipment.
1.16.6.2. Submit all information pertaining to methods of connection to piping and ductwork, electrical wiring, controls and noise generated by the equipment (as applicable to the project).
1.16.6.3. Submit belt drive with the driven equipment. Submit selection data for specific drives when requested by the Consultant.
1.16.6.4. Submit electric motor data and variable speed drive data with the driven equipment.
1.16.6.5. Equipment and materials identification.
1.16.6.6. Fire-stopping materials.
1.16.6.7. Hangers, inserts, supports and bracing, for both indoor and outdoor installations. Where applicable, provide load ratings and deflection for spring supports and hangers.
1.16.6.8. Wall, floor, and ceiling plates.

1.16.7. HVAC Maintenance Data and Operating Instructions:

1.16.7.1. Provide a listing of recommended replacement parts for keeping in stock supply, including sources of supply, for equipment. Include in the listing belts for equipment: Belt manufacturer, model number, size and style, and distinguished whether of multiple belt sets.

1.16.7.2. Provide copies of approved HVAC equipment submittals to the Testing, Adjusting and Balancing Subcontractor.

1.17. **MATERIALS AND STANDARDS OF ACCEPTANCE**

1.17.1. Where materials, equipment, apparatus, or other Products are specified by the manufacturer, brand name, type or catalogue number, such designation is to establish standards of desired quality style or dimensions and shall be the basis of the Bid. Materials so specified shall be furnished under this Contract.

1.17.2. Where two or more designations are listed, the Contractor shall choose one of those listed and state the choice made on the Bid Form (where applicable). *Note that the basis of design equipment has specific physical characteristics in terms of footprint and clearances requirements. Inclusion of a manufacturer other than the one for the Basis of Design in the Standard of Acceptance is not an automatic approval for submission of equipment which cannot be installed due to specific site conditions.*

1.18. **MATERIAL SUBSTITUTIONS**

1.18.1. After execution of the Contract, requests for substitution of materials or makes other than those specifically named in the Contract Documents may be reviewed and approved by the Consultant, subject to Client's review and acceptance of the financial credits involved.

1.18.2. In the absence of such express approval by the Consultant, the Mechanical Contractor will be held to furnish specified items under the base Bid as the standard of acceptance.

1.18.3. If equipment is submitted which differs in arrangement from that specified/shown on the documents, provide drawings that show the rearrangement of all associated systems. Approval will be given only if all features of the equipment and associated systems, including accessibility, are equivalent to that required by the Contract.

1.19. **CODES, PERMITS, FEES AND CONNECTIONS**

1.19.1. Conform to Federal, Provincial and Municipal regulations and perform Work in accordance with requirements of By Laws and Regulations in force in area where the Work will take place.

1.19.2. Apply for, obtain, and pay for all permits, fees and service connections for the Work and the inspections required by Authorities Having Jurisdiction in the area where the Work will take place

1.19.3. Where applicable, apply for, obtain, and pay for all permits, fees and service connections for the Work and the inspections required by Authorities Having Jurisdiction in the area where the Work will take place, including TSSA and ESA. Where applicable, have the Work inspected and certified by PV [Boilers and Pressure Vessels Reg], OE [Operating Engineers Reg.] and FS [Fuel Safety Reg.] branches of TSSA. At the end of the Work, the new plant shall be fully TSSA certified.

1.19.4. For information, a specific code or standard might be mentioned. This information must not be taken as the only code or standard applicable.

1.19.5. When part of equipment does not bear the required CSA label, the Contractor shall obtain from CSA or Hydro Electric Power Commission, when that part of the equipment is an electric component, a special approval and pay the applicable fees.

1.19.6. Furnish necessary certificates as evidence that the Work installed conforms with laws and regulations of Authorities having jurisdiction. Changes in Work requested by an Authority having jurisdiction shall be carried out without charge.

1.20. **CONSULTANT'S INSTRUCTIONS**

1.20.1. During construction the Consultant will issue such instructions as may be necessary for verification and correction of the Work. These instructions shall be binding as part of the specification.

1.21. **ADDITIONAL WORK AND CHANGES**

1.21.1. Unless a written order, reviewed by the Consultant and countersigned or otherwise approved by the Client Representative, no additional Work shall be undertaken by the Contractor.

1.22. **DELIVERY, STORAGE AND HANDLING**

1.22.1. Protection of Equipment:

1.22.1.1. Equipment and material placed on the job site shall remain in the custody of the Contractor until phased acceptance, whether or not the Client has reimbursed the Contractor for the equipment and material. The Contractor is solely responsible for the protection of such equipment and material against any damage.

1.22.1.2. Place damaged equipment in first class, new operating condition; or, replace same as determined and directed by the Consultant. Such repair or replacement shall be at no additional cost to the Client.

1.22.1.3. Protect interiors of new equipment and piping systems against entry of foreign matter. Clean both inside and outside before painting or placing equipment in operation.

1.22.1.4. Existing equipment and piping being worked on by the Contractor shall be under the custody and responsibility of the Contractor and shall be protected as required for new Work.

1.22.2. Cleanliness of Piping and Equipment Systems:

1.22.2.1. Exercise care in storage and handling of equipment and piping material to be incorporated in the Work. Remove debris arising from cutting, threading and welding of piping.

1.22.2.2. Piping systems shall be flushed, blown or pigged as necessary to deliver clean systems.

1.22.2.3. Clean interior of all tanks prior to delivery for beneficial use by the Client.

1.22.2.4. Boilers shall be left clean following final internal inspection by Client insurance representative or inspector.

1.22.2.5. Contractor shall be fully responsible for all costs, damage, and delay arising from failure to provide clean systems.

1.23. **JOB CONDITIONS – WORK IN EXISTING BUILDING**

1.23.1. Building Operation: Client employees will be continuously operating and managing all facilities, including temporary facilities, that serve the building.

1.23.2. Maintenance of Service: Schedule all Work to permit continuous service as required by the Client.

1.23.3. Services Interruptions: Limited service interruptions, as required for interconnections of new and existing systems, will be coordinated with the Client and permitted by the Client during the agreed-upon schedule of interruption. Provide at least one week advance notice to the Client representatives.

1.23.4. Phasing of Work: Comply with all requirements shown on drawings or specified.

1.23.5. Building Working Environment: Maintain the architectural and structural integrity of the building and the working environment at all times. Maintain the interior of building at 18 degrees C (65 degrees F) minimum. Limit the opening of doors, windows or other access openings to brief periods as necessary for rigging purposes. No storm water or ground water leakage permitted. Provide daily clean up of construction and demolition debris on all floor surfaces and on all equipment being operated by the Client.

1.23.6. Acceptance of Work for Client Operation: As new facilities are made available for operation and these facilities are of beneficial use to the Client, inspections will be made and tests will be performed. Based on the inspections, a list of Contract deficiencies will be issued to the Contractor. After correction of deficiencies as necessary for beneficial use, the Consultant will process necessary acceptance and the equipment will then be under the control and operation of Client personnel.

PART 2 - PRODUCTS

2.1. FACTORY-ASSEMBLED PRODUCTS

2.1.1. Provide maximum standardization of components to reduce spare part requirements.

2.1.2. Manufacturers of equipment assemblies that include components made by others shall assume complete responsibility for final assembled unit.

2.1.3. All components of an assembled unit need not be Products of same manufacturer.

2.1.4. Constituent parts that are alike shall be Products of a single manufacturer.

2.1.5. Components shall be compatible with each other and with the total assembly for intended service.

2.1.6. Contractor shall guarantee performance of assemblies of components, and shall repair or replace elements of the assemblies as required to deliver specified performance of the complete assembly.

2.1.7. Components of equipment shall bear manufacturer's name and trademark, model number, serial number and performance data on a name plate securely affixed in a

conspicuous place, or cast integral with, stamped or otherwise permanently marked upon the components of the equipment.

2.1.8. Major items of equipment, which serve the same function, must be the same make and model. Exceptions will be permitted if performance requirements cannot be met.

2.2. **COMPATIBILITY OF RELATED EQUIPMENT**

2.2.1. Equipment and materials installed shall be compatible in all respects with other items being furnished and with existing items so that the result will be a complete and fully operational plant that conforms to Contract requirements.

2.3. **BELT DRIVES**

2.3.1. Type: ANSI/RMA standard V belts with proper motor pulley and driven sheave. Belts shall be constructed of reinforced cord and rubber.

2.3.2. Dimensions, rating and selection standards: ANSI/RMA IP 20 and IP 21.

2.3.3. Minimum Horsepower Rating: Motor horsepower plus recommended ANSI/RMA service factor (not less than 20 percent) in addition to the ANSI/RMA allowances for pitch diameter, center distance, and arc of contact.

2.3.4. Maximum Speed: 25 m/s (5000 feet per minute).

2.3.5. Adjustment Provisions: For alignment and ANSI/RMA standard allowances for installation and take up.

2.3.6. Drives may utilize a single V Belt (any cross section) when it is the manufacturer's standard.

2.3.7. Multiple Belts: Matched to ANSI/RMA specified limits by measurement on a belt measuring fixture. Seal matched sets together to prevent mixing or partial loss of sets. Replacement, when necessary, shall be an entire set of new matched belts.

2.3.8. Sheaves and Pulleys:

2.3.8.1. Material: Pressed steel, or close grained cast iron.
2.3.8.2. Bore: Fixed or bushing type for securing to shaft with keys.
2.3.8.3. Balanced: Statically and dynamically.
2.3.8.4. roove spacing for driving and driven pulleys shall be the same.

2.3.8.5. Drive Types, Based on ARI 435:

2.3.9. Provide adjustable pitch or fixed pitch drive as follows:

2.3.9.1. Fan speeds up to 1800 RPM: 7.5 kW (10 horsepower) and smaller.
2.3.9.2. Fan speeds over 1800 RPM: 2.2 kW (3 horsepower) and smaller.
2.3.9.3. Provide fixed pitch drives for drives larger than those listed above.

2.3.10. The final fan speeds required to just meet the system CFM and pressure requirements, without throttling, shall be determined by adjustment of a temporary adjustable pitch motor sheave or by fan law calculation if a fixed pitch drive is used initially.

2.4. **DRIVE GUARDS**

2.4.1. For machinery and equipment, provide guards as shown in AMCA 410 for belts, chains, couplings, pulleys, sheaves, shafts, gears and other moving parts regardless of height above the floor to prevent damage to equipment and injury to personnel. Drive guards may be excluded where motors and drives are inside factory fabricated air handling unit casings.

2.4.2. Pump shafts and couplings shall be fully guarded by a sheet steel guard, covering coupling and shaft but not bearings. Material shall be minimum 16-gage sheet steel; ends shall be braked and drilled and attached to pump base with minimum of four 6 mm (1/4-inch) bolts. Reinforce guard as necessary to prevent side play forcing guard onto couplings.

2.4.3. V-belt and sheave assemblies shall be totally enclosed, firmly mounted, non-resonant. Guard shall be an assembly of minimum 22-gage sheet steel and expanded or perforated metal to permit observation of belts. 25 mm (one-inch) diameter hole shall be provided at each shaft centerline to permit speed measurement.

2.4.4. Materials: Sheet steel, cast iron, expanded metal or wire mesh rigidly secured so as to be removable without disassembling pipe, duct, or electrical connections to equipment.

2.4.5. Access for Speed Measurement: 25 mm (One inch) diameter hole at each shaft center.

2.5. **LIFTING ATTACHMENTS**

2.5.1. Provide equipment with suitable lifting attachments to enable equipment to be lifted in its normal position. Lifting attachments shall withstand any handling conditions that

might be encountered, without bending or distortion of shape, such as rapid lowering and braking of load.

2.6. EQUIPMENT REQUIREMENTS AND INSTALLATION

2.6.1. Permit equipment maintenance and disassembly by use of unions or flanges to minimize disturbance to connecting piping and duct systems and without interference from building structure or other equipment.

2.6.2. Provide accessible means for lubricating equipment including permanent lubricated bearings.

2.6.3. For all base mounted boilers, pumps, compressors, air handling units, fans and other rotating equipment, provide chamfered edge housekeeping pads a minimum of 4" high and 4" larger than equipment dimensions all around. Work shall be performed by the trades specializing in this Work.

2.6.4. Pipe drain lines, overflows and safety relief vents to drains. If the horizontal drains present a tripping hazard, use aluminum checkered plate covers.

2.6.5. Line up equipment, rectangular cleanouts and similar items with building walls wherever possible.

2.7. ELECTRIC MOTORS

2.7.1. Provide all electrical wiring, conduit, and devices necessary for the proper connection, protection and operation of the systems. Provide special energy efficient premium efficiency type motors as scheduled.

2.8. EQUIPMENT AND MATERIALS IDENTIFICATION

2.8.1.1. Refer to section 23 05 53

2.9. FIRESTOPPING

2.9.1. Provide either factory built (Firestop Devices) or field installed (through-Penetration Firestop Systems) to form a specific building system maintaining required integrity of the fire barrier and stop the passage of gases or smoke. Firestop systems to accommodate building movements without impairing their integrity.

2.9.2. Through-penetration firestop systems and firestop devices tested in accordance with ASTM E814 or UL 1479 using the "F" or "T" rating to maintain the same rating and integrity as the fire barrier being sealed. "T" ratings are not required for penetrations smaller than or equal to 101 mm (4 inches) nominal pipe or 0.01 square meter (16 square inches) in overall cross sectional area.

2.9.3. Firestop sealants used for firestopping or smoke sealing to have the following properties:

2.9.3.1. Contain no flammable or toxic solvents.
2.9.3.2. Release no dangerous or flammable out gassing during the drying or curing of Products.
2.9.3.3. Water-resistant after drying or curing and unaffected by high humidity, condensation or transient water exposure.
2.9.3.4. When installed in exposed areas, capable of being sanded and finished with similar surface treatments as used on the surrounding wall or floor surface.

2.9.4. Firestopping system or devices used for penetrations by glass pipe, plastic pipe or conduits, unenclosed cables, or other non-metallic materials to have following properties:

2.9.4.1. Classified for use with the particular type of penetrating material used.
2.9.4.2. Penetrations containing loose electrical cables, computer data cables, and communications cables protected using firestopping systems that allow unrestricted cable changes without damage to the seal.

2.9.5. Maximum flame spread of 25 and smoke development of 50 when tested in accordance with ASTM E84 or UL 723. Material to be an approved firestopping material as listed in UL Fire Resistance Directory or by a nationally recognized testing laboratory.

2.9.6. FM, UL, or WH rated or tested by an approved laboratory in accordance with ASTM E814.

2.9.7. Materials to be nontoxic and noncarcinogen at all stages of application or during fire conditions and to not contain hazardous chemicals. Provide firestop material that is free from Ethylene Glycol, PCB, MEK, and asbestos.

2.9.8. For firestopping exposed to view, traffic, moisture, and physical damage, provide Products that do not deteriorate when exposed to these conditions.

2.9.8.1. For piping penetrations for plumbing and wet-pipe sprinkler systems, provide moisture-resistant through-penetration firestop systems.

2.9.8.2. For floor penetrations with annular spaces exceeding 101 mm (4 inches) or more in width and exposed to possible loading and traffic, provide firestop systems capable of supporting the floor loads involved either by installing floor plates or by other means acceptable to the firestop manufacturer.

2.9.8.3. For penetrations involving insulated piping, provide through-penetration firestop systems not requiring removal of insulation.

2.10. **GALVANIZED REPAIR COMPOUND**

2.10.1. N/A.

2.11. **HVAC PIPE AND EQUIPMENT SUPPORTS AND RESTRAINTS**

2.11.1. Supports for Roof Mounted Items:

2.11.1.1. Equipment: Refer to details on mechanical and structural drawings and section 07 70 00.

2.11.1.2. Pipe Supports: Refer to details on the drawings and section 07 70 00.

2.11.1.3. Supports for Indoor Mounted Items

2.11.1.3.1. Attachment to Concrete Building Construction:

- Concrete insert: MSS SP-58, Type 18.
- Self drilling expansion shields and machine bolt expansion anchors: Permitted in concrete not less than 102 mm (four inches) thick when approved by the Consultant for each job condition.
- Power driven fasteners: Permitted in existing concrete or masonry not less than 102 mm (four inches) thick when approved by the Consultant for each job condition.

2.11.1.3.2. Attachment to Steel Building Construction:

- Welded attachment: MSS SP 58, Type 22.
- Beam clamps: MSS SP-58, Types 20, 21, 28 or 29. Type 23 C clamp may be used for individual copper tubing up to 23mm (7/8 inch) outside diameter.

2.11.1.3.3. Attachment to existing structure: Support from existing floor/roof frame

- Attachment to Wood Construction: Wood screws or lag bolts.
- Hanger Rods: Hot rolled steel, ASTM A36 or A575 for allowable load listed in MSS SP 58. For piping, provide adjustment means for controlling level or slope. Types 13 or 15 turn buckles shall provide 38 mm (1 1/2 inches) minimum of adjustment and incorporate locknuts. All thread rods are acceptable.

2.11.1.3.4. Hangers Supporting Multiple Pipes (Trapeze Hangers): Galvanized, cold formed, lipped steel channel horizontal member, not less than 41 mm by 41 mm (1 5/8 inches by 1 5/8 inches), 2.7 mm (No. 12 gage), designed to accept special spring held, hardened steel nuts. Not permitted for steam supply and condensate piping.

2.11.1.3.5. Allowable hanger load: Manufacturers rating less 91kg (200 pounds).

2.11.1.3.6. Guide individual pipes on the horizontal member of every other trapeze hanger with 6 mm (1/4 inch) U bolt fabricated from steel rod. Provide Type 40 insulation shield, secured by two 13mm (1/2 inch) galvanized steel bands, or preinsulated calcium silicate shield for insulated piping at each hanger.

2.11.2. Supports for Piping Systems:

2.11.2.1. Select hangers sized to encircle insulation on insulated piping. Refer to Section 23 07 11 for insulation thickness. To protect insulation, provide Type 39 saddles for roller type supports or pre-insulated calcium silicate shields. Provide Type 40 insulation shield or pre-insulated calcium silicate shield at all other types of supports and hangers including those for pre-insulated piping.

2.11.3. Piping Systems (MSS SP 58):

2.11.3.1. Standard clevis hanger: Type 1; provide locknut.
2.11.3.2. Riser clamps: Type 8.
2.11.3.3. Wall brackets: Types 31, 32 or 33.
2.11.3.4. Roller supports: Type 41, 43, 44 and 46.
2.11.3.5. Saddle support: Type 36, 37 or 38.
2.11.3.6. Turnbuckle: Types 13 or 15. Preinsulate.
2.11.3.7. U bolt clamp: Type 24.

2.11.4. Copper Tube:

2.11.4.1. Hangers, clamps and other support material in contact with tubing shall be painted with copper colored epoxy paint, plastic coated or taped with non-adhesive isolation tape to prevent electrolysis.

2.11.4.2. For vertical runs use epoxy painted or plastic coated riser clamps.

2.11.4.3. For supporting tube to strut: Provide epoxy painted pipe straps for copper tube or plastic inserted vibration isolation clamps.

2.11.5. Insulated Lines: Provide pre-insulated calcium silicate shields sized for copper tube.

2.11.6. Supports for plastic or glass piping: As recommended by the pipe manufacturer with black rubber tape extending one inch beyond steel support or clamp.

2.11.7. Piping with Vertical Expansion and Contraction:

2.11.7.1. Movement up to 20 mm (3/4 inch): Type 51 or 52 variable spring unit with integral turn buckle and load indicator.

2.11.7.2. Movement more than 20 mm (3/4 inch): Type 54 or 55 constant support unit with integral adjusting nut, turn buckle and travel position indicator.

2.11.7.3. Convertor and Expansion Tank Hangers: May be Type 1 sized for the shell diameter. Insulation where required will cover the hangers.

2.11.8. For pipe sizes larger than (50 mm) 2-inches:

2.11.8.1. Pre-insulated Calcium Silicate Shields:

2.11.8.1.1. Provide 360 degree water resistant high density 965 kPa (140 psi) compressive strength calcium silicate shields encased in galvanized metal.

2.11.8.1.2. Pre-insulated calcium silicate shields to be installed at the point of support during erection.

2.11.8.1.3. Shield thickness shall match the pipe insulation.

2.11.8.1.4. The type of shield is selected by the temperature of the pipe, the load it must carry, and the type of support it will be used with.

2.11.8.1.5. Shields for supporting chilled or cold water shall have insulation that extends a minimum of 1 inch past the sheet metal. Provide for an adequate vapor barrier in chilled lines.

2.11.8.1.6. The pre-insulated calcium silicate shield shall support the maximum allowable water filled span as indicated in MSS-SP 69. To support the load, the shields may have one or more of the following features: structural inserts 4138 kPa (600 psi) compressive strength, an extra bottom metal shield, or formed structural steel (ASTM A36) wear plates welded to the bottom sheet metal jacket.

2.11.8.1.7. Shields may be used on steel clevis hanger type supports, roller supports or flat surfaces

2.12. PIPE PENETRATIONS – ROOFS

2.12.1. N/A

2.13. PIPE PENETRATIONS THROUGH BUILDING ELEMENTS

2.13.1. Install sleeves during construction for other than blocked out floor openings for risers in mechanical bays.

2.13.2. To prevent accidental liquid spills from passing to a lower level, provide the following:

2.13.2.1. For vertical sleeves: Extend sleeve 25 mm (one inch) above finished floor and provide sealant for watertight joint.

2.13.2.2. For blocked out floor openings: Provide 40 mm (1½ inch) angle set in silicone adhesive around opening.

2.13.2.3. For drilled penetrations: Provide 40 mm (1½ inch) angle ring or square set in silicone adhesive around penetration.

2.13.3. Penetrations are not allowed through beams or ribs, but may be installed in concrete beam flanges. Any deviation from these requirements must receive prior approval of Consultant.

2.13.4. Sheet Metal, Plastic, or Moisture resistant Fiber Sleeves: Provide for pipe passing through floors, interior walls, and partitions, unless brass or steel pipe sleeves are specifically called for below.

2.13.5. Cast Iron or Zinc Coated Pipe Sleeves: Provide for pipe passing through exterior walls. Make space between sleeve and pipe watertight and provide fire stopping to maintain wall rating. Sealing shall be applied at both ends of sleeve.

2.13.6. Galvanized Steel or an alternate Black Iron Pipe with asphalt coating Sleeves: Provide for pipe passing through concrete beam flanges, except where brass pipe sleeves are called for. Provide sleeve for pipe passing through floor of mechanical rooms, laundry Work rooms, and animal rooms above basement. Except in mechanical rooms, connect sleeve with floor plate.

2.13.7. Brass Pipe Sleeves: Provide for pipe passing through quarry tile, terrazzo or ceramic tile floors. Connect sleeve with floor plate.

2.13.8. Sleeves are not required for wall hydrants for fire department connections or in drywall construction.

2.13.9. Sleeve Clearance: Sleeve through floors, walls, partitions, and beam flanges shall be one inch greater in diameter than external diameter of pipe. Sleeve for pipe with insulation shall be large enough to accommodate the insulation. Interior openings shall be caulked tight with fire stopping material and sealant to prevent the spread of fire, smoke, and gases.

2.14. **DUCT PENETRATIONS - ROOFS**

2.14.1. N/A

2.15. **DUCT PENETRATIONS – INTERIOR BUILDING ELEMENTS**

2.15.1. Provide sheet metal sleeves min 150 mm (6”) raised above the penetrated floors. Seal space between sleeves and ducts.

2.15.2. For penetrations through fire rated building elements, refer to details on the drawings.

2.15.3. Provide firestopping for openings through fire and smoke barriers, maintaining minimum required rating of floor, ceiling or wall assembly.

2.16. **SPECIAL TOOLS AND LUBRICANTS**

2.16.1. Furnish, and turn over to the Client, tools not readily available commercially, that are required for disassembly or adjustment of equipment and machinery furnished.

2.16.2. Grease Guns with Attachments for Applicable Fittings: One for each type of grease required for each motor or other equipment.

2.16.3. Refrigerant Tools: Provide system charging/Evacuation equipment, gauges, fittings, and tools required for maintenance of furnished equipment.

2.16.4. Tool Containers: Hardwood or metal, permanently identified for in tended service and mounted, or located, where directed by the Consultant.

2.16.5. Lubricants: A minimum of 0.95 L (one quart) of oil, and 0.45 kg (one pound) of grease, of equipment manufacturer's recommended grade and type, in unopened containers and properly identified as to use for each different application.

2.17. **WALL, FLOOR AND CEILING PLATES**

2.17.1. Material and Type: Chrome plated brass or chrome plated steel, one piece or split type with concealed hinge, with set screw for fastening to pipe, or sleeve. Use plates that fit tight around pipes, cover openings around pipes and cover the entire pipe sleeve projection.

2.17.2. Thickness: Not less than 2.4 mm (3/32 inch) for floor plates. For wall and ceiling plates, not less than 0.64 mm (0.025-inch) for up to 80 mm (3 inch pipe), 0.89 mm (0.035-inch) for larger pipe.

2.17.3. Locations: Use where pipe penetrates floors, walls and ceilings in exposed locations, in finished areas only. Provide a watertight joint in spaces where brass or steel pipe sleeves are specified.

PART 3 - EXECUTION

3.1. **ARRANGEMENT AND INSTALLATION OF EQUIPMENT AND PIPING**

3.1.1. Coordinate location of piping, sleeves, inserts, hangers, ductwork and equipment. Locate piping, sleeves, inserts, hangers, ductwork and equipment clear of windows, doors, openings, light outlets, and other Services and utilities. Prepare equipment layout drawings to coordinate proper location and personnel access of all facilities. Submit the interference drawings for review as required by Part 1. Follow manufacturer's published recommendations for installation methods not otherwise specified.

3.1.2. Operating Personnel Access and Observation Provisions: Select and arrange all equipment and systems to provide clear view and easy access, without use of portable ladders, for maintenance and operation of all devices including but not limited to, temperature gauges, pressure sensors, all equipment items, valves, filters, strainers, transmitters, sensors, control devices. All gages and indicators shall be clearly visible by personnel standing on the floor or on permanent platforms. Do not reduce or change maintenance and operating space and access provisions that are shown on the drawings.

3.2. **THERMOMETERS AND PRESSURE GAUGES**

3.2.1. General:

3.2.1.1. Locate direct reading thermometers and gauges for reading from floor or platform.

3.2.1.2. Provide remote reading thermometers and gauges where direct reading instruments cannot be satisfactorily located.

3.2.1.3. Locate engraved lamacoid nameplate as specified in Section Identification, identifying medium adjacent to thermometers and gauges.

3.2.2. Thermometers:

3.2.2.1. Industrial, 9" adjustable angle cast aluminum case, CGSB standard CAN/CGSB-14.4-M88 red reading mercury, lens front tube, white scale black embossed figures, clear glass or acrylic window, tapered aluminum stem.

3.2.2.2. Scale shall be suitable for 2 times the temperature range of service. Scale shall be combined Celsius and Fahrenheit.

3.2.2.3. Standard of Acceptance: Weiss, Ashcroft, Trerice.

3.2.3. Pressure Gauges:

3.2.3.1. 5" dial, solid front blow out back, fibreglass reinforced polypropylene case, phosphor bronze bourdon tube and brass 1/4" N.P.T. socket, bottom connection, stainless steel rotary type movement, gauge to be registered with the Provincial Boiler and Pressure Vessel Safety Branch with a registration number and conform to ANSI B40.1. Accuracy to be grade "A".

3.2.3.2. On pumps liquid filled gauges shall be utilized.

3.2.3.3. Standard of Acceptance: Weiss, Ashcroft, Trerice.

3.2.3.4. Provide bronze stop cock, bronze bar stock ¼" N.P.T. bronze porous core pressure snubber for pulsating operation and diaphragm for corrosive service.

3.2.3.5. Use materials compatible with system requirements.

3.2.4. Gauges shall have combined kilopascal and psi scales.

3.3. EQUIPMENT AND PIPING SUPPORT

3.3.1. Coordinate structural systems necessary for pipe and equipment support with pipe and equipment locations to permit proper installation.

3.3.2. Location of pipe sleeves, trenches and chases shall be accurately coordinated with equipment and piping locations.

3.3.3. Cutting Holes:

3.3.3.1. Cut holes through concrete and masonry by rotary core drill. Pneumatic hammer, impact electric, and hand or manual hammer type drill will not be allowed, except as permitted by Consultant where working area space is limited.

3.3.3.2. Locate holes to avoid interference with structural members such as beams or grade beams. Holes shall be laid out in advance and drilling done only after approval by Consultant. If the Contractor considers it necessary to drill through structural members, this matter shall be referred to Consultant for approval.

3.3.3.3. Do not penetrate membrane waterproofing.

3.4. **ITEMS NOT SHOWN BUT REQUIRED**

3.4.1. Interconnection of Instrumentation or Control Devices: Generally, electrical and pneumatic interconnections are not shown but must be provided.

3.4.2. Minor Piping: Generally, small diameter pipe runs from drips and drains, water cooling, and other service are not shown but must be provided.

3.4.3. Electrical and Pneumatic Interconnection of Controls and Instruments: This generally not shown but must be provided. This includes interconnections of sensors, transmitters, transducers, control devices, control and instrumentation panels, instruments and computer workstations. Comply with NFPA-70.

3.5. **PROTECTION AND CLEANING:**

3.5.1. Equipment and materials shall be carefully handled, properly stored, and adequately protected to prevent damage before and during installation, in accordance with the manufacturer's recommendations and as approved by the Consultant. Damaged or defective items in the opinion of the Consultant, shall be replaced.

3.5.2. Protect all finished parts of equipment, such as shafts and bearings where accessible, from rust prior to operation by means of protective grease coating and wrapping. Close pipe openings with caps or plugs during installation. Tightly cover and protect fixtures and equipment against dirt, water chemical, or mechanical injury. At completion of all Work thoroughly clean fixtures, exposed materials and equipment.

3.6. **WORK IN EXISTING BUILDING:**

3.6.1. Make alterations to existing service piping at times that will least interfere with normal operation of the facility.

3.6.2. Cut required openings through existing masonry and reinforced concrete using diamond core drills. Use of pneumatic hammer type drills, impact type electric drills, and hand or manual hammer type drills, will be permitted only with approval of the Client. Locate openings that will least effect structural slabs, columns, ribs or beams. Refer to the Consultant for determination of proper design for openings through structural sections and opening layouts approval, prior to cutting or drilling into structure. After Consultant's approval, carefully cut opening through construction no larger than absolutely necessary for the required installation.

3.6.3. Switchgear/Electrical Equipment Drip Protection: Every effort shall be made to eliminate the installation of pipe above electrical and telephone switchgear. If this is not possible, encase pipe in a second pipe with a minimum of joints. Installation of piping, ductwork, leak protection apparatus or other installations foreign to the electrical installation shall be located in the space equal to the width and depth of the equipment and extending from to a height of 1.8 m (6 ft.) above the equipment to ceiling structure, whichever is lower (NFPA 70).

3.6.4. Inaccessible Equipment:

3.6.4.1. Where the Client determines that the Contractor has installed equipment not conveniently accessible for operation and maintenance, equipment shall be removed and reinstalled or remedial action performed as directed at no additional cost to the Client.

3.6.4.2. The term "conveniently accessible" is defined as capable of being reached without climbing or crawling under or over obstacles such as motors, fans, pumps, belt guards, transformers, high voltage lines, piping, and ductwork.

3.7. TEMPORARY PIPING AND EQUIPMENT

3.7.1. Continuity of operation of existing facilities will generally require temporary installation or relocation of equipment and piping.

3.7.2. The Contractor shall provide all required facilities in accordance with the requirements of phased construction and maintenance of service. All piping and equipment shall be properly supported, sloped to drain, operate without excessive stress, and shall be insulated where injury can occur to personnel by contact with operating facilities.

3.7.3. Temporary facilities and piping shall be completely removed and any openings in structures sealed. Provide necessary blind flanges and caps to seal open piping remaining in service.

3.8. **RIGGING**

3.8.1. Design is based on application of available equipment. Openings in building structures are planned to accommodate design scheme.

3.8.2. Alternative methods of equipment delivery may be offered by Contractor and will be considered by Client under specified restrictions of phasing and maintenance of service as well as structural integrity of the building.

3.8.3. Close all openings in the building when not required for rigging operations to maintain proper environment in the facility for Client operation and maintenance of service.

3.8.4. Contractor shall provide all facilities required to deliver specified equipment and place on foundations. Attachments to structures for rigging purposes and support of equipment on structures shall be Contractor's full responsibility. Upon request, the Client will check structure adequacy and advise Contractor of recommended restrictions.

3.8.5. Contractor shall check all clearances, weight limitations and shall offer a rigging plan designed by a Registered Professional Engineer. All modifications to structures, including reinforcement thereof, shall be at Contractor's cost, time and responsibility.

3.8.6. Rigging plan and methods shall be referred to Consultant for evaluation prior to actual Work.

3.8.7. Restore building to original condition upon completion of rigging Work.

3.9. **PIPE AND EQUIPMENT SUPPORTS**

3.9.1. Where hanger spacing does not correspond with joist or rib spacing, use structural steel channels secured directly to joist and rib structure that will correspond to the required hanger spacing, and then suspend the equipment and piping from the channels. Drill or burn holes in structural steel only with the prior approval of the Consultant.

3.9.2. Use of chain, wire or strap hangers; wood for blocking, stays and bracing; or, hangers suspended from piping above will not be permitted. Replace or thoroughly clean rusty Products and paint with zinc primer.

3.9.3. Use hanger rods that are straight and vertical. Turnbuckles for vertical adjustments may be omitted where limited space prevents use. Provide a minimum of 15 mm (1/2 inch) clearance between pipe or piping covering and adjacent Work.

3.9.4. HVAC Horizontal Pipe Support Spacing: Refer to MSS SP 69. Provide additional supports at valves, strainers, in line pumps and other heavy components. Provide a support within one foot of each elbow.

3.9.5. HVAC Vertical Pipe Supports:

3.9.5.1. Up to 150 mm (6 inch pipe), 9 m (30 feet) long, bolt riser clamps to the pipe below couplings, or welded to the pipe and rests supports securely on the building structure.

3.9.5.2. Vertical pipe larger than the foregoing, support on base elbows or tees, or substantial pipe legs extending to the building structure.

3.9.6. Overhead Supports:

3.9.6.1. The basic structural system of the building is designed to sustain the loads imposed by equipment and piping to be supported overhead.

3.9.6.2. Provide steel structural members, in addition to those shown, of adequate capability to support the imposed loads, located in accordance with the final approved layout of equipment and piping.

3.9.7. Tubing and capillary systems shall be supported in channel troughs.

3.9.8. Floor Supports:

3.9.8.1. Provide concrete bases, concrete anchor blocks and pedestals, and structural steel systems for support of equipment and piping. Anchor and dowel concrete bases and structural systems to resist forces under operating and seismic conditions (if applicable) without excessive displacement or structural failure.

3.9.8.2. Do not locate or install bases and supports until equipment mounted thereon has been approved. Size bases to match equipment mounted thereon plus 50 mm (2 inch) excess on all edges. Boiler foundations shall have horizontal dimensions that exceed boiler base frame dimensions by at least 150 mm (6 inches) on all sides. Refer to structural drawings. Bases shall be neatly finished and smoothed, shall have chamfered edges at the top, and shall be suitable for painting.

3.9.9. All equipment shall be shimmed, leveled, firmly anchored, and grouted with epoxy grout. Anchor bolts shall be placed in sleeves, anchored to the bases. Fill the annular space between sleeves and bolts with a granular material to permit alignment and realignment.

3.10. **CLEANING AND PAINTING**

3.10.1. Prior to final inspection and acceptance of the plant and facilities for beneficial use by the Client, the plant facilities, equipment and systems shall be thoroughly cleaned and painted.

3.10.2. In addition, the following special conditions apply:

3.10.2.1. Cleaning shall be thorough. Use solvents, cleaning materials and methods recommended by the manufacturers for the specific tasks. Remove all rust prior to painting and from surfaces to remain unpainted. Repair scratches, scuffs, and abrasions prior to applying prime and finish coats.

3.10.3. Material And Equipment Not To Be Painted Includes:

3.10.3.1. Motors, controllers, control switches, and safety switches.
3.10.3.2. Control and interlock devices.
3.10.3.3. Regulators.
3.10.3.4. Pressure reducing valves.
3.10.3.5. Control valves and thermostatic elements.
3.10.3.6. Lubrication devices and grease fittings.
3.10.3.7. Copper, brass, aluminum, stainless steel and bronze surfaces.
3.10.3.8. Valve stems and rotating shafts.
3.10.3.9. Pressure gauges and thermometers.
3.10.3.10. Glass.
3.10.3.11. Name plates.

3.10.4. Control and instrument panels shall be cleaned, damaged surfaces repaired, and shall be touched-up with matching paint obtained from panel manufacturer.

3.10.5. Pumps, motors, steel and cast iron bases, and coupling guards shall be cleaned, and shall be touched-up with the same color as utilized by the pump manufacturer

3.10.6. Temporary Facilities: Apply paint to surfaces that do not have existing finish coats.

3.10.7. Final result shall be smooth, even-colored, even-textured factory finish on all items. Completely repaint the entire piece of equipment if necessary to achieve this.

3.11. **IDENTIFICATION SIGNS**

3.11.1. Refer to Section 23 05 53

3.12. **MOTOR AND DRIVE ALIGNMENT**

3.12.1. Belt Drive: Set driving and driven shafts parallel and align so that the corresponding grooves are in the same plane.

3.12.2. Direct connect Drive: Securely mount motor in accurate alignment so that shafts are free from both angular and parallel misalignment when both motor and driven machine are operating at normal temperatures.

3.13. **LUBRICATION**

3.13.1. Lubricate all devices requiring lubrication prior to initial operation. Field-check all devices for proper lubrication.

3.13.2. Equip all devices with required lubrication fittings or devices. Provide a minimum of one liter (one quart) of oil and 0.5 kg (one pound) of grease of manufacturer's recommended grade and type for each different application; also provide 12 grease sticks for lubricated plug valves. Deliver all materials to Consultant in unopened containers that are properly identified as to application.

3.13.3. Provide a separate grease gun with attachments for applicable fittings for each type of grease applied.

3.13.4. All lubrication points shall be accessible without disassembling equipment, except to remove access plates.

3.14. **CONCRETE**

3.14.1. All concrete Work required to complete this project, whether shown on the drawings or not, shall be the Contractor’s responsibility.

3.14.2. Refer to this specification section for requirements for housekeeping pad.

3.15. **METALS**

3.15.1. All steel construction required for the completion of this project, whether shown on the drawings or not, shall be the Contractor’s responsibility.

3.16. **CUTTING, PATCHING, ROOFING AND X-RAY**

3.16.1. All cutting, patching, roofing and X-Rays required for the completion of this project whether shown on the drawings or not, shall be the Contractor's responsibility. The cutting and patching Work shall be performed in accordance with the following:

3.16.1.1. All cutting and patching shall be done by the trades specializing in the materials to be cut.

3.16.1.2. All flashing and equipment supports on the roof shall be done in strict accordance with the Client standards by Client-approved roofing Contractors only.

3.16.1.3. Should any cutting, roofing and/or repairing of finished surfaces be required, the Sub-trade Contractor for the Contractor shall employ the particular trades engaged on the site for this type of Work.

3.16.1.4. None of the roofing Work shall affect any current roof warranty. Coordinate with the Client representative the status of the roof, and if under warranty, coordinate all the Work with the warranty holder.

3.16.1.5. Supporting members of any floor, wall or the building structure shall be cut only in such a location and manner as approved by the Consultant.

3.16.1.6. Where slabs in the portions of the building which are existing must be saw-cut or core drilled, all locations shall be x-rayed prior to saw-cutting or core-drilling. All x-raying shall be done by personnel qualified in the use of the type of equipment required to x-ray the saw-cuts shall be permitted to perform this Work on the site. No allowance will be made later for expenses incurred through the failure of performing these x-rays.

3.17. **OPERATING AND MAINTENANCE MANUALS**

3.17.1. Refer to Section 01 23 33

3.18. **CLOSE-OUT DOCUMENTATION**

3.18.1. 10 (ten) days prior to substantial performance of Work obtain documentation and/or prepare certification of the following items and submit them to the Client representative:

3.18.1.1. All inspection certificates.

3.18.1.2. Guarantee certificates as called for under "Warranty".

3.18.1.3. Record drawings.

3.18.1.4. Operating and Maintenance Manuals.

3.18.1.5. Test certifications as called for under "Testing".

3.18.1.6. Provide a signed statement to the effect that all tests for mechanical systems and equipment have been completely carried out in the Trade Sections of these Specifications and to the manufacturer's recommendations, and in accordance with the requirements of all authorities having jurisdiction.

3.19. **COMMISSIONING**

3.19.1. Where applicable and the commissioning process is part of the project, provide commissioning documentation and all the manpower required for all inspection, start up, and Contractor testing required above and required by the Checklists provided by the Commissioning Agent.

3.19.2. Coordinate with the Commissioning Agent if the start up and operation of the installed equipment is part of larger systems which require additional testing and verification.

3.20. **STARTUP AND TEMPORARY OPERATION**

3.20.1. Startup equipment as described in equipment specifications. Verify that vibration is within specified tolerance prior to extended operation.

3.21. **OPERATING AND PERFORMANCE TESTS**

3.21.1. Prior to the final inspection, perform required tests as specified and submit the test reports and records to the Consultant. The timing of the tests shall be arranged to suit the convenience of the Consultant, and the manner and duration shall be as the Consultant deems necessary. Record the daily start and stop times, operating hours and functions performed. Ensure that the performance tests are witnessed by the Consultant.

3.21.2. Should evidence of malfunction in any tested system, or piece of equipment or component part thereof, occur during or as a result of tests, make proper corrections, repairs or replacements, and repeat tests at no additional cost to the Client.

3.21.3. At the successful completion of Performance Tests and all testing and balancing, make the systems ready for final inspection and subsequent acceptance of the Client. Replace and clean filters, flush out lines and equipment, remove and clean strainers,

fill liquid systems and purge air. Provide water treatment to pipes and report in accordance to current by-laws. Disinfect all domestic water as required by current by-laws and Authorities Having Jurisdiction.

3.21.4. When completion of certain Work or system occurs at a time when final control settings and adjustments cannot be properly made to make performance tests, then make performance tests for heating systems and for cooling systems respectively during first actual seasonal use of respective systems following completion of Work.

3.22. **INSTRUCTIONS TO CLIENT PERSONNEL**

3.22.1. Provide in accordance with Section 23 08 11

Table of Contents

PART 1 - GENERAL

1.1. RELATED DOCUMENTS

1.1.1. Drawings and general provisions of the Contract apply to this Section.

1.2. SUMMARY

1.2.1. Section Includes:

1.2.1.1. Equipment labels.
1.2.1.2. Warning signs and labels.
1.2.1.3. Pipe labels.
1.2.1.4. Valve tags.
1.2.1.5. Duct labels.

1.3. SUBMITTAL

1.3.1. Product Data: For each type of product indicated.

PART 2 - PRODUCTS

2.1. STANDARDS OF ACCEPTANCE

2.1.1. Brady, Kolbi, or Panduit.

2.2. MANUFACTURER'S EQUIPMENT NAMEPLATES

2.2.1. Metal or plastic laminate nameplate mechanically fastened to each piece of equipment by manufacturer.

2.2.2. Do not paint or insulate over manufacturer’s nameplates

2.2.3. Lettering and numbers to be raised or recessed.

2.2.4. Information to include, as appropriate:

2.2.4.1. Equipment: Manufacturer's name, model, size, serial number, capacity.
2.2.4.2. Motor: voltage, Hz, phase, power factor, duty, frame size.

2.3. **EQUIPMENT LABELS**

2.3.1. Metal Labels for Equipment:

2.3.1.1. Material and Thickness: Brass, 0.032-inch minimum thickness, and having pre-drilled or stamped holes for attachment hardware.

2.3.1.2. Minimum Label Size: Length and width vary for required label content, but not less than 2-1/2 by 3/4 inch.

2.3.1.3. Minimum Letter Size: 1/4 inch for name of units if viewing distance is less than 24 inches, 1/2 inch for viewing distances up to 72 inches, and proportionately larger lettering for greater viewing distances. Include secondary lettering two-thirds to three-fourths the size of principal lettering.

2.3.2. Fasteners: Stainless-steel rivets or self-tapping screws.

2.3.3. Adhesive: Contact-type permanent adhesive, compatible with label and with substrate.

2.3.4. Plastic Labels for Equipment:

2.3.4.1. Material and Thickness: Multilayer, multicolor, plastic labels for mechanical engraving, 1/8 inch thick, and having predrilled holes for attachment hardware.

2.3.4.2. Letter Color: White.

2.3.4.3. Background Color: Black.

2.3.4.4. Maximum Temperature: Able to withstand temperatures up to 160 deg F.

2.3.4.5. Minimum Label Size: Length and width vary for required label content, but not less than 2-1/2 by 3/4 inch.

2.3.4.6. Minimum Letter Size: 1/4 inch for name of units if viewing distance is less than 24 inches, 1/2 inch for viewing distances up to 72 inches, and proportionately larger lettering for greater viewing distances. Include secondary lettering two-thirds to three-fourths the size of principal lettering.

2.3.5. Fasteners: Stainless-steel rivets or self-tapping screws.

2.3.6. Adhesive: Contact-type permanent adhesive, compatible with label and with substrate.

2.3.7. Label Content: Include equipment's Drawing designation or unique equipment number, Drawing numbers where equipment is indicated (plans, details, and schedules), plus the Specification Section number and title where equipment is specified.

2.3.8. Label is to also indicate area and type of service being provided.

2.3.8.1. For Example AHU - 3 Services floors 1-4 etc.
2.3.8.2. P3 HHW Pump Services building perimeter

2.3.9. Equipment Label Schedule: For each item of equipment to be labeled, on 8-1/2-by-11-inch bond paper. Tabulate equipment identification number and identify Drawing numbers where equipment is indicated (plans, details, and schedules), plus the Specification Section number and title where equipment is specified. Equipment schedule shall be included in operation and maintenance data.

2.4. **WARNING SIGNS AND LABELS**

2.4.1. Material and Thickness: Multilayer, multicolor, plastic labels for mechanical engraving, 1/8 inch thick, and having predrilled holes for attachment hardware.

2.4.2. Letter Color: White.

2.4.3. Background Color: Red.

2.4.4. Maximum Temperature: Able to withstand temperatures up to 160 deg F.

2.4.5. Minimum Label Size: Length and width vary for required label content, but not less than 2-1/2 by 3/4 inch.

2.4.6. Minimum Letter Size: 1/4 inch for name of units if viewing distance is less than 24 inches, 1/2 inch for viewing distances up to 72 inches, and proportionately larger lettering for greater viewing distances. Include secondary lettering two-thirds to three-fourths the size of principal lettering.

2.4.7. Fasteners: Stainless-steel rivets or self-tapping screws.

2.4.8. Adhesive: Contact-type permanent adhesive, compatible with label and with substrate.

2.4.9. Label Content: Include caution and warning information, plus emergency notification instructions.

2.5. **PIPE LABELS**

2.5.1. General Requirements for Manufactured Pipe Labels:

2.5.1.1. Preprinted, color-coded, with lettering indicating service, showing flow direction, and area served (i.e. “domestic cold water”).

2.5.1.2. Self-Adhesive Pipe Labels: Printed plastic with contact-type, permanent-adhesive backing.

2.5.1.3. Pipe Label Contents: Include identification of piping service using same designations or abbreviations as used on Drawings, pipe size, and an arrow indicating flow direction.

2.5.1.4. Flow-Direction Arrows: Integral with piping system service lettering to accommodate both directions, or as separate unit on each pipe label to indicate flow direction, and visible all around pipe.

2.5.1.5. Lettering Size: At least 1-1/2 inches high.

2.5.2. All piping, except that piping which is within inaccessible chases, shall be identified.

2.5.3. Each marker background shall be appropriately color coded with a clearly printed legend to identify the contents of the pipe in conformance with the “Scheme for the Identification of Piping Systems” (ASME A13.1-1981).

2.5.4. Setmark snap-around markers shall be used for overall diameters up to 6” and strap around markers shall be used above 6” overall diameters.

2.5.5. Markers shall be located:

2.5.5.1. Adjacent to each valve
2.5.5.2. At each branch
2.5.5.3. At each cap for future
2.5.5.4. At each riser takeoff,
2.5.5.5. At each pipe passage through wall (each side)
2.5.5.6. At each pipe passage at 20’ – 0” intervals maximum.
2.5.5.7. At each piece of equipment.
2.5.5.8. At all access doors.
2.5.5.9. A minimum of one (1) marker shall be provided at each room.

2.5.6. HVAC tags shall be round 2” diameter, similar to Seton 15426.

2.5.7. Lettering shall be ¼” high for type service and ½” for valve number. Tag shall indicate service and valve number.

2.5.8. Tag shall be attached to valves with chain similar to Seton No 16 stainless steel jack chain.

2.6. **VALVE TAGS**

2.6.1. N/A

2.7. **DUCT LABELS**

2.7.1. Material and Thickness: Multilayer, multicolor, plastic labels for mechanical engraving, 1/8 inch thick, and having predrilled holes for attachment hardware.

2.7.1.1. Letter Color: White.
2.7.1.2. Background Color: Red.
2.7.1.3. Maximum Temperature: Able to withstand temperatures up to 160 deg F.
2.7.1.4. Minimum Label Size: Length and width vary for required label content, but not less than 2-1/2 by 3/4 inch.
2.7.1.5. Minimum Letter Size: 1/4 inch for name of units if viewing distance is less than 24 inches, 1/2 inch for viewing distances up to 72 inches, and proportionately larger lettering for greater viewing distances. Include secondary lettering two-thirds to three-fourths the size of principal lettering.

2.7.2. Fasteners: Stainless-steel rivets or self-tapping screws.

2.7.3. Adhesive: Contact-type permanent adhesive, compatible with label and with substrate.

2.7.4. Duct Label Contents: Include identification of duct service using same designations or abbreviations as used on Drawings, duct size, and an arrow indicating flow direction.

Flow-Direction Arrows: Integral with duct system service lettering to accommodate both directions, or as separate unit on each duct label to indicate flow direction.

2.7.5. Lettering Size: At least 1-1/2 inches high.

2.8. **OTHER SPECIALIZED LABELING AND REQUIREMENTS**

2.8.1. Fire damper access panels shall be permanently identified on the exterior by labels not less than 2" in height reading "FIRE DAMPER".

2.8.2. Smoke damper access panels shall be permanently identified on the exterior by labels not less than 2" in height reading "SMOKE DAMPER".

2.8.3. Combination fire/smoke damper access panels shall be permanently identified on the exterior by labels not less than 2" in height reading "RESETTABLE FIRE/SMOKE DAMPER". Mark the other access panels "FIRE/SMOKE DAMPER."

2.8.4. Items listed in items 1-3 above, will also be listed on a full size, laminated print and left in the main mechanical room as indicated above.

2.8.5. Duct static pressure sensors shall be permanently identified on the exterior by labels not less than 2" in height reading "STATIC PRESSURE SENSOR".

2.8.6. Abbreviations: No abbreviations to be used.

2.9. **STENCILING**

2.9.1. Not allowed.

PART 3 - EXECUTION

3.1. **PREPARATION**

3.1.1. Clean piping and equipment surfaces of substances that could impair bond of identification devices, including dirt, oil, grease, release agents, and incompatible primers, paints, and encapsulants.

3.2. **EQUIPMENT LABEL INSTALLATION**

3.2.1. Install or permanently fasten labels on each major item of mechanical equipment.

3.2.2. Locate equipment labels where accessible and visible.

3.3. **DUCT LABEL INSTALLATION**

3.3.1. Install self-adhesive duct labels with permanent adhesive on air ducts in the following color codes:

3.3.1.1. Blue: For cold-air supply ducts.
3.3.1.2. Yellow: For hot-air supply ducts.
3.3.1.3. Green: For exhaust-, outside-, relief-, return-, and mixed-air ducts.
3.3.1.4. ASME A13.1 Colors and Designs: For hazardous material exhaust.

3.3.2. Locate labels at maximum intervals of 10 feet, at every change in direction, and within 3' of wall and floor penetrations on both sides of same.

TABLE OF CONTENTS

PART 1 - GENERAL

1.1. **DESCRIPTION**

1.1.1. Field applied insulation for thermal efficiency and condensation control for HVAC ductwork and equipment.

1.1.2. Re-insulation of HVAC piping, ductwork and equipment after asbestos abatement.

1.1.3. Definitions

1.1.3.1. ASJ: All service jacket, white finish facing or jacket.

1.1.3.2. Air conditioned space: Space having air temperature and/or humidity controlled by mechanical equipment.

1.1.3.3. Cold: Equipment or piping handling media at design temperature of 16 degrees C (60 degrees F) or below.

1.1.3.4. Concealed: Piping above ceilings and in chases, interstitial space, and pipe chases.

1.1.3.5. Exposed: Piping and equipment exposed to view in finished areas including mechanical equipment rooms or exposed to outdoor weather. Shafts, chases, interstitial spaces, unfinished attics, crawl spaces and pipe basements are not considered finished areas.

1.1.3.6. Hot: Hot water equipment or piping handling media above 41 degrees C (105 degrees F).

1.1.3.7. Thermal conductance: Heat flow rate through materials.

1.1.3.8. Flat surface: Watts per square meter (BTU per hour per square foot).

1.1.3.9. Pipe or Cylinder: Watts per square meter (BTU per hour per linear foot).

1.1.3.10. Thermal Conductivity (k): Watt per meter, per degree C (BTU per inch thickness, per hour, per square foot, per degree F temperature difference).

1.1.3.11. Vapor Retarder (Vapor Barrier): A material which retards the transmission (migration) of water vapor. Performance of the vapor retarder is rated in terms of permeance (perms). or the purpose of this specification, vapor retarders shall have a maximum published permeance of 0.1 perms and vapor barriers shall have a maximum published permeance of 0.001 perms.

1.2. **RELATED WORK**

1.2.1. Section 23 05 11, COMMON WORK RESULTS FOR HVAC: General mechanical requirements and items, which are common to more than one section of Division 22.

1.3. **QUALITY ASSURANCE**

1.3.1. All materials shall be compatible and suitable for service temperature, and shall not contribute to corrosion or otherwise attack surface to which applied in either the wet or dry state.

1.3.2. Every package or standard container of insulation or accessories delivered to the job site for use must have a manufacturer's stamp or label giving the name of the manufacturer and description of the material

1.4. **APPLICABLE PUBLICATIONS**

1.4.1.1. Comply with OBC, CAN/ULC-S102, NFPA 255-2006 and ASTM E84 requirements pertaining to flame and smoke development. (25/50)

1.4.1.2. Comply with the requirements of NFPA 90 A/B

1.4.1.3. ANSI/ASHRAE/IESNA 90.1-2015, SI; Energy Standard for Buildings Except Low-Rise Residential Buildings.

1.4.1.4. ASTM International Inc.

1.4.1.4.1. ASTM A167 Specification for Stainless and Heat Resisting Chromium Nickel Steel Plate, Sheet and Strip

1.4.1.4.2. ASTM B209M-2014, Standard Specification for Aluminum and Aluminum-Alloy Sheet and Plate (Metric).

1.4.1.4.3. ASTM C335-2010, Standard Test Method for Steady State Heat Transfer Properties of Pipe Insulation.

1.4.1.4.4. ASTM C411-2011, Standard Test Method for Hot-Surface Performance of High-Temperature Thermal Insulation.

1.4.1.4.5. ASTM C449/C449M-00, Standard Specification for Mineral Fiber-Hydraulic-Setting Thermal Insulating and Finishing Cement.

1.4.1.4.6. ASTM C547-2015, Standard Specification for Mineral Fiber Pipe Insulation.

1.4.1.4.7. ASTM C553-2013, Standard Specification for Mineral Fiber Blanket Thermal Insulation for Commercial and Industrial Applications.

1.4.1.4.8. ASTM C612 2014, Standard Specification for Mineral Fiber Block and Board Thermal Insulation.

1.4.1.4.9. ASTM C795-08, Standard Specification for Thermal Insulation for Use in Contact with Austenitic Stainless Steel.

1.4.1.4.10. ASTM C921-2010, Standard Practice for Determining the Properties of Jacketing Materials for Thermal Insulation.

1.4.1.5. Canadian General Standards Board (CGSB)

1.4.1.5.1. CGSB 51-GP-52Ma-89, Vapour Barrier, Jacket and Facing Material for Pipe, Duct and Equipment Thermal Insulation.

1.4.1.5.2. CAN/CGSB 51.2M Type 2, Thermal Insulation, Polystyrene, Boards and Pipe Coverings

1.4.1.5.3. CAN/CGSB 51.12 Cement, Thermal Insulating and Finishing CAN/CGSB 51.40 Thermal Insulation, Flexible, Elastomeric, Unicellular, Sheet and Pipe Covering

1.4.1.5.4. CAN/ULC S102 Standard Method of Test for Surface Burning Characteristics of Building Materials and Assemblies

1.4.1.5.5. CGSB 51 GP 9M Thermal Insulation, Mineral Fibre, Sleeving for Piping and Round Ducting

1.4.1.5.6. CGSB 51 11M Thermal insulation, Mineral Fibre, Blanket for Piping, Ducting, Machinery and Boilers

1.4.1.5.7. CGSB 51 GP 53M Jacketing, Polyvinyl Chloride Sheet for Insulating Pipes, Vessels and Round Ducts

1.4.1.6. Green Seal Environmental Standards (GSES)

1.4.1.6.1. Standard GS-36-00, Commercial Adhesives.

1.4.1.7. Thermal Insulation Association of Canada (TIAC): National Insulation Standards (2005).

1.4.1.8. Underwriters Laboratories of Canada (ULC)

1.4.1.8.1. CAN/ULC-S102-10, Method of Test for Surface Burning Characteristics of Building Materials and Assemblies.

1.4.1.8.2. CAN/ULC-S701-11, Standard for Thermal Insulation, Polystyrene, Boards and Pipe Covering.

1.5. **DEFINITIONS**

1.5.1. Specified k factors are at 24 degrees C (75 degrees F) mean temperature unless stated otherwise. For pipe, use insulation manufacturer's published heat flow tables. For domestic hot water supply and return, run out insulation and condensation control insulation, no thickness adjustment need be made.

1.6. **SUBMITTALS**

1.6.1. Shop Drawings:

1.6.1.1. All information, clearly presented, shall be included to determine compliance with drawings and specifications and ASTM, federal and military specifications.

1.6.1.2. Insulation materials: Specify each type used and state surface burning characteristics.

1.6.1.3. Insulation facings and jackets: Each type used.

1.6.1.4. Insulation accessory materials: Each type used.

1.6.1.5. Manufacturer's installation and fitting fabrication instructions for flexible unicellular insulation.

1.6.1.6. Make reference to applicable specification paragraph numbers for coordination.

1.7. **STORAGE AND HANDLING OF MATERIAL**

1.7.1. Store materials in clean and dry environment, pipe covering jackets shall be clean and unmarred. Place adhesives in original containers. Maintain ambient temperatures and conditions as required by printed instructions of manufacturers of adhesives, mastics and finishing cements.

1.8. **APPLICABLE PUBLICATIONS**

1.8.1. The publications listed below form a part of this specification to the extent referenced. The publications are referenced in the text by basic designation only.

1.8.2. National Fire Protection Association (NFPA):

1.8.2.1. 101-09 Life Safety Code

1.8.2.2. 251-06 Standard methods of Tests of Fire Endurance of Building Construction Materials

1.8.2.3. 255-06 Standard Method of tests of Surface Burning Characteristics of Building Materials

1.8.3. Underwriters Laboratories, Inc (UL):

1.8.3.1. 723 UL Standard for Safety Test for Surface Burning Characteristics of Building Materials with Revision of 08/03

1.8.4. Manufacturer's Standardization Society of the Valve and Fitting Industry (MSS):

1.8.4.1. SP58-2002 Pipe Hangers and Supports Materials, Design, and Manufacture

1.9. **STANDARDS OF ACCEPTANCE**

1.9.1. Owens/Corning, Knauf, Johns Mansville, Armaflex

PART 2 - PRODUCTS

2.1. **HVAC PIPING INSULATION**

2.1.1. For refrigerant piping insulation, refer to section 23 23 00

2.2. **FITTINGS, FLANGE AND VALVE INSULATION – HOT AND COLD PIPING:**

2.2.1. N/A

2.3. **EQUIPMENT IN COLD INSTALLATIONS**

2.3.1. N/A

2.4. **DUCTWORK INSULATION**

2.4.1. Application

2.4.1.1. All exposed ductwork inside the mechanical rooms conveying air at temperatures above $30^{O}C$ or below $18^{O}C$

2.4.1.2. All exhaust air ductwork 3m upstream of the point of discharge to the outdoors

2.4.1.3. All fresh air supply ductwork

2.4.1.4. All fresh air intake ductwork and plenums

2.4.1.5. All ductwork mounted outdoors

2.4.1.6. All combustion air ductwork

2.4.2. Round Ductwork or Rectangular Ductwork Concealed – any side less than 750 mm (30”)

2.4.2.1. For rectangular ductwork: in concealed locations such as ceiling spaces, building shafts, and other locations where not visible

2.4.2.2. For round ductwork: all locations

2.4.2.3. Insulate ductwork with 40 mm (1½") thick, blanket-type, fiberglass insulation with factory-applied vapor barrier, and 50 mm (2") stapling and taping flange along one edge. Insulation: ASTM C553, density of 1 lbs/cu.ft. (16 kg/m3) conductivity of 0.32 BTU-in/hr-ft2-F (0.046 W/m-K).

2.4.2.4. Vapor barrier: aluminum foil, permeance of 0.02, and puncture resistance of 50 units. Composite flame spread/ smoke density of 25/50.

2.4.2.5. Apply insulation from outlet of air handling equipment to air distribution equipment

2.4.2.6. Outdoor mounted round ductwork: increase insulation thickness to 50 mm (2”)

2.4.2.7. Outdoor Jacket: Aluminum JacketASTM B209, 3003 alloy, H-14 temper, 0.6 mm (0.023 inch) minimum thickness with locking longitudinal joints. Jackets for elbows, tees and other fittings shall be factory-fabricated to match shape of fitting and of 0.6 mm (0.024) inch minimum thickness aluminum. Fittings shall be of same construction as straight run jackets but need not be of the same alloy. Factory-fabricated stainless steel bands shall be installed on all circumferential joints. Bands shall be 13 mm (0.5 inch) wide on 450 mm (18 inch) centers. System shall be weatherproof if utilized for outside service.

2.4.3. Rectangular Ductwork – in all mechanical rooms or where exposed, any side larger than 750 mm (30”)

2.4.3.1. Not applicable for outdoor installations

2.4.3.2. In mechanical equipment rooms and all other areas where visible without removing ceilings or opening access panels, insulate ductwork with 40 mm (1 ½” thick) rigid, fiberglass insulation board ASTM C612 Class 2, conductivity of 0.26, density of 3.0. with factory-applied vapor barrier, 0.05 mm (0.002”) foil-scrim facing. Vapor barrier: laminated white kraft paper, aluminum foil, glass fiber

reinforcement, permeance of 0.02, and puncture resistance of 50 units. Composite flame spread/ smoke density of 25/50.

2.4.3.3. Jacketing

2.4.3.3.1. Vapor Retarder, higher strength with low water permeance 0.02 or less perm rating, Beach puncture 50 units for insulation facing on exposed ductwork, casings and equipment, and for pipe insulation jackets. Facings and jackets shall be all service type (ASJ) or PVDC Vapor Retarder jacketing

2.4.3.3.2. ASJ jacket shall be white kraft bonded to 0.025 mm (1 mil) thick aluminum foil, fiberglass reinforced, with pressure sensitive adhesive closure. Comply with ASTM C1136. Beach puncture 50 units, Suitable for painting without sizing. Jackets shall have minimum 40 mm (1-1/2 inch) lap on longitudinal joints and minimum 75 mm (3 inch) butt strip on end joints. Butt strip material shall be same as the jacket. Lap and butt strips shall be self-sealing type with factory-applied pressure sensitive adhesive.

2.4.3.3.3. Standard of Acceptance: 3M Venture-Clad, Polyguard.

2.4.4. <u>Outdoor Rectangular Ductwork – any size</u>

2.4.4.1. Insulate ductwork with 50 mm (2” thick) rigid, fiberglass insulation board with factory-applied vapor barrier. Insulation: ASTM C612 Class 2, conductivity of 0.26 BTU-in/hr-ft2-F (0.037 W/m-K), density of 3 lbs/cu.ft. (48 kg/m3)

2.4.4.2. Vapor barrier: laminated white kraft paper, aluminum foil, glass fiber reinforcement, permeance of 0.02, and puncture resistance of 50 units. Composite flame spread/ smoke density of 25/50.

2.4.4.3. Jacketing

2.4.4.3.1. Aluminum JacketASTM B209, 3003 alloy, H-14 temper, 0.6 mm (0.023 inch) minimum thickness with locking longitudinal joints. Jackets for elbows, tees and other fittings shall be factory-fabricated to match shape of fitting and of 0.6 mm (0.024) inch minimum thickness aluminum. Fittings shall be of same construction as straight run jackets but need not be of the same alloy. Factory-fabricated stainless steel bands shall be installed on all circumferential joints. Bands shall be 13 mm (0.5 inch) wide on 450 mm (18 inch) centers. System shall be weatherproof if utilized for outside service.

2.4.5. Accessories

2.4.5.1. Closure Materials: Butt strips, bands, wires, staples, mastics, adhesives; pressure-sensitive tapes.
2.4.5.2. Support Materials: Hanger straps, hanger rods, saddles, support rings.
2.4.5.3. Contact adhesive: quick-setting, non-flammable fire resistive adhesive to adhere fibrous glass to ducts. Flame spread 15 smoke development 0.

2.4.6. Kitchen Grease Exhaust

2.4.6.1. N/A

PART 3 - EXECUTION

3.1. **GENERAL REQUIREMENTS**

3.1.1. Required pressure tests of piping and ductwork joints and connections shall be completed and the work approved by the Consultant for application of insulation. Surface shall be clean and dry with all foreign materials, such as dirt, oil, loose scale and rust removed.

3.1.2. Except for specific exceptions, insulate all specified equipment, and piping (pipe, fittings, valves, accessories). Insulate each pipe individually. Do not use scrap pieces of insulation where a full length section will fit.

3.1.3. Insulation materials shall be installed in a first class manner with smooth and even surfaces, with jackets and facings drawn tight and smoothly cemented down at all laps. Insulation shall be continuous through all sleeves and openings, except at fire dampers and duct heaters (NFPA 90A). Vapor retarders shall be continuous and uninterrupted throughout systems with operating temperature 16 degrees C (60 degrees F) and below. Lap and seal vapor barrier over ends and exposed edges of insulation. Anchors, supports and other metal projections through insulation on cold surfaces shall be insulated and vapor sealed for a minimum length of 150 mm (6 inches).

3.1.4. Install vapor stops at all insulation terminations on either side of valves, pumps and equipment and particularly in straight lengths of pipe insulation.

3.1.5. Construct insulation on parts of equipment such as chilled water pumps and heads of chillers, convertors and heat exchangers that must be opened periodically for maintenance or repair, so insulation can be removed and replaced without damage. Install insulation with bolted 1 mm thick (20 gage) galvanized steel or aluminum covers

as complete units, or in sections, with all necessary supports, and split to coincide with flange/split of the equipment.

3.1.6. Insulation on hot piping and equipment shall be terminated square at items not to be insulated, access openings and nameplates. Cover all exposed raw insulation with white sealer or jacket material.

3.1.7. Protect all insulations outside of buildings with aluminum jacket using lock joint or other approved system for a continuous weather tight system. Access doors and other items requiring maintenance or access shall be removable and sealable.

3.1.8. Elbows, flanges and other fittings shall be insulated with the same material as is used on the pipe straights.

3.1.9. Ductwork not to be insulated:

3.1.9.1. Indoor return ductwork
3.1.9.2. Exhaust air ductwork up to 3 m (10 ft) prior to existing the building

3.1.10. Firestop Pipe insulation:

3.1.10.1. Provide firestopping insulation at fire and smoke barriers through penetrations. Fire stopping insulation shall be UL listed.

3.1.10.2. Pipe penetrations requiring fire stop insulation including, but not limited to the following:

3.1.10.2.1. Pipe risers through floors
3.1.10.2.2. Pipe chase walls and floors
3.1.10.2.3. Smoke partitions
3.1.10.2.4. Fire partitions
3.1.10.2.5. Freeze protection of above grade outdoor piping (over heat tracing tape): 20 mm (0.75) thick insulation, for all pipe sizes 75 mm(3 inches) and smaller and 25 mm(1inch) thick insulation for larger pipes. Provide metal jackets for all pipes. Provide where indicated on the drawings

3.1.11. Provide vapor barrier jackets over insulation as follows:

3.1.11.1. All piping and ductwork exposed to outdoor weather.
3.1.11.2. All piping and ductwork conveying air/fluids colder than 20^{O}C.

3.1.11.3. All interior piping and ductwork conveying fluids exposed to outdoor air (i.e. in attics, ventilated (not air conditioned) spaces, etc.

3.1.12. Provide metal jackets over insulation as follows:

3.1.12.1. All HVAC piping and ductwork exposed to outdoor weather.

3.2. **INSULATION INSTALLATION**

3.2.1. Flexible Mineral Fiber Blanket - Ductwork:

3.2.1.1. Adhere insulation to metal with 75 mm (3 inch) wide strips of insulation bonding adhesive at 200 mm (8 inches) on center all around duct. Additionally secure insulation to bottom of ducts exceeding 600 mm (24 inches) in width with pins welded or adhered on 450 mm (18 inch) centers. Secure washers on pins. Butt insulation edges and seal joints with laps and butt strips. Staples may be used to assist in securing insulation. Seal all vapor retarder penetrations with mastic. Sagging duct insulation will not be acceptable. Install firestop duct insulation where required.

3.2.1.2. Blanket insulation shall be tightly sealed at all joints and seams. Insulation shall be cut longer than ductwork perimeter to allow maximum thickness on all areas and avoid excessive compression. All joints shall be over lapped at least 2" and stapled in place. The stapled seams shall be sealed with a minimum 3" wide pressure sensitive tape designed for use with the duct insulation. All breaks in the vapor barrier facing shall also be sealed with the tape. The underside of ductwork 18" or greater in width, and vertical surfaces 48" or greater shall have the insulation additionally secured with mechanical fasteners and speed clips spaced approximately 12" on center. The protruding ends of the fasteners shall be cut off flush after the speed clips are installed, and then sealed with the same tape as specified above.

3.2.1.3. Finished installation shall provide a continuous and effective vapor barrier.

3.2.1.4. Supply air ductwork to be insulated includes main and branch ducts from AHU discharge to room supply outlets, and the bodies of ceiling outlets to prevent condensation. Insulate sound attenuator units, coil casings and damper frames. To prevent condensation insulate trapeze type supports and angle iron hangers for flat oval ducts that are in direct contact with metal duct.

3.2.2. Rigid Board Mineral Fiber Insulation - Ductwork

3.2.2.1. Apply board on pins spaced not more than 300 mm (12 inches) on center each way, and not less than 75 mm (3 inches) from each edge of board. In addition to pins, apply insulation bonding adhesive to entire underside of horizontal metal surfaces. Butt insulation edges tightly and seal all joints with laps and butt strips. After applying speed clips cut pins off flush and apply vapor seal patches over clips.

3.2.2.2. Insulation shall be scored, beveled or mitered to provide tight joints and be secured to equipment with bands spaced 225 mm (9 inches) on center for irregular surfaces or with pins and clips on flat surfaces. Use corner beads to protect edges of insulation.

3.2.2.3. For hot equipment: Stretch 25 mm (1 inch) mesh wire, with edges wire laced together, over insulation and finish with insulating and finishing cement applied in one coat, 6 mm (1/4 inch) thick, trowel led to a smooth finish.

3.2.2.4. For cold equipment: Apply meshed glass fabric in a tack coat 1.5 to 1.7 square meter per liter (60 to 70 square feet per gallon) of vapor mastic and finish with mastic at 0.3 to 0.4 square meter per liter (12 to 15 square feet per gallon) over the entire fabric surface.

3.3. **INSULATION JOINTS**

3.3.1. All insulation joints should be sealed with pressure-sensitive joint sealing tape to match the insulation facing. Rub hard with a plastic sealing tool to effect a tight bond.

3.3.2. Recommended practice: 3" (76mm) wide tape on flat surfaces or where edges are ship-lapped and stapled. Use 5" (102mm) wide tape in lieu of ship-lapping.

3.3.3. All sheet metal joints must be sealed prior to insulating.

3.4. **INSULATION AT DUCT SUPPORTS**

3.4.1. Refer to and conform strictly to insulation and protection jacket manufacturers' instructions.

3.4.2. To properly insulate through a roof top duct support; lift duct off of support, insulate duct through the support, install protection jacket through the support and add an additional layer of protection jacket 6" wide on the bottom and both sides at the point of contact with the support system.

3.4.3. When it is not possible to lift a duct off the rooftop supports, it is necessary to incorporate the support system into the insulation system by encapsulating the supports with insulation. This same system must be used if duct supports are screwed onto the ductwork

3.5. **FIELD-APPLIED JACKET APPLICATION**

3.5.1. Apply PVC jacket on piping insulation where indicated, with 1 inch (25 mm) overlap at longitudinal seams and end joints. Seal with manufacturer's recommended adhesive.

3.5.2. Apply aluminum jacket where indicated (piping and ductwork) and on all piping/ductwork located outdoors, with 2-inch (50 mm) overlap at longitudinal seams and end joints. Overlap longitudinal seams arranged to shed water. Seal end joints with weatherproof sealant recommended by insulation manufacturer. Secure jacket with stainless-steel band 12 inches (300 mm) o.c. and at end joints. Provide vapor-barrier jackets. Aluminum jackets shall have seams located below the horizontal plane of the horizontal piping route. Insulate fittings, joints, and valves with insulation of like material and thickness as adjoining pipe, and cover with aluminum jackets.

3.6. **OUTDOOR DUCTWORK – RECTANGULAR**

3.6.1. All roof-top ductwork to must be designed and built with adequate slope (watershed) to prevent ponding water. Ponding water is defined as water that stays in place for greater than 24 hours.

3.7. **COMMISSIONING**

3.7.1. N/A

Table of Contents

PART 1 - GENERAL

1.1. REQUIREMENTS INCLUDED

1.1.1. Procedures for on-site demonstration and testing of equipment and systems, including temporary facilities.

1.2. INSTRUCTION OF CLIENT'S OPERATING PERSONNEL.

1.2.1. All demonstrations, instructions and testing must be completed prior to Client acceptance for beneficial use. All safety devices most pass 100 percent before the mechanical systems can be accepted for beneficial use.

1.3. DEFINITIONS

1.3.1. Start Up: Initial inspection, cleaning, lubrication, adjustment, and operation of equipment and systems by the Contractor with the assistance of the representatives of the equipment manufacturers.

1.3.2. Pre Tests: The final stage of the startup procedure. This occurs after all adjustments have been made except for minor fine-tuning that can be done during the pre test. Serves as verification that the systems are ready for the final test. Witnessing of pre test by the Consultant is not required.

1.3.3. Final Tests: Tests, witnessed by the Consultant or their representative, which demonstrate that all equipment and systems are in compliance with requirements.

1.4. QUALITY ASSURANCE

1.4.1. Experienced, trained technical service personnel who are representatives of the equipment manufacturers and system designers shall demonstrate, provide instructions, pre test and final test, as specified, the following equipment:

1.4.1.1. Air Handling Equipment
1.4.1.2. Heat Pumps and Compressors
1.4.1.3. Control systems.
1.4.1.4. Instrumentation.

1.4.2. Experienced technicians shall demonstrate and provide instructions on the following equipment:

1.4.2.1. Heat Pump Systems
1.4.2.2. Ventilation, air conditioning/cooling and heating systems
1.4.2.3. Control and safety valves

1.4.3. The person responsible for programming the BAS shall demonstrate and provide instructions on hardware, software and programming.

1.4.4. The Client will provide a list of personnel to receive instructions and will coordinate their attendance at agreed upon times.

1.4.5. All safety devices shall comply with the TSSA requirements.

1.5. **SUBMITTALS**

1.5.1. Names and qualifications of personnel performing demonstrations, instructions and tests.

1.5.2. Certification that pre testing is complete.

1.5.3. Preliminary schedule of all demonstrations, instructions and final tests two weeks prior to proposed dates.

1.5.4. Provide reports within three weeks after satisfactory completion of demonstrations, instructions, and tests. List date, type of Work, persons participating, amount of time, test results, calculations of test results, test data.

1.5.5. Completed System Readiness Checklists provided by the Commissioning Agent and completed by the Contractor, signed by a qualified technician and dated on the date of completion,

PART 2 - PRODUCTS (NOT USED)

PART 3 - EXECUTION

3.1. **PREPARATION FOR FINAL TESTS, DEMONSTRATIONS, AND INSTRUCTIONS**

3.1.1. Verify that equipment and systems are fully operational. Complete all start up and pre test activities for all equipment and systems. Complete all construction and finish Work.

3.1.2. Arrange for all test personnel for all equipment to be continuously present during one period of time so that all equipment and systems can be tested in their interrelated functions. For instance, the burner in a heating system shall be tested during the boiler testing, and instrumentation performance will be evaluated in conjunction with boiler testing.

3.1.3. Deliver maintenance and operating manuals four weeks prior to instruction period.

3.1.4. Furnish all special tools.

3.2. **FINAL TESTS**

3.2.1. Demonstrate proper operation of each equipment and system.

3.2.2. Provide tests on equipment as specified in the individual specification sections.

3.3. **STARTUP AND TESTING**

3.3.1. The Consultant may observe startup and Contractor testing of selected equipment. Coordinate the startup and contactor testing schedules with the Consultant. Provide a minimum of 7 days prior notice.

3.4. **DEMONSTRATIONS AND TRAINING**

3.4.1. Demonstrate operation and maintenance of equipment and systems to Client personnel no more than two weeks prior to scheduled Client operation of the plant.

3.4.2. Use operation and maintenance manuals as basis of instruction. Review contents of manuals with personnel in detail to explain all aspects of operation and maintenance.

3.4.3. Demonstrate start up, operation, control, adjustment, trouble shooting, servicing, maintenance, and shut down of each item of equipment. Allow Government personnel to practice operating the equipment under supervision of instructors.

3.4.4. Prepare and insert additional data in operations and maintenance manuals when need for additional data becomes apparent during instructions.

3.4.5. Submit training plans and instructor qualifications

3.5. **TIME ALLOCATED FOR DEMONSTRATIONS AND INSTRUCTIONS**

3.5.1. At least 4 total instructor hours to include all new building Services installed under this project.

3.5.2. At least 2 total instructor hours to include BAS and computer workstation and programs.

3.5.3. Do not exceed three trainees per session, one four hour session, per day, per trainee.

TABLE OF CONTENTS

PART 1 - GENERAL

1.1. DESCRIPTION

1.1.1. Refrigerating system: Combination of interconnected refrigerant containing parts constituting one closed refrigeration circuit in which a refrigerant is circulated for the purpose of extracting heat.

1.1.2. Low side means the parts of a refrigerating system subjected to evaporator pressure.

1.1.3. High side means the parts of a refrigerating system subjected to condenser pressure.

1.1.4. Brazed joint: A gas tight joint obtained by the joining of metal parts with alloys which melt at temperatures higher than 449 degrees C (840 degrees F) but less than the melting temperatures of the joined parts.

1.2. RELATED WORK

1.2.1. Section 01 23 33, SHOP DRAWINGS.
1.2.2. Section 23 05 11, COMMON WORK RESULTS FOR HVAC.

1.3. QUALITY ASSURANCE

1.3.1. Refer to specification Section 23 05 11, COMMON WORK RESULTS FOR HVAC.

1.3.2. Comply with ASHRAE Standard 15, Safety Code for Mechanical Refrigeration. The application of this Code is intended to assure the safe design, construction, installation, operation, and inspection of every refrigerating system employing a fluid which normally is vaporized and liquefied in its refrigerating cycle.

1.3.3. Comply with ASME B31.5: Refrigerant Piping and Heat Transfer Components.

1.3.4. Products shall comply with UL 207 "Refrigerant–Containing Components and Accessories, "Nonelectrical"; or UL 429 "Electrical Operated Valves."

1.4. SUBMITTALS

1.4.1. Submit in accordance with specification Section 01 23 33, SHOP DRAWINGS.

1.4.2. Shop Drawings:

1.4.2.1. Complete information for components noted, including valves and refrigerant piping accessories, clearly presented, shall be included to determine compliance with drawings and specifications for components noted below:

1.4.2.1.1. Tubing and fittings
1.4.2.1.2. Valves
1.4.2.1.3. Strainers
1.4.2.1.4. Moisture liquid indicators
1.4.2.1.5. Filter driers
1.4.2.1.6. Flexible metal hose
1.4.2.1.7. Liquid suction interchanges
1.4.2.1.8. Oil separators (when specified)
1.4.2.1.9. Gages
1.4.2.1.10. Pipe and equipment supports
1.4.2.1.11. Refrigerant and oil
1.4.2.1.12. Pipe/conduit roof penetration cover
1.4.2.1.13. Soldering and brazing materials

1.4.2.2. Submit layout of refrigerant piping and accessories, including flow capacities, valves locations, and oil traps slopes of horizontal runs, floor/wall penetrations, and equipment connection details.

1.4.2.3. Refrigerant piping shall be sized, selected, and designed either by the equipment manufacturer or in strict accordance with the manufacturer's published instructions. The schematic piping diagram shall show all accessories such as, stop valves, level indicators, liquid receivers, oil separator, gauges, thermostatic expansion valves, solenoid valves, moisture separators and driers to make a complete installation.

1.4.2.4. Design Manual: Furnish two copies of design manual of refrigerant valves and accessories.

1.5. **APPLICABLE PUBLICATIONS**

1.5.1. The publications listed below form a part of this specification to the extent referenced. The publications are referenced in the text by the basic designation only.

1.5.2. Air Conditioning, Heating, and Refrigeration Institute (ARI/AHRI):

1.5.2.1.	495-2002	Standard for Refrigerant Liquid Receivers
1.5.2.2.	730-2005	Flow Capacity Rating of Suction-Line Filters and Suction-Line Filter-Driers
1.5.2.3.	750-2007	Thermostatic Refrigerant Expansion Valves
1.5.2.4.	760 2007	Performance Rating of Solenoid Valves for Use with Volatile Refrigerants

1.5.3. American Society of Heating Refrigerating and Air Conditioning Engineers (ASHRAE):

1.5.3.1.	ANSI/ASHRAE 15 2007	Safety Standard for Refrigeration Systems (ANSI)
1.5.3.2.	ANSI/ASHRAE 17 2008	Method of Testing Capacity of Thermostatic Refrigerant Expansion Valves (ANSI)
1.5.3.3.	63.1-95 (RA 01)	Method of Testing Liquid Line Refrigerant Driers (ANSI)

1.5.4. American National Standards Institute (ANSI):

1.5.4.1.	ASME (ANSI)A13.1-2007	Scheme for Identification of Piping Systems
1.5.4.2.	Z535.1-2006	Safety Color Code

1.5.5. American Society of Mechanical Engineers (ASME):

1.5.5.1.	ANSI/ASME B16.22 2001 (R2005)	
1.5.5.2.	Wrought Copper and Copper Alloy Solder-Joint Pressure Fittings (ANSI)	
1.5.5.3.	ANSI/ASME B16.24 2006	Cast Copper Alloy Pipe Flanges and Flanged Fittings, Class 150, 300, 400, 600, 900, 1500 and 2500 (ANSI)
1.5.5.4.	ANSI/ASME B31.5-2006	Refrigeration Piping and Heat Transfer Components (ANSI)
1.5.5.5.	ANSI/ASME B40.100-2005	Pressure Gauges and Gauge Attachments
1.5.5.6.	ANSI/ASME B40.200-2008	Thermometers, Direct Reading and Remote Reading

1.5.6. American Society for Testing and Materials (ASTM)

1.5.6.1.	B88 03	Standard Specification for Seamless Copper Water Tube
1.5.6.2.	B88M-05	Standard Specification for Seamless Copper Water Tube
1.5.6.3.	B280 08	Standard Specification for Seamless Copper Tube for Air Conditioning and Refrigeration Field Service

1.5.7. Underwriters Laboratories (U.L.):

1.5.7.1. U.L.207-2009 Standard for Refrigerant-Containing Components and Accessories, Nonelectrical

1.5.7.2. U.L.429-99 (Rev.2006) Standard for Electrically Operated Valves

PART 2 - PRODUCTS

2.1. PIPING AND FITTINGS

2.1.1. Refrigerant Piping: For piping up to 100 mm (4 inch) use Copper refrigerant tube, ASTM B280, cleaned, dehydrated and sealed, marked ACR on hard temper straight lengths. Coils shall be tagged ASTM B280 by the manufacturer. For piping over 100 mm (4 inch) use A53 Black SML steel.

2.1.2. Fittings, Valves and Accessories:

2.1.2.1. Copper fittings: Wrought copper fittings, ASME B16.22.

2.1.2.2. Brazed Joints, refrigerant tubing: Cadmium free, AWS A5.8/A5.8M, 45 percent silver brazing alloy, Class BAg-5.

2.1.2.3. Solder Joints, water and drain: 95 5 tin antimony, ASTM B32 (95TA).

2.1.2.4. Refrigerant piping – Welded Joints.

2.1.2.5. Flanges and flanged fittings: ASME B16.24.

2.1.3. Flexible connectors

2.1.3.1. Install at all locations where refrigerant piping is connected to equipment containing moving or rotating parts (compressors, supply fans, condenser fans, etc)

2.2. **REFRIGERATION VALVES:**

2.2.1. Stop Valves:

2.2.1.1. Brass or bronze alloy, packless, or packed type with gas tight cap, frost proof, back seating.

2.2.2. Pressure Relief Valves:

2.2.2.1. Comply with ASME Boiler and Pressure Vessel Code; UL listed. Forged brass with nonferrous, corrosion resistant internal working parts of high strength, cast iron bodies conforming to ASTM A126, Grade B. Set valves in accordance with ASHRAE Standard 15.

2.2.3. Solenoid Valves:

2.2.3.1. UL-listed, 250 deg. F temperature rating, 400 psig working pressure; forged brass, with Teflon valve seat, two-way straight through pattern, and solder end connections. Provide manual operator to open valve. Furnish complete with NEMA 1 solenoid enclosure with ½ inch conduit adapter, holding coil, voltage to meet controls requirements.

2.2.3.2. Comply with ARI 760 and UL 429, UL-listed, two-position, direct acting or pilot-operated, moisture and vapor proof type of corrosion resisting materials, designed for intended service, and solder-end connections. Fitted with suitable NEMA 250 enclosure of type required by location and normally open or closed holding coil (as specified)

2.2.4. Thermostatic Expansion Valves:

2.2.4.1. Comply with ARI 750. Brass body with stainless-steel or non-corrosive non ferrous internal parts, diaphragm and spring-loaded (direct-operated) type with sensing bulb and distributor having side connection for hot-gas bypass and external equalizer. Size and operating characteristics as recommended by manufacturer of evaporator and factory set for superheat requirements. Solder-end connections. Testing and rating in accordance with ASHRAE Standard 17.

2.2.5. Check Valves:

2.2.5.1. Brass or bronze alloy with swing or lift type, with tight closing resilient seals for silent operation; designed for low pressure drop, and with solder-end

connections. Direction of flow shall be legibly and permanently indicated on the valve body.

2.2.6. Strainers:

2.2.6.1. Designed to permit removing screen without removing strainer from piping system, and provided with screens 80 to 100 mesh in liquid lines DN 25 (NPS 1) and smaller, 60 mesh in liquid lines larger than DN 25 (NPS 1), and 40 mesh in suction lines. Provide strainers in liquid line serving each thermostatic expansion valve, and in suction line serving each refrigerant compressor not equipped with integral strainer.

2.2.7. Refrigerant Moisture/Liquid Indicators:

2.2.7.1. Double ported type having heavy sight glasses sealed into forged bronze body and incorporating means of indicating refrigerant charge and moisture indication. Provide screwed brass seal caps.

2.2.8. Refrigerant Filter Dryers:

2.2.8.1. UL listed, angle or in line type, as shown on drawings. Conform to ARI Standard 730 and ASHRAE Standard 63.1. Heavy gage steel shell protected with corrosion-resistant paint; perforated baffle plates to prevent desiccant bypass. Size as recommended by manufacturer for service and capacity of system with connection not less than the line size in which installed. Filter driers with replaceable filters shall be furnished with one spare element of each type and size.

2.2.9. Flexible Metal Hose:

2.2.9.1. Seamless bronze corrugated hose, covered with bronze wire braid, with standard copper tube ends. Provide in suction and discharge piping of each compressor and connections to air handling equipment.

2.2.10. Oil Separators:

2.2.10.1. Provide for condensing units, as shown. All welded steel construction with capacity to eliminate a minimum of 95 percent of the oil from the hot gas flowing through it. Provide manufacturer's published ratings for minimum and maximum refrigeration tonnage corresponding to this oil separating efficiency. Separator shall be equipped with a float valve to prevent return of the hot gas

to crankcase, and shall have isolating stop valves so it can be opened and services without pumping out any other part of the system. ASME construction or UL listed.

2.2.11. Receivers:

2.2.11.1. Conform to AHRI 495, steel construction, equipped with tappings for liquid inlet and outlet valves, pressure relief valve and liquid level indicator.

2.2.12. Standards of Acceptance for Refrigerant Valves and Specialties:

2.2.12.1. Emerson Electric, Danfoss, Henry Industries

2.3. **GAGES**

2.3.1. Temperature Gages: Comply with ASME B40.200. Industrial duty type and in required temperature range for service in which installed. Gages shall have Celsius scale in 1-degree (Fahrenheit scale in 2-degree) graduations and with black number on a white face. The pointer shall be adjustable. Rigid stem type temperature gages shall be provided in thermal wells located within 1525 mm (5 feet) of the finished floor. Universal adjustable angle type or remote element type temperature gages shall be provided in thermal wells located 1525 to 2135 mm (5 to 7 feet) above the finished floor. Remote element type temperature gages shall be provided in thermal wells located 2135 mm (7 feet) above the finished floor.

2.3.2. Vacuum and Pressure Gages: Comply with ASME B40.100 and provide with throttling type needle valve or a pulsation dampener and shut-off valve. Gage shall be a minimum of 90 mm (3-1/2 inches) in diameter with a range from 0 kPa (0 psig) to approximately 1.5 times the maximum system working pressure. Each gage range shall be selected so that at normal operating pressure, the needle is within the middle-third of the range.

2.3.3. Suction: 101 kPa (30 inches Hg) vacuum to 1723 kPa (gage) (250 psig).

2.3.4. Discharge: 0 to 3445 kPa (gage) (0 to 500 psig).

2.4. **PIPE SUPPORTS**

2.4.1. <u>Indoor supports</u>

2.4.1.1. Refer to specification Section 23 05 11, COMMON WORK RESULTS FOR HVAC.

2.4.2. Outdoor supports

2.4.2.1. Refer to details on the drawings. Supports resting on concrete pavers of suitable size.

2.4.2.2. Provide adequate length of unistrut horizontal support to accommodate all piping and electrical conduits. If necessary, use multiple supports in parallel.

2.4.2.3. Piping Clamps: install 2-hole galvanized pipe straps, mounted to the roof support using fasteners available locally. Ensure that there is no direct contact between the copper refrigerant piping and the galvanized straps.

2.4.2.4. Standard of Acceptance: Miro Industries, Portable Pipe Hangers. Min. height above ground: 150 mm.

2.5. REFRIGERANTS AND OIL

2.5.1. Provide EPA approved refrigerant and oil for proper system operation.

2.6. PIPE INSULATION FOR DX HVAC SYSTEMS

2.6.1. Application: all refrigerant suction lines, all hot gas discharge lines.

2.6.2. Insulation materials shall have a closed cell structure to prevent moisture from wicking which makes it an efficient insulation.

2.6.3. Insulation materials shall be manufactured without the use of CFC's, HFC's or HCFC's. It is also formaldehyde free, low VOCs, fiber free, dust free and resists mold and mildew.

2.6.4. Insulation materials shall have a flame-spread index of less than 25 and a smoke-developed index of less than 50 as tested in accordance with ASTM E 84. In addition, the products, when tested, shall not melt or drip flaming particles, and the flame shall not be progressive.

2.6.5. Insulation materials shall have a maximum thermal conductivity of 0.27 Btu-in./h-ft2-°F at a 75°F mean temperature as tested in accordance with ASTM C 177 or ASTM C 518.

2.6.6. Insulation materials shall have a maximum water vapor transmission of 0.08 perm-inches when tested in accordance with ASTM E 96, Procedure A.

2.6.7. Insulation shall be a flexible, closed-cell elastomeric pipe insulation: AP Armaflex, AC Accoflex. Adhesive shall be Armaflex 520, 520 Black or 520 BLV Adhesive. The insulation must conform to ASTM C534 Grade 1, Type I.

2.6.8. Sizes

2.6.8.1. Wall Thickness (nominal): 3/8”, 1/2”, 3/4”, 1”, 1-1/2”, 2” (10, 13, 19, 25, 38, 50mm)

2.6.8.2. Inside Diameter, Tubular: 3/8” ID to 10”ID (10mm ID to 250mm)

2.6.9. Specifications Compliance:

2.6.9.1. ASTM C 534, Type I — Grade 1
2.6.9.2. ASTM D 1056, 2B1
2.6.9.3. ASTM E 84, NFPA 255, UL723
2.6.9.4. ASTM G21/C1338
2.6.9.5. ASTM G22
2.6.9.6. CAN/ULC S102

2.6.10. Accessories

2.6.10.1. ArmaFlex 520 and 520 Black Adhesive – Air-drying, solvent-based contact adhesive for strong bonds and tight seams.
2.6.10.2. ArmaFlex BLV – Black Low VOC Air-drying, solvent-based contact adhesive
2.6.10.3. ArmaFlex Insulation Tape – black foam, pressure-sensitive seam tape
2.6.10.4. Armacell Fabricated Fittings – Made to order pre-fabricated fittings in Tees, Elbows, P-Traps and more
2.6.10.5. ArmaFix Insulation Pipe Hangers – Easy-to-use insulated pipe hanger supports that protect against compression, up to 1” wall thickness.

2.6.11. Standard of Acceptance – refrigerant piping insulation: Armaflex

2.6.12. Outdoor protection: all refrigerant piping mounted outdoors shall have its insulation protected by aluminum jacket as follows:

2.6.12.1. The thickness of aluminum jacketing used shall be per the requirements of ASTM C1729 but not less than 0.016" (0.41mm).

2.6.12.2. Jacketing has a bare smooth finished outer surface and comes standard with a 3-mil thick polyfilm moisture barrier heat laminated to the interior surface to

help prevent corrosion of the jacketing and the underlying metal pipe, vessel, or equipment.

2.6.12.3. Moisture barrier has been tested for flammability using the industry standard ASTM E84 test method. The results were:

2.6.12.3.1. ASTM E84 Flame Spread Index: 0
2.6.12.3.2. ASTM E84 Smoke Developed Index: 5

2.6.12.4. Standard of Acceptance exterior insulation jacket: John Mansville

PART 3 - EXECUTION

3.1. **INSTALLATION**

3.1.1. Install refrigerant piping and refrigerant accessories in accordance with ASHRAE Standard 15 and ASME B31.5 and the equipment manufacturer’s instructions.

3.1.2. Install piping as short as possible, with a minimum number of joints, elbow and fittings.

3.1.3. Install piping with adequate clearance between pipe and adjacent walls and hangers to allow for service and inspection. Space piping, including insulation, to provide 25 mm (1 inch) minimum clearance between adjacent piping or other surface. Use pipe sleeves through walls, floors, and ceilings, sized to permit installation of pipes with full thickness insulation.

3.1.4. Locate and orient valves to permit proper operation and access for maintenance of packing, seat and disc. Generally locate valve stems in overhead piping in horizontal position. Provide a union adjacent to one end of all threaded end valves. Control valves usually require reducers to connect to pipe sizes shown on the drawing.

3.1.5. Install hangers and supports per ASME B31.5 and the refrigerant piping manufacturer's recommendations.

3.1.6. Slope refrigerant piping as follows:

3.1.6.1. Install horizontal hot gas discharge piping with ½" per 10 feet downward slope away from the compressor.

3.1.6.2. Install horizontal suction lines with 1/2 inch per 10 feet downward slope to the compressor, with no long traps or dead ends which may cause oil to separate from the suction gas and return to the compressor in damaging slugs.

3.1.6.3. Install traps and double risers where indicated, and where required to entrain oil in vertical runs.

3.1.6.4. Liquid lines may be installed level.

3.1.7. Install strainers immediately ahead of each expansion valve, solenoid valve, hot gas bypass valve, compressor suction valve, and as required to protect refrigerant piping system components.

3.1.8. Install moisture/liquid indicators in liquid lines between filter/driers and thermostatic expansion valves and in liquid line to receiver (where applicable).

3.1.9. Install unions to allow removal of solenoid valves, pressure regulating valves, expansion valves, and at connections to compressors and evaporators.

3.1.10. Joint Construction:

3.1.10.1. Brazed Joints: Comply with AWS "Brazing Handbook" and with filler materials complying with AWS A5.8/A5.8M.

3.1.10.2. Use Type BcuP, copper-phosphorus alloy for joining copper socket fittings with copper tubing.

3.1.10.3. Use Type BAg, cadmium-free silver alloy for joining copper with bronze or steel.

3.1.10.4. Swab fittings and valves with manufacturer's recommended cleaning fluid to remove oil and other compounds prior to installation.

3.1.10.5. Pass nitrogen gas through the pipe or tubing to prevent oxidation as each joint is brazed. Cap the system with a reusable plug after each brazing operation to retain the nitrogen and prevent entrance of air and moisture.

3.1.10.6. Protect refrigerant system during construction against entrance of foreign matter, dirt and moisture; have open ends of piping and connections to compressors, condensers, evaporators and other equipment tightly capped until assembly.

3.1.10.7. Pipe relief valve discharge to outdoors for systems containing more than 45 kg (100 lbs) of refrigerant.

3.1.11. Firestopping: Fill openings around uninsulated piping penetrating floors or fire walls, with water-proof firestop material.

3.2. **PIPE AND TUBING INSULATION**

3.2.1. Insulate all suction piping, including traps

3.2.2. Outdoors: aluminum protective jacket

3.2.3. Protect insulation at all support points; use painted galvanized metallic saddles covering a min of 180^{O} around the pipe. Unpainted galvanized saddles in direct contact with the aluminum jacket is prohibited.

3.3. **SIGNS AND IDENTIFICATION**

3.3.1. Each refrigerating system erected on the premises shall be provided with an easily legible permanent sign securely attached and easily accessible, indicating thereon the name and address of the installer, the kind and total number of pounds of refrigerant required in the system for normal operations, and the field test pressure applied.

3.3.2. Systems containing more than 50 kg (110 lb) of refrigerant shall be provided with durable signs, in accordance with ANSI A13.1 and ANSI Z535.1, having letters not less than 13 mm (1/2 inch) in height designating:

3.3.3. Valves and switches for controlling refrigerant flow, the ventilation and the refrigerant compressor(s).

3.3.4. Signs on all exposed high pressure and low pressure piping installed outside the machinery room, with name of the refrigerant and the letters "HP" or "LP."

3.4. **VALVE INSTALLATION**

3.4.1. General: Install refrigerant valves where indicated, and in accordance with manufacturer's instructions.

3.4.2. Install globe valves on each side of strainers and driers, in liquid and suction lines at evaporators, and elsewhere as indicated.

3.4.3. Install a full sized, 3-valve bypass around each drier.

3.4.4. Install solenoid valves ahead of each expansion valve and hot-gas bypass valve. Install solenoid valves in horizontal lines with coil at the top.

3.4.5. Coordinate electrical requirements and connections.

3.4.6. Thermostatic expansion valves may be mounted in any position, as close as possible to the evaporator.

3.4.7. Where refrigerant distributors are used, mount the distributor directly on the expansion valve outlet.

3.4.8. Install the valve in such a location so that the diaphragm case is warmer than the bulb. Verify proper location for bulb with valve manufacturer.

3.4.9. Secure the bulb to a clean, straight, horizontal section of the suction line using two bulb straps. Do not mount bulb in a trap or at the bottom of the line.

3.4.10. Where external equalizer lines are required make the connection where it will clearly reflect the pressure existing in the suction line at the bulb location.

3.4.11. Install pressure regulating and relieving valves as required by ASHRAE Standard 15.

3.5. **FIELD QUALITY CONTROL**

3.5.1. Prior to initial operation examine and inspect piping system for conformance to plans and specifications and ASME B31.5. Correct equipment, material, or work rejected because of defects or nonconformance with plans and specifications, and ANSI codes for pressure piping.

3.5.2. After completion of piping installation and prior to initial operation, conduct test on piping system according to ASME B31.5. Furnish materials and equipment required for tests. Perform tests in the presence of Resident Engineer. If the test fails, correct defects and perform the test again until it is satisfactorily done and all joints are proved tight.

3.5.3. Every refrigerant-containing parts of the system that is erected on the premises, except compressors, condensers, evaporators, safety devices, pressure gages, control mechanisms and systems that are factory tested, shall be tested and proved tight after complete installation, and before operation.

3.5.4. The high and low side of each system shall be tested and proved tight at not less than the lower of the design pressure or the setting of the pressure relief device protecting the high or low side of the system, respectively, except systems erected on the premises using non-toxic and non-flammable Group A1 refrigerants with copper tubing not exceeding DN 18 (NPS 5/8). This may be tested by means of the refrigerant charged into the system at the saturated vapor pressure of the refrigerant at 20 degrees C (68 degrees F) minimum.

3.5.5. Test Medium: A suitable dry gas such as nitrogen or shall be used for pressure testing. The means used to build up test pressure shall have either a pressure limiting device or pressure-reducing device with a pressure-relief device and a gage on the outlet side. The pressure relief device shall be set above the test pressure but low enough to prevent permanent deformation of the system components.

3.6. **SYSTEM TEST AND CHARGING**

3.6.1. Provide a full charge of refrigerant and oil, to suit the capacity of the system, including lengths of refrigerant piping and receivers. System Test and Charging: As recommended by the equipment manufacturer or as follows:

3.6.2. Connect a drum of refrigerant to charging connection and introduce enough refrigerant into system to raise the pressure to 70 kPa (10 psi) gage. Close valves and disconnect refrigerant drum. Test system for leaks with halide test torch or other approved method suitable for the test gas used. Repair all leaking joints and retest.

3.6.3. Connect a drum of dry nitrogen to charging valve and bring test pressure to design pressure for low side and for high side. Test entire system again for leaks.

3.6.4. Evacuate the entire refrigerant system by the triplicate evacuation method with a vacuum pump equipped with an electronic gage reading in mPa (microns). Pull the system down to 665 mPa (500 microns) 665 mPa (2245.6 inches of mercury at 60 degrees F) and hold for four hours then break the vacuum with dry nitrogen (or refrigerant). Repeat the evacuation two more times breaking the third vacuum with the refrigeration to be charged and charge with the proper volume of refrigerant.

Table of Contents

PART 1 - GENERAL

1.1. **GENERAL**

1.1.1. System Description

1.1.1.1. The air conditioning system shall be a split system with Variable Compressor Speed Inverter Technology (VCSI), charged with R410A refrigerant.

1.1.1.2. The Y-Series system shall consist of PUHY outdoor unit or approved alternative, multiple indoor units, and M-NET DDC (Direct Digital Controls). The sum of connected capacity of all indoor air handlers shall range from 50% to 130% of outdoor rated capacity.

1.2. **DEFINITIONS:**

1.2.1. Energy Efficiency Ratio (EER): The ratio of net cooling capacity is Btu/h to total rate of electricity input in watts under designated operating conditions (Btu hour/Watt).

1.2.2. Seasonal Energy Efficiency Ratio (EER): The ratio of the total cooling output of an air conditioner during its normal annual usage period for cooling in Btu/h divided by total electric energy input in watts during the same period (Btu hour/Watt).

1.3. **RELATED WORK**

1.3.1. Section 23 05 11, COMMON WORK RESULTS FOR HVAC
1.3.2. Section 23 23 00, REFRIGERANT PIPING.

1.4. **SUBMITTALS**

1.4.1. Submit in accordance with specification Section 01 23 33, SHOP DRAWINGS AND PRODUCT DOCUMENTATION

1.4.2. Manufacturer's literature and data:

1.4.2.1. Sufficient information, including capacities, pressure drops and piping connections clearly presented, shall be included to determine compliance with drawings and specifications

1.4.2.2. Unit Dimensions required clearances, operating weights accessories and start-up instructions.

1.4.2.3. Electrical requirements, wiring diagrams, interlocking and control wiring showing factory installed and portions to be field installed.

1.4.2.4. Mounting and flashing of the roof curb to the roofing structure with coordinating requirements for the roof membrane system.

1.4.3. Certification: Submit proof of specified ARI Certification.

1.4.4. Performance Rating: Submit catalog selection data showing equipment ratings and compliance with required sensible-to-heat-ratio, energy efficiency ratio (EER), and coefficient of performance (COP).

1.4.5. Operating and Maintenance Manual: Submit three copies of Operating and Maintenance manual to Consultant two weeks prior to final inspection.

1.4.6. Completed System Readiness Checklists provided by the Commissioning Agent and completed by the contractor, signed by a qualified technician and dated on the date of completion

1.5. **QUALITY ASSURANCE**

1.5.1. The units shall be listed by Electrical Testing Laboratories (ETL) and bear the ETL label.

1.5.2. All wiring shall be in accordance with the Canadian Electrical Code.

1.5.3. The units shall be rated in accordance with ARI Standard 210 and bear the ARI label.

1.5.4. The units shall be manufactured in a facility registered to ISO 9001 and ISO14001 which are a set of standards applying to environmental protection set by the International Standard Organization (ISO).

1.5.5. A full charge of R410A and oil for the required length of refrigerant tubing shall be provided in the condensing unit.

1.5.6. A dry air holding charge shall be provided in the evaporator.

1.5.7. System efficiency shall meet or exceed 19.0 SEER and 10.6 HSPF.

1.6. **DELIVERY, STORAGE AND HANDLING**

1.6.1. Unit shall be stored and handled according to the manufacturer's recommendation.

1.6.2. The wireless controller shall be shipped inside the carton with the indoor unit and able to withstand 40.5°C (105°F) storage temperatures and 95% relative humidity.

1.7. **CONTROLS**

1.7.1. The control system shall consist of a low voltage controller c/w HoneyWell Residential 2 stage heat thermostats and DKN + Adaptor or approved alternative for each indoor unit.

1.7.2. System controls and control components shall be installed in accordance with the manufacturer's written installation instructions.

1.8. **WARRANTY**

1.8.1. The units shall have a manufacturer's warranty for a period of five (5) years from date of installation.

1.8.2. The compressor shall have a warranty of seven (7) years from date of installation. If, during this period, any part should fail to function properly due to defects in workmanship or material, it shall be replaced or repaired at the discretion of the manufacturer.

1.8.3. This warranty does not include labour. Manufacturer shall have twenty years experience in the Canadian market.

1.9. **PERFORMANCE**

1.9.1. Each system shall perform in accordance to the ratings shown in the equipment schedules.

1.9.2. Performance shall be based on 26.7°DBT, 19.4°WBT (80°DBT, 67°WBT) for the indoor unit and 35°C DBT, 23.9°C WBT (95°FDBT, 75°FWBT) for the outdoor unit.

1.10. **STANDARD OF ACCEPTANCE**

1.10.1. Indoor units Base of Design:

1.10.1.1. Wall mounted, capacity as noted on the equipment schedules

1.10.2. Outdoor units base of design: Daikin, Aurora Heat pump series, capacity as noted on the equipment schedules

1.10.3. Alternate manufacturer: Mitsubishi

PART 2 - PRODUCTS

2.1. **INDOOR UNITS**

2.1.1. General

2.1.1.1. The indoor unit shall be factory assembled, wired and run tested. Contained within the unit shall be all factory wiring, internal piping, control circuit board and fan motor. The unit shall have a self-diagnostic function, 3-minute time delay mechanism an auto restart function, an emergency operation function and a test run switch. Indoor unit and refrigerant pipes shall be charged with dry air before shipment from the factory.

2.2. **(WALL MOUNTED) INDOOR UNIT**

2.2.1. General:

2.2.1.1. The unit shall be a wall-mounted indoor unit section and shall have a modulating linear expansion device and a flat front. The PKFY shall be used with the R2-Series outdoor unit and BC Controller, Y-Series outdoor unit, or S-Series

outdoor unit. The PKFY shall support individual control using M-NET DDC controllers.

2.2.2. Indoor Unit

2.2.2.1. The indoor unit shall be factory assembled, wired and run tested. Contained within the unit shall be all factory wiring, piping, electronic modulating linear expansion device, control circuit board and fan motor. The unit shall have a self-diagnostic function, 3-minute time delay mechanism, an auto restart function, and a test run switch. Indoor unit and refrigerant pipes shall be charged with dehydrated air before shipment from the factory.

2.2.3. Unit Cabinet:

2.2.3.1. All casings, regardless of model size, shall have the same white finish
2.2.3.2. Multi directional drain and refrigerant piping offering four (4) directions for refrigerant piping and two (2) directions for draining shall be standard.
2.2.3.3. There shall be a separate back plate which secures the unit firmly to the wall.

2.2.4. Fan:

2.2.4.1. The indoor fan shall be an assembly with one or two line-flow fan(s) direct driven by a single motor.
2.2.4.2. The indoor fan shall be statically and dynamically balanced to run on a motor with permanently lubricated bearings.
2.2.4.3. A manual adjustable guide vane shall be provided with the ability to change the airflow from side to side (left to right).
2.2.4.4. A motorized air sweep louver shall provide an automatic change in airflow by directing the air up and down to provide uniform air distribution.

2.2.5. Filter:

2.2.5.1. Return air shall be filtered by means of an easily removable, washable filter.

2.2.6. Coil:

2.2.6.1. The indoor coil shall be of nonferrous construction with smooth plate fins on copper tubing.
2.2.6.2. The tubing shall have inner grooves for high efficiency heat exchange.
2.2.6.3. All tube joints shall be brazed with phos-copper or silver alloy.
2.2.6.4. The coils shall be pressure tested at the factory.

2.2.6.5. A condensate pan and drain shall be provided under the coil.

2.2.6.6. Both refrigerant lines to the PKFY indoor units shall be insulated in accordance with the installation manual.

2.2.7. Electrical:

2.2.7.1. The unit electrical power shall be 208/230 volts, 1-phase, 60 hertz.

2.2.7.2. The system shall be capable of satisfactory operation within voltage limits of 187-228 volts (208V/60Hz) or 207-253 volts (230V/60Hz)

2.2.8. Controls:

2.2.8.1. This unit shall use controls provided by Mitsubishi Electric Cooling & Heating to perform functions necessary to operate the system. Please refer to Part 4 of this guide specification for details on controllers and other control options.

2.2.8.2. The unit shall be able to control external backup heat.

2.2.8.3. The unit shall have a factory built in receiver for wireless remote control

2.2.8.4. Indoor unit shall compensate for the higher temperature sensed by the return air sensor compared to the temperature at level of the occupant when in HEAT mode. Disabling of compensation shall be possible for individual units to accommodate instances when compensation is not required.

2.2.8.5. Control board shall include contacts for control of external heat source. External heat may be energized as second stage with 1.8°F – 9.0°F adjustable deadband from set point.

2.2.8.6. Indoor unit shall include no less than four (4) digital inputs capable of being used for customizable control strategies.

2.2.8.7. Indoor unit shall include no less than three (3) digital outputs capable of being used for customizable control strategies.

2.3. **OUTDOOR UNIT – PUHY SERIES**

2.3.1. General

2.3.1.1. The Y-Series PUHY outdoor unit shall be specifically used with CITY MULTI VRF components or approved alternative. The PUHY outdoor units shall be equipped with multiple circuit boards that interface to the M-NET controls system and shall perform all functions necessary for operation. Each outdoor unit module shall be completely factory assembled, piped, wired and run tested at the factory.

2.3.1.2. The model nomenclature and unit requirements are shown below. All units requiring a factory supplied twinning kit shall be piped together in the field, without the need for equalizing line(s). If an alternate manufacturer is selected, any additional material, cost, and labor to install additional lines shall be incurred by the contractor.

2.3.1.3. Outdoor unit shall have a sound rating no higher than 60 dB(A) individually or 65 dB(A) twinned. Units shall have a sound rating no higher than 50 dB(A) individually or 55 dB(A) twinned while in night mode operation. If an alternate manufacturer is selected, any additional material, cost, and labor to meet published sound levels shall be incurred by the contractor.

2.3.1.4. Outdoor unit shall be able to connect to up to 50 indoor units depending upon model.

2.3.1.5. Both refrigerant lines from the outdoor unit to indoor units shall be insulated.

2.3.1.6. The outdoor unit shall have an accumulator with refrigerant level sensors and controls.

2.3.1.7. The outdoor unit shall have a high pressure safety switch, over-current protection and DC bus protection.

2.3.1.8. The outdoor unit shall have the ability to operate with a maximum height difference of 164 feet (294 feet optional) and have a total refrigerant tubing length of 3280 feet. The greatest length is not to exceed 541 feet between the outdoor unit and the indoor units without the need for line size changes or traps.

2.3.1.9. The outdoor unit shall be capable of operating in heating mode down to -4□F ambient temperature or cooling mode down to 23□F ambient temperature, without additional low ambient controls. If an alternate manufacturer is selected, any additional material, cost, and labor to meet low ambient operating condition and performance shall be incurred by the contractor.

2.3.1.10. The outdoor unit shall be capable of operating in cooling mode down to -10□F with optional manufacturer supplied low ambient kit.

2.3.1.11. Manufacturer supplied low ambient kit shall be provided with predesigned control box rated for outdoor installation and capable of controlling kit operation automatically in all outdoor unit operation modes.

2.3.1.12. Manufacturer supplied low ambient kit shall be listed by Electrical Laboratories (ETL) and bear the ETL label.

2.3.1.13. Manufacturer supplied low ambient kit shall be factory tested in low ambient temperature chamber to ensure operation. Factory performance testing data shall be available when requested.

2.3.1.14. The outdoor unit shall be provided with a manufacturer supplied 20 gauge hot dipped galvanized snow /hail guard. The snow/hail guard protects the outdoor coil surfaces from hail damage and snow build-up in severe climates.

2.3.1.15. The outdoor unit shall have a high efficiency oil separator plus additional logic controls to ensure adequate oil volume in the compressor is maintained.

2.3.2. Unit Cabinet:

2.3.2.1. The casing(s) shall be fabricated of galvanized steel, bonderized and finished. Units cabinets shall be able to withstand 960 hours per ASTM B117 criteria for seacoast protected models (–BS models).

2.3.3. Fan:

2.3.3.1. Each outdoor unit module shall be furnished with one direct drive, variable speed propeller type fan.

2.3.3.2. The fan motor shall have inherent protection, have permanently lubricated bearings, and be completely variable speed. The fan shall be factory set for operation under 0 in. WG external static pressure, but capable of normal operation under a maximum of 0.24 in. WG external static pressure via dipswitch.

2.3.3.3. The fan motor shall be mounted for quiet operation.

2.3.3.4. The fan shall be provided with a raised guard to prevent contact with moving parts.

2.3.3.5. The outdoor unit shall have vertical discharge airflow.

2.3.4. Refrigerant

2.3.4.1. R410A refrigerant shall be required for PUHY-T/Y(S)KMU-A outdoor unit systems.

2.3.4.2. Polyolester (POE) oil shall be required. Prior to bidding, manufacturers using alternate oil types shall submit material safety data sheets (MSDS) and comparison of hygroscopic properties for alternate oil with list of local suppliers stocking alternate oil for approval at least two weeks prior to bidding.

2.3.5. Coil:

2.3.5.1. The outdoor coil shall be of nonferrous construction with lanced or corrugated plate fins on copper tubing.

2.3.5.2. The coil fins shall have a factory applied corrosion resistant blue-fin finish.

2.3.5.3. The coil shall be protected with an integral metal guard.

2.3.5.4. Refrigerant flow from the outdoor unit shall be controlled by means of an inverter driven compressor.

2.3.5.5. The outdoor coil shall include 4 circuits with two position valves for each circuit, except for the last stage.

2.3.6. Compressor:

2.3.6.1. Each outdoor unit module shall be equipped with one inverter driven scroll hermetic compressor. Non inverter-driven compressors, which cause inrush current (demand charges) and require larger wire sizing, shall not be allowed.

2.3.6.2. A crankcase heater(s) shall be factory mounted on the compressor(s).

2.3.6.3. The outdoor unit compressor shall have an inverter to modulate capacity. The capacity shall be completely variable with an operating range of 5% ~ 100% depending upon unit capacity, operation, and configuration.

2.3.6.4. The compressor shall be equipped with an internal thermal overload.

2.3.6.5. The compressor shall be mounted to avoid the transmission of vibration.

2.3.7. Controls:

2.3.7.1. The outdoor unit shall have the capability of up to 8 levels of demand control for each refrigerant system

2.3.8. Electrical:

2.3.8.1. The outdoor unit electrical power shall be as noted on the equipment schedules.

2.3.8.2. The outdoor unit shall be capable of satisfactory operation within voltage limits of +/- 10% volts variance from the value noted in the equipment schedules.

2.3.8.3. The outdoor unit shall be controlled by integral microprocessors.

2.3.8.4. The control circuit between the indoor units, BC Controller and the outdoor unit shall be 24VDC completed using a 2-conductor, twisted pair shielded cable to provide total integration of the system.

2.4. **CONTROLS**

2.4.1. N/A

PART 3 - INSTALLATION

3.1. **REFRIGERANT PIPEWORK**

3.1.1. Supply, install, test and commission all interconnecting refrigeration pipework between the outdoor and indoor units. Also refer to section 23 23 00 REFRIGERANT PIPING

3.1.2. All pipework to be carried out in refrigerant quality ACR copper tubing and complete with the appropriate headers and joints. All pipework must be suitable for R410A.

3.1.3. Longest possible lengths of copper pipe should be utilized to minimize joints on site.

3.1.4. Appropriate refrigeration installation tools must be utilized. Dry Nitrogen must be utilized at all times in the system during brazing.

3.1.5. All pipework (suction and liquid lines) to be insulated with slip on close cell elastomeric pipe insulation (as manufactured by Armaflex or equal and approved) having a wall thickness of not less that ½". Also refer to section 23 23 00 REFRIGERANT PIPING

3.1.6. After installation of pipework, and prior to sealing of insulation joints and starting of equipment, pipework should be pressure tested. 44 PSIG test for 3 minutes minimum, then 217 PSIG for 3 minimum, then 478 PSIG for 3 minutes minimum, then strength test to 600 PSIG check the system for leaks and deformation, then lower the pressure back to 478 PSIG and pressure test for 24 hours and checked for leaks. Vacuumed/dehydrated to 300 microns, and hold at that vacuum for 12 hours (minimum)

3.1.7. Refrigerant (R410A) charge weight must be calculated, to the actual installed length of pipe work in accordance to Mitsubishi recommendations.

3.1.8. The charging should be carried out with an appropriate charging station.

3.1.9. Pipework to be properly fixed and supported at a minimum of 1.5 metres (5 feet) centres or as specified by local code and where required should be run on galvanised trays. All pipework to be labeled with ID number (condensing units ref.) at 3 metre (9 feet) intervals.

3.1.10. Joints in copper pipe shall be brazed. Brazing shall be carried out to the requirements of the local code and as per the Canadian copper & brass development association recommendations.

3.1.11. Coordinate the exact routing of refrigerant piping with existing building services and structural/architectural features of the building.

3.2. **CONDENSATE PIPEWORK**

3.2.1. A condensate line shall be installed to each fan coil unit. This shall be installed and insulated all as per the standard specification. Minimum size of condensate pipes to be 38mm (1½ inch) copper, insulated and pumped or by gravity from each fan coil/cassette, drains to run 1:80 min falls as indicated on drawings.

3.2.2. Coordinate the exact routing of condensate piping with existing building services and structural/architectural features of the building. Maintain slope as indicated.

3.3. **OUTDOOR UNIT**

3.3.1. Install outdoor in strict accordance with the manufacturer's instructions; adhere strictly to all manufacturer's instructions pertaining to clearances around the equipment and between the adjacent condensing units.

3.3.2. Connect equipment to power supply and refrigerant piping. All refrigerant piping final sizing to be calculated by the manufacturer and submitted at shop drawings stage. Calculation shall be based on the total developed length of the lines.

3.4. **INDOOR UNITS**

3.4.1. Install indoor units where noted on the drawings and conform strictly to the manufacturer's instructions. Coordinate location of all indoor units with the existing structural/architectural elements and where applicable, with the ceiling grid, lights and other ceiling-mounted devices.

3.4.2. Connect all refrigerant lines in accordance with the manufacturer's instructions.

3.4.3. A full load of refrigerant shall be supplied for each system, adequate for the system capacity and refrigerant lines lengths.

3.4.4. Make connections to power supply in accordance to the manufacturer's instructions.

3.4.5. Make connections to the BAS in accordance with the sequences of operations and BAS specifications.

3.4.6. Connect all evaporators to a condensate drainage loop, discharging onto the janitorial sink, as noted. Slope the drain lines as specified.

3.4.7. Coordinate the layout of the drainage with the existing radiators, heating pipes and other services. Cut out round sections through the radiator covers where required and pass in between finned elements.

3.5. **CONNECTIONS**

3.5.1. Verify condensate drainage requirements.

3.5.2. Install condensate drain, minimum connection size, with trap and indirect connection to noted discharge point.

3.5.3. Install piping adjacent to units to allow service and maintenance.

3.5.4. Ground equipment and install power wiring, switches, and controls for self contained and split systems.

3.5.5. Connect refrigerant piping to coils with shutoff valves on the suction and liquid lines at the coil and a union or flange at each connection at the coil and condenser.

3.6. **FIELD QUALITY CONTROL**

3.6.1. Perform tests and inspections and prepare test reports.

3.6.2. Tests and Inspections: After installing units and after electrical circuitry has been energized, test units for compliance with requirements. Inspect for and remove shipping bolts, blocks, and tie-down straps. After electrical circuitry has been energized, start units to confirm proper motor rotation and unit operation. Test and adjust controls and safeties. Replace damaged and malfunctioning controls and equipment. Remove and replace malfunctioning units and retest as specified above.

3.7. **STARTUP AND TESTING**

3.7.1. All equipment shall be inspected, started up and adjusted by the trained manufacturer's representatives.

3.7.2. The start-up and adjustment shall be closely coordinated with the BAS Vendor.

3.7.3. The Consultant will observe startup and contractor testing of selected equipment. Coordinate the startup and contractor testing schedules with the Board project Supervisor and Commissioning Agent. Provide a minimum of 7 days prior notice.

3.8. **DEMONSTRATION AND TRAINING**

3.8.1. Provide services of manufacturer's technical representative for four hours to instruct Board personnel in operation and maintenance of units.

3.8.2. Submit training plans and instructor qualifications

Table of Contents

PART 1 - GENERAL

1.1. REFERENCES

1.1.1. Division 00 and Division 01 apply to and are a part of this Section.

1.2. APPLICATION

1.2.1. This Section specifies requirements that are common to Electrical Divisions work Sections and it is a supplement to each Section and is to be read accordingly. Where requirements of this Section contradict requirements of Divisions 00 or 01, conditions of Division 00 or 01 to take precedence.

1.2.2. Advise product vendors of requirements of this Section.

1.3. DEFINITIONS

1.3.1. "concealed" – means hidden from normal sight in furred spaces, shafts, ceiling spaces, walls and partitions.

1.3.2. "exposed" – means work normally visible, including work in equipment rooms, service tunnels, and similar spaces.

1.3.3. "finished" - means when in description of any area or part of an area or a product which receives a finish such as paint, or in case of a product may be factory finished.

1.3.4. "provision" or "provide" (and tenses of "provide") – means supply and install complete.

1.3.5. "install" (and tenses of "install") – means secure in position, connect complete, test, adjust, verify and certify.

1.3.6. "supply" – means to procure, arrange for delivery to site, inspect, accept delivery and administer supply of products; distribute to areas; and include manufacturer's supply of any special cables, standard on site testing, initial start-up, programming, basic commissioning, warranties and manufacturers' assistance to Contractor.

1.3.7. "delete" or "remove" (and tenses of "delete" or "remove") – means to disconnect, make safe, and remove obsolete materials including back boxes and exposed piping and raceways; and patch and repair/finish surfaces to match adjoining similar construction; include for associated re-programming of systems and/or change of documentation identifications to suit deletions, and properly dispose of deleted products off site unless otherwise instructed by Owner and reviewed with Consultant.

1.3.8. "barrier-free" - means when applied to a building and its facilities, that building and its facilities can be approached, entered and used by persons with physical or sensory disabilities in accordance with requirements of local governing building code.

1.3.9. "BAS" – means building automation system; "BMS" – means building management system, "FMS" – means facility management system; and "DDC" means direct digital controls; references to "BAS", "BMS", "FMS" and "DDC" generally mean same.

1.3.10. "governing authority" and/or "authority having jurisdiction" and/or "regulatory authority" and/or "Municipal authority" – means government departments, agencies, standards, rules and regulations that apply to and govern work and to which work must adhere.

1.3.11. "OSHA" and "OHSA" – stands for Occupational Safety and Health Administration and Occupational Health and Safety Act, and wherever either one is used, they are to be read to mean local governing occupational health and safety regulations that apply to and govern work and to which work must adhere, regardless if Project falls within either authority's jurisdiction.

1.3.12. "Mechanical Divisions" - refers to Divisions as specifically noted, and which work as defined in Specifications and/or on drawings is responsibility of Mechanical Contractor, unless otherwise noted.

1.3.13. "Electrical Divisions" – refers to Divisions as specifically noted, and which work as defined in Specifications and/or on drawings is responsibility of Electrical Contractor, unless otherwise noted.

1.3.14. "Consultant" – means person, firm or corporation identified as such in Agreement or Documents, and is licensed to practice in Place of the Work, and has been appointed by Owner to act for Owner in a professional capacity in relation to the Work.

1.3.15. Wherever words "indicated", "shown", "noted", "listed", or similar words or phrases are used in Contract Documents they are understood, unless otherwise defined, to mean product referred to is "indicated", "shown", "listed", or "noted" on Contract Documents.

1.3.16. Wherever words "reviewed", "satisfactory", "as directed", "submit", or similar words or phrases are used in Contract Documents they are understood, unless otherwise defined, to mean that work or product referred to is "reviewed by", "to the satisfaction of", "submitted to", etc., Consultant.

1.4. **DOCUMENTS**

1.4.1. Documents for bidding include but are not limited to issued Drawings, Specifications and Addenda.

1.4.2. Drawings and Specifications are portions of Contract Documents and identify labour, products and services necessary for performance of work and form a basis for determining pricing. They are intended to be cooperative. Perform work that is shown,

specified, or reasonably implied on drawings but not mentioned in Specification, or vice-versa, as though fully covered by both.

1.4.3. Review Drawings and Specification in conjunction with documents of other Divisions and, where applicable, Code Consultant's report.

1.4.4. Unless otherwise specifically noted in Specifications and/or on Drawings, Sections of Electrical Divisions are not intended to delegate functions nor to delegate work and supply of materials to any specific trade, but rather to generally designate a basic unit of work, and Sections are to be read as a whole.

1.4.5. Drawings are performance drawings, diagrammatic, and show approximate locations of equipment and materials. Any information regarding accurate measurement of building is to be taken on site. Do not scale Drawings, and do not use Drawings for prefabrication work

1.4.6. Drawings are intended to convey scope of work and do not show architectural and structural details. Provide fittings, offsets, transformations and similar items required as a result of obstructions and other architectural and/or structural details but not shown on Drawings.

1.4.7. Locations of equipment and materials shown may be altered, when reviewed by Consultant, to meet requirements of equipment and/or materials, other equipment or systems being installed, and of building, all at no additional cost to Contract.

1.4.8. Specification does not generally indicate specific number of items or amounts of material required. Specification is intended to provide product data and installation requirements. Refer to schedules, Drawings (layouts, riser diagrams, schematics, details) and Specification to provide correct quantities. Singular may be read as plural and vice versa.

1.4.9. Starter/motor control centre (MCC)/variable frequency drive (VFD) schedule drawings are both mechanical and electrical, and apply to work of Mechanical Divisions and Electrical Divisions. Be responsible for reviewing starter, MCC, VFD, and motor specification requirements of Mechanical Divisions specifications and drawings, prior to Bid submission. Confirm and coordinate exact scope of work and responsibility of work between Mechanical Divisions and Electrical Divisions.

1.4.10. Drawings and Specifications are prepared solely for use by party with whom Consultant has entered into a contract and there are no representations of any kind made by Consultant to any other party.

1.4.11. .In case of discrepancies or conflicts between Drawings and Specifications, Documents will govern in order specified in "General Conditions", however, when scale and date of

Drawings are same, or when discrepancy exists within Documents, include most costly arrangement.

1.5. **METRIC AND IMPERIAL MEASUREMENTS**

1.5.1. Generally, both metric and imperial units of measurement are given in Sections of Specification governed by this section. Measurement conversions may be generally "soft" and rounded off. Exact measurements to be confirmed based on application. Where measurements are related to installation and onsite applications, confirm issued document measurements with applicable local code requirements, and/or as applicable, make accurate measurements onsite. Where significant discrepancies are found, immediately notify Consultant for direction.

1.6. **EXAMINATION OF BID DOCUMENTS AND SITE**

1.6.1. Carefully examine Documents and visit site to determine and review existing site conditions that will or may affect work, and include for such conditions in Bid Price.

1.6.2. Report to Consultant, prior to Bid Submittal, any existing site condition that will or may affect performance of work as per Documents. Failure to do so will not be grounds for additional costs.

1.6.3. Upon finding discrepancies in, or omissions from Documents, or having doubt as to their meaning or intent, immediately notify Consultant, in writing.

1.7. **WORK STANDARDS**

1.7.1. Where any code, regulation, bylaw, standard, contract form, manual, printed instruction, and installation and application instruction is quoted it means, unless otherwise specifically noted, latest published edition at time of submission of Bids adopted by and enforced by local governing authorities having jurisdiction. Include for compliance with revisions, bulletins, supplementary standards or amendments issued by local governing authorities.

1.7.2. Where regulatory codes, standards and regulations are at variance with Drawings and Specification, more stringent requirement will apply unless otherwise directed by Owner and reviewed with Consultant.

1.7.3. Supplementary mandatory Specifications and requirements to be used in conjunction with project include but are not limited to following:

1.7.3.1. American Society of Heating, Refrigerating and Air Conditioning Engineers, Inc., (ASHRAE);

1.7.3.2. American National Standards Institute (ANSI);

1.7.3.3. ANSI/ASHRAE Standard 90.1, Energy Standard for Buildings Except Low-Rise Residential Buildings;
1.7.3.4. Building Industry Consulting Services, International (BICSI);
1.7.3.5. Canadian Standards Association (CSA);
1.7.3.6. CSA C282, "Emergency Electrical Power Supply For Buildings";
1.7.3.7. CSA Z432, "Safeguarding of Machinery";
1.7.3.8. CSA Z462, "Workplace Electrical Safety";
1.7.3.9. Electrical and Electronic Manufacturers Association of Canada (EEMAC);
1.7.3.10. Electrical Safety Authority (ESA);
1.7.3.11. Electronic Industries Association (EIA);
1.7.3.12. Illuminating Engineering Society (IES);
1.7.3.13. Institute of Electrical and Electronic Engineers (IEEE);
1.7.3.14. National Building Code of Canada (NBC);
1.7.3.15. National Electrical Manufacturers Association (NEMA);
1.7.3.16. National Fire Protection Association (NFPA);
1.7.3.17. Occupational Health and Safety Act (OHSA);
1.7.3.18. Occupational Health and Safety Act - Ontario Regulation 632, "Confined Spaces";
1.7.3.19. Ontario Building Code (OBC);
1.7.3.20. Ontario Electrical Safety Code (OESC);
1.7.3.21. Technical Standards and Safety Authority (TSSA);
1.7.3.22. Telecommunications Industry Association (TIA);
1.7.3.23. Underwriters' Laboratories of Canada (ULC);
1.7.3.24. Material Safety Data Sheets by product manufacturers;
1.7.3.25. local utility inspection permits;
1.7.3.26. codes, standards, and regulations of local governing authorities having jurisdiction;
1.7.3.27. additional codes and standards listed in Trade Sections;
1.7.3.28. Owner's standards.

1.7.4. Provide applicable requirements for barrier free access in accordance with latest edition of local governing building code.

1.7.5. Where any governing Code, Regulation, or Standard requires preparation and submission of special details or drawings for review they are to be prepared and submitted to appropriate authorities. Be responsible for costs associated with these submittals.

1.7.6. Unless otherwise specified install, equipment in accordance with equipment manufacturer's recommendations and instructions, and requirements of governing Codes, Standards, and Regulations. Governing Codes, Standards, and Regulations take precedence over manufacturer's instructions. Notify Consultant in writing of conflicts between Contract Documents and manufacturer's instructions.

1.7.7. Work is to be performed by journeyperson tradesmen who perform only work that their certificates permit, or by apprentice tradesmen under direct on site supervision of experienced journeyperson tradesman. Journeyperson to apprentice ratio is not to exceed ratio determined by the Board as stated in Ontario College of Trades and Apprenticeship Act or local equivalent governing body in Place of the Work.

1.7.8. Journeyperson tradesmen are to have copy of valid trade certificates available at site for review by Consultant at any time.

1.7.9. Maintain experienced and qualified superintendent on-site at times when work is being performed.

1.7.10. Coordinate work inspection reviews and approvals with governing inspection department to ensure construction schedule is not delayed. Be responsible for prompt notification of deficiencies to Consultant and submission of reports and certificates to Consultant.

1.7.11. Properly protect equipment and materials on site from damage and defacement due to elements and work of trades, to satisfaction of Owner and reviewed with Consultant.

Equipment and materials are to be in new condition upon Substantial Performance of the W

1.8. **PERMITS, CERTIFICATES, APPROVALS AND FEES**

1.8.1. Contact and confirm with local authorities having jurisdiction including utility providers, requirements for approvals from such authorities.

1.8.2. Submit required applications, shop drawings, electrical distribution system protection device coordination studies, and short circuit calculations, and any other information requested by local authority.

1.8.3. Provide ample notification to authorities having jurisdiction to perform required on-site inspection of work, allowing sufficient lead time to correct deficiencies in a manner that will not impede schedule of completion of Work. If any defect, deficiency or non-compliancy is found in work by inspection, be responsible for costs of such inspection, including any related expenses, making good and return to site, until work is passed by governing authorities.

1.8.4. Obtain and submit to Consultant, approval/inspection certificates issued by governing authorities to confirm that Work as installed is in accordance with rules and regulations of local governing authorities and are acceptable by such authorities.

1.8.5. Include in each copy of operating and maintenance instruction manuals, copies of approvals and inspection certificates issued by regulatory authorities.

1.8.6. Where electromagnetic locks are provided whether by this Division or by others, be responsible for obtaining and paying for required certificates of work with regards to such electromagnetic lock work.

1.9. **WORKPLACE SAFETY**

1.9.1. Comply with requirements of Workplace Hazardous Materials Information System (WHMIS) regarding use, handling, storage, and disposal of hazardous materials. Submit WHMIS MSDS (Material Safety Data Sheets) for products where required, and maintain one copy at site in a visible and accessible location available to personnel.

1.9.2. Comply with requirements of Occupational Health and Safety Act and other regulations pertaining to health and safety, including worker's compensation/ insurance board and fall protection regulations. When working in confined spaces, comply with requirements of Occupational Health and Safety Act - Ontario Regulation 632, "Confined Spaces" and any other applicable Ministry of Labour requirements.

1.10. **PLANNING AND LAYOUT OF WORK**

1.10.1. Base installation layout, design, terminations, and supply of accessories, on Contract Documents with specific coordination with reviewed shop drawings.

1.10.2. Plan, coordinate, and establish exact locations and routing of services with affected trades prior to installation such that services clear each other as well as other obstructions.

Generally, order of right of way for services to be as follows:

1.10.2.1. piping requiring uniform pitch;
1.10.2.2. piping 100 mm (4") dia. and larger;
1.10.2.3. large ducts (main runs);
1.10.2.4. cable tray and bus duct;
1.10.2.5. conduit 100 mm (4") dia. and larger;
1.10.2.6. piping less than 100 mm (4") dia.;
1.10.2.7. smaller branch ductwork;
1.10.2.8. conduit less than 100 mm (4") dia..

1.10.3. As reviewed with Consultant, Mechanical Contractor is to generally determine final locations of major work within ceiling spaces.

1.10.4. Unless otherwise shown or specified, conceal work in finished areas, and conceal work in partially finished and/or unfinished areas to extent made possible by the area construction. Install services as high as possible to conserve headroom and/or ceiling space. Notify Consultant where headroom or ceiling space appears to be inadequate prior to installation of work.

1.10.5. Do not use Contract Drawing measurements for prefabrication and layout of raceways, conduits, ducts, bus ducts, luminaires, and other such work. Locations and routing are to be generally in accordance with Contract Drawings, however, prepare layout drawings for such work. Use established bench marks for both horizontal and vertical measurements. Confirm inverts, coordinate with and make allowances for work of other trades. Accurately layout work, and be entirely responsible for work installed in accordance with layout drawings. Where any invert, grade, or size is at variance with Contract Drawings, notify Consultant prior to proceeding with work.

1.10.6. Prepare plan and interference drawings (at a minimum drawing scale of 1:50 or ¼"=1' 0") of work for coordination with each trade Contractor. Arrange for preparation of detailed section drawings of ceiling spaces of corridors and any other congested areas. Sections are to be cross referenced with plan drawings so that trades may make use of section drawings. Section drawings to indicate lateral and elevation dimensions of major services within ceiling space. Lateral dimensions are to be from grid lines and elevations from top of floor slab. Obtain from Consultant, engineering drawings for this use. Contractors' interference drawings are to be distributed among other Trade Contractors. Submit drawings to Consultant for review. Failure of General Contractor to prepare and coordinate overall interface drawings of trades does not relieve respective Division Contractor of responsibility to ensure that work is properly planned and coordinated.

1.10.7. Carry out alterations in arrangement of work that has been installed without proper coordination, study, and review, even if in accordance with Contract Documents, in order to conceal work behind finishes, or to allow installation of other work, without additional cost. In addition, make necessary alterations in other work required by such alterations, without additional cost.

1.10.8. Control products, products requiring maintenance, junction boxes, and similar products, particularly such products located above suspended ceilings must be located for easy access for servicing and/or removal. Products which do not meet this location requirement are to be relocated to an accessible location at no additional cost.

1.10.9. Be responsible for making necessary changes, at no additional cost, to accommodate structural and building conditions that were missed due to lack of coordination.

1.10.10. Where drawings indicate that acoustic tile ceiling is being suspended below plaster ceiling, coordinate design of framework used to support suspended ceiling, lighting, diffusers, and other Divisions components that are mounted within or through ceiling. Do not mount devices to suspended ceiling. Secure and mount to ceiling slab above. Seal ceiling openings to maintain required fire rating.

1.11. **COORDINATION OF WORK**

1.11.1. Review Contract Documents and coordinate work with work of each trade. Coordination requirements are to include, but not be limited to following:

1.11.1.1. requirements for openings, sleeves, inserts and other hardware necessary for installation of work;

1.11.1.2. concrete work such as housekeeping pads, sumps, bases, etc., required for work, and including required dimensions, operating weight of equipment, location, etc.;

1.11.1.3. depth and routing of excavation required for work, and requirements for bedding and backfill;

1.11.1.4. wiring work required for equipment and systems but not specified to be done as part of mechanical work, including termination points, wiring type and size, and any other requirements.

1.11.2. Ensure materials and equipment are delivered to site at proper time and in such assemblies and sizes so as to enter into building and be moved into spaces where they are to be located without difficulty.

1.11.3. Wherever possible, coordinate equipment deliveries with manufacturers and/or suppliers so equipment is delivered to site when it is required, or so it can be stored within building subject to available space as confirmed with Owner and reviewed with Consultant and protected from elements.

1.11.4. Ensure proper access and service clearances are maintained around equipment, and, where applicable, access space for future equipment removal or replacement is not impeded. Comply with code requirements with regards to access space provision around equipment. Remove and replace any equipment which does not meet this requirement.

1.11.5. Where work is to be integrated, or is to be installed in close proximity with work of other trades, coordinate work prior to and during installation.

1.12. **COMPONENT FINAL LOCATIONS**

1.12.1. Owner and Consultant reserve right to relocate electrical components such as receptacles, switches, communication system, outlets, hard wired outlet boxes and luminaries at a later date, but prior to installation, without additional cost to Owner, if relocation per components do not exceed 3 m (10') from original location. No credits will be anticipated where relocation per components of up to and including 3 m (10') reduces materials, products and labour. Should relocations exceed 3 m (10') from original location, adjust contract price for that portion beyond 3 m (10') in accordance with provisions for changes in Contract Documents.

1.13. **SYSTEMS COORDINATION**

1.13.1. Be responsible for and perform specific coordination of various low voltage systems supplied by Electrical Divisions and also with systems supplied by other Divisions of Work. Include for but not be limited to provision of following, as applicable:

1.13.1.1. coordinate with General Contractor and other Subcontractors, various systems of trades which in any way are interfaced with or monitored by or integrated to, or need to be coordinated with;

1.13.2. prepare systems coordination drawings detailing related system coordination and integration points being monitored and/or controlled; submit coordination drawings as part of shop drawing submission;

1.13.3. coordinate security system requirements with successful door hardware supplier and prepare detailed coordination drawings of component installations, wiring and conduit layouts, division of responsibility between various trades, etc.; review security system requirements with associated door hardware (electromagnetic locks, electric strikes, etc.), to ensure proper sequence of operation and door functionality is provided to suit each door configuration; prepare detailed door functionality of each door configuration and submit to and review with Consultant;

1.13.4. review systems requirements for component back boxes and conduits; ensure that system of conduits and boxes meet respective system wiring bending radii requirements;

1.13.5. review specifications of each trade/Division (i.e. for BAS points, elevator requirements, electrical devices in millwork or prefabricated service consoles, outlet box and back box requirements), to ensure proper power supplies, interconnecting wiring requirements and back box/ outlet box requirements;

1.13.6. review with manufacturers coordination and integration requirements of their systems;

1.13.7. review each systems communication protocols to ensure they are compatible and can communicate with each other as required;

1.13.8. review system shop drawings prior to submission to Consultant, to verify that each system has been coordinated with other systems and that required options and features are selected to meet coordination requirements;

1.13.9. be present at testing and commissioning functions of each system and provide technical assistance with regards to system operations;

1.13.10. be "on-site" coordinator of respective system trades with regards to respective system coordination of installation and testing;

1.13.11. coordinate with various trades and equipment vendors and review with Consultant with regards to ensuring that systems coordinate and integrate properly to meet intent of design and Owner requirements;

1.13.12. document coordination and integration requirements and maintain records for submission as part of shop drawings;

1.13.13. respond to coordination and integration requirements and be responsible for such work;

1.13.14. where a system integrator has been included for, coordinate integration requirements with system integrator.

1.14. **PRODUCTS**

1.14.1. Be responsible for ordering of products (equipment and materials) in a timely manner in order to meet project-scheduling timelines. Failure to order products to allow manufacturers sufficient production/delivery time to meet project-scheduling timelines is an unacceptable reason to request for other suppliers or substitutions.

1.14.2. Provide Canadian manufactured products wherever possible or required and when quality and performance is obtainable at a competitive price. Products are to be supplied from manufacturer's authorized Canadian representative, unless otherwise noted. Unless otherwise specified, products are to be new and are to comply with applicable respective Canadian standards. References to UL listings of products to include requirements that products are to be also Underwriters Laboratories of Canada (ULC) listed for use in Canada. Products are to meet or exceed latest ANSI/ASHRAE/IES 90.1 standards, as applicable. Do not supply any products containing asbestos materials or PCB materials.

1.14.3. Systems and equipment of this Project are to be "State of the Art" and be most recent and up to date series/version of product that is available at time of shop drawing review process. Products that have been stored or "on shelf" for an extended period of time will not be accepted. Software is to be of latest version available and be provided with updates available at time of shop drawing review process. Systems are to be designed such that its software is backwards compatible. Future upgrades are not to require any hardware replacements or additions to utilize latest software.

1.14.4. Products scheduled and/or specified have been selected to establish a performance and quality standard, and, in some instances, a dimensional standard. In most cases, base specified manufacturers are stated for any product specified by manufacturer's name and model number. Where acceptable manufacturers are listed, first name listed is base specified company. Bid Price may be based on products supplied by any of manufacturers' base specified or named as acceptable for particular product. If acceptable manufacturers

are not stated for a particular product, base Bid Price on product supplied by base specified manufacturer.

1.14.5. Documents have been prepared based on product available at time of Bidding. If, after award of Contract, and if successful manufacturer can no longer supply a product that meets base specifications, notify Consultant immediately. Be responsible for obtaining other manufacturers product that complies with base specified performance and criteria and meets project timelines. Proposed products are subject to review and consideration by Consultant and are considered as substitutions subject to a credit to Contract. In addition, if such products require modifications to room spaces, mechanical systems, electrical systems, etc., include required changes. Such changes are to be submitted in detail to Consultant for review and consideration for acceptance. There will be no increase in Contract Price for revisions. Above conditions supplement and are not to supersede any specification conditions in Division 01 with regards to substitutions or failure to supply product

1.14.6. Listing of a product as "acceptable" does not imply automatic acceptance by Consultant and/or Owner. It is responsibility of Contractor to ensure that any price quotations received and submittals made are for products that meet or exceed specifications included herein.

1.14.7. If products supplied by a manufacturer named as acceptable are used in lieu of base specified manufacturer, be responsible for ensuring that they are equivalent in performance and operating characteristics (including energy consumption if applicable) to base specified products. It is understood that any additional costs (i.e. for larger starters, larger feeders, additional spaces, etc.), and changes to associated or adjacent work resulting from provision of product supplied by a manufacturer other than base specified manufacturer, is included in Bid Price. In addition, in equipment spaces where equipment named as acceptable is used in lieu of base specified equipment and dimensions of such equipment differs from base specified equipment, prepare and submit for review accurately dimensioned layouts of rooms affected, identifying architectural and structural elements, systems and equipment to prove that equipment in room will fit properly meeting design intent. There will be no increase in Contract Price for revisions.

1.14.8. In addition to manufacturer’s products base specified or named as acceptable, other manufacturers of products may be proposed as substitutions to Consultant for review and consideration for acceptance, listing in each case a corresponding credit for each substitution proposed. However, base Bid Price on products base specified or named as acceptable. Certify in writing to Consultant that proposed substitution meets space, power, design, energy consumption, and other requirements of base specified or acceptable product. It is understood that there will be no increase in Contract Price by

reason of any changes to associated equipment, mechanically, electrically, structurally or architecturally, required by acceptance of proposed substitution. Consultant has sole discretion in accepting any such proposed substitution of product. Indicate any proposed substitutions in areas provided on Bid Form. Do not order such products until they are accepted in writing by Consultant.

1.14.9. Indicate in Supplementary Electrical Bid Form, names of manufacturers for proposed products to be supplied, and which were based specified or scheduled with a manufacturer's name. Names of proposed manufacturers on list must be one of names stated as acceptable for particular products, unless prior approval from Owner has been given for use of products by other manufacturers. Submit to Consultant for review as directed.

1.14.10. When requested by Consultant, identify names of manufacturers for proposed products to be supplied, and which were based specified or scheduled with a manufacturer's name. Names of proposed manufacturers on list must be one of names stated as acceptable for particular products, unless prior approval from Owner has been given for use of products by other manufacturers. Submit to Consultant for review as directed.

1.14.11. Where products are listed as "or approved equal", certify in writing that product to be used in lieu of base specified product, at least meets space, power, design, energy consumption, and other requirements of base specified product and is equivalent or better than base specified product. When requested by Consultant, provide full design detail drawings and specifications of proposed products. Acceptance of these "or approved equal" products is at sole discretion of Consultant. It is understood that there will be no increase in Contract Price by reason of any changes to associated equipment, mechanically, electrically, structurally or architecturally, required by acceptance of approved equal product. There must be no increase in Contract price due to Consultant's rejection of proposed equivalent product.

1.14.12. Whenever use of product other than base specified product is being supplied, ensure corresponding certifications and product information (detailed catalogue and engineering data, fabrication information and performance characteristics) are submitted to Consultant for review. Failure of submission of these documents to Consultant in a timely manner to allow for review will result in base specified product to be supplied at Consultant's discretion, at no additional cost to Contract.

1.14.13. Products supplied by a manufacturer/supplier other than a manufacturer listed as acceptable may be considered for acceptance by Consultant if requested in writing with full product documentation submitted, a minimum of 10 working days prior to Bid closing date.

1.14.14. Any proposed changes initiated by Contractor after award of Contract may be considered by Consultant at Consultant's discretion, with any additional costs for such changes if accepted by Owner and reviewed with Consultant, and costs for review, to be borne by Contractor.

1.14.15. Whenever use of product other than based specified products or named as acceptable is being supplied, allow sufficient time for processing of product submissions and time for Consultant's review , such that there will not be significant impact on contract time or work schedule.

1.14.16. Requirements for low voltage systems of this project that are of technology that changes rapidly and are forever evolving and changing, resulting in systems that may be out dated by time of installation, are to include provisions to allow Owner option to select most updated technology. Shop drawings for such systems and equipment are to include provisions for a minimum 6-week review time for Owner to review degree of technology of each system and determine acceptance. Owner will have right to substitute a more advanced technology subject to negotiated pricing.

1.15. **SHOP DRAWINGS**

1.15.1. At start-up meeting review with Consultant, products to be included in shop drawing submission. Prepare and submit list of products to Consultant for review.

1.15.2. Submit electronic copies of shop drawings unless otherwise directed by Owner or reviewed with Consultant. Review exact requirements with Consultant.

1.15.3. Submit for review, drawings showing in detail design, construction, and performance of equipment and materials as requested in Specification. Submit shop drawings to Consultant for review prior to ordering and delivery of product to site. Include minimally for preparation and submission of following, as applicable:

1.15.3.1. product literature cuts;
1.15.3.2. equipment data sheets;
1.15.3.3. equipment dimension drawings;
1.15.3.4. system block diagrams;
1.15.3.5. sequence of operation;
1.15.3.6. connection wiring schematic diagrams;
1.15.3.7. functionality with integrated systems.

1.15.4. Each shop drawing or product data sheet is to be properly identified with project name and product drawing or specification reference. Shop drawing or product data sheet dimensions are to match dimension type on drawings.

1.15.5. Where any item of equipment is required by Code or Standard or By-Law to meet a specific energy efficiency level, or any other specific requirement, ensure this requirement is clearly indicated on submission.

1.15.6. Ensure proposed products meet each requirement of Project. Endorse each shop drawing copy "CERTIFIED TO BE IN ACCORDANCE WITH ALL REQUIREMENTS". Include company name, submittal date, and sign each copy. Shop drawings that are received and are not endorsed, dated and signed will be returned to be resubmitted.

1.15.7. Consultant to review shop drawings and indicate review status by stamping shop drawing copies as follows:

1.15.7.1. "REVIEWED" or "REVIEWED AS NOTED" (appropriately marked) – If Consultant's review of shop drawing is final, Consultant to stamp shop drawing;

1.15.7.2. "RETURNED FOR CORRECTION" – If Consultant's review of shop drawing is not final, Consultant to stamp shop drawing as stated above, mark submission with comments, and return submission. Revise shop drawing in accordance with Consultant's notations and resubmit.

1.15.8. Following is to be read in conjunction with wording on Consultant's shop drawing review stamp applied to each and every shop drawing submitted:

"THIS REVIEW BY CONSULTANT IS FOR SOLE PURPOSE OF ASCERTAINING CONFORMANCE WITH GENERAL DESIGN CONCEPT. THIS REVIEW DOES NOT MEAN THAT CONSULTANT APPROVES DETAILED DESIGN INHERENT IN SHOP DRAWINGS, RESPONSIBILITY FOR WHICH REMAINS WITH CONTRACTOR. CONSULTANT'S REVIEW DOES NOT RELIEVE CONTRACTOR OF RESPONSIBILITY FOR ERRORS OR OMISSIONS IN SHOP DRAWINGS OR OF CONTRACTOR'S RESPONSIBILITY FOR MEETING REQUIREMENTS OF CONTRACT DOCUMENTS. BE RESPONSIBLE FOR DIMENSIONS TO BE CONFIRMED AND CORRELATED AT JOB SITE, FOR INFORMATION THAT PERTAINS SOLELY TO FABRICATION PROCESSES OR TO TECHNIQUES OF CONSTRUCTION AND INSTALLATION, AND FOR CO- ORDINATION OF WORK OF SUB-TRADES."

1.15.9. Submit each system and each major component as separate shop drawing submissions.

Submit together, shop drawings for common devices such as devices of each system.

1.15.10. Obtain shop drawings for submission from product manufacturer's authorized representatives and supplemented with additional items specified herein.

1.15.11. Do not order product until respective shop drawing review process has been properly reviewed with Consultant.

1.15.12. Where extended warranties are specified for equipment items, submit specified extended warranty with shop drawing submittal.

1.15.13. Refer to specific requirements in other Sections.

1.16. **ENGINEERED SUBMITTALS**

1.16.1. Submittals for items required to be sealed by a professional engineer (engineered) are to be duly prepared, sealed, and signed under direct control and supervision of a qualified professional engineer licensed in jurisdiction of the work. Professional engineer is to conform to requirements specified in this Section in article entitled Requirements for Contractor Retained Engineers.

1.16.2. Engineered submittals are to include, but not be limited to, following:

1.16.2.1. complete CAD layout drawings indicating equipment, wiring schematic, conduit routing and sizing, zones, devices, and any other pertinent data;
1.16.2.2. listing of design data used to determine system layout and sizing;
1.16.2.3. complete copies of design calculations and listing of design data used in preparing calculations;
1.16.2.4. list detailing standards, codes, regulations, etc. adhered to when designing system;
1.16.2.5. items as noted in other Sections of the Specification.

1.16.3. Professional engineer responsible for engineered submittals is to perform periodic field reviews, including review of associated mock-ups where applicable, at locations wherever work as described by engineered submittal is in progress, during fabrication and installation of such work, and submit a field review report after each visit. Submit field review reports to Consultant and authorities having jurisdiction as required.

1.16.4. Field reviews are to be at intervals as necessary and appropriate to progress of work described by engineered submittal to allow engineer to be familiar with progress and quality of such work and to determine if work is proceeding in general conformity with Contract Documents including reviewed shop drawings and design calculations.

1.16.5. Upon completion of work as described by engineered submittal, professional engineer responsible for preparation of engineered submittal and for performing periodic field reviews is to prepare and submit to Consultant and, if applicable, authorities having jurisdiction, a letter certifying that work has been supplied and installed in accordance with requirements of Contract Documents, authorities having jurisdiction and engineered submittal.

1.17. **EQUIPMENT LOADS**

1.17.1. Supply equipment loads (self-weight, operating weight, housekeeping pad, inertia pads, etc.) to Consultant, via shop drawing submissions, prior to construction.

1.17.2. Where given choice of specific equipment, actual weight, location and method of support of equipment may differ from those assumed by Consultant for base design. Back-check equipment loads, location, and supports, and include necessary accommodations.

1.17.3. Where supporting structure consists of structural steel framing, it is imperative that equipment loads, location, and method of support be confirmed prior to fabrication of structural steel. Review locations of equipment with Consultant prior to construction.

1.18. **OPENINGS**

1.18.1. Supply opening sizes and locations to Consultant to allow verification of their effect on design, and for inclusion on structural drawings where appropriate.

1.18.2. No openings are permitted through completed structure without written approval from Owner and review with Consultant. Show required openings on a copy of structural drawings. Identify exact locations, elevations, and size of proposed openings and submit to Consultant for review, well in advance of doing work.

1.18.3. Prior to leaving site at end of each day, walk through areas of work and check for any openings, penetrations, holes, and/or voids created under scope of work of project, and ensure that any openings created under scope of work have been closed off, fire-stopped and smoke-sealed. Unless otherwise directed by Owner and reviewed with Consultant, do not leave any openings unprotected and unfinished overnight.

1.19. **SCAFFOLDING, HOISTING, AND RIGGING,**

1.19.1. Unless otherwise specified or directed, supply, erect and operate scaffolding, rigging, hoisting equipment and associated hardware required for work, and subject to approval from Owner and review with Consultant.

1.19.2. Use scaffolds in such a manner as to interfere as little as possible with work of other trades.

1.19.3. Do not place major scaffolding/hoisting equipment loads on any portion of structure without approval from Owner and review with Consultant. No supports, clips, brackets or similar devices are to be welded, bolted or otherwise affixed to any finished member or surface without approval from Owner and review with Consultant.

1.19.4. Immediately remove from site scaffolding, rigging and hoisting equipment when no longer required.

1.20. **CHANGES IN THE WORK**

1.20.1. Whenever Consultant proposes in writing to make a change or revision to design, arrangement, quantity, or type of any work from that required by Contract Documents,

prepare and submit to Consultant for review, a quotation detailing proposed cost for executing change or revision.

1.20.2. Quotation to be a detailed and itemized estimate of product, labour, and equipment costs associated with change or revision, plus overhead and profit percentages and applicable taxes and duties.

1.20.3. If overhead and profit percentages are not specified in Division 00 or 01, but allowable under Contract as reviewed with Consultant prior to contract signing, then allowable maximum percentages for overhead and profit are to be 5% and 5% respectively.

1.20.4. Unless otherwise specified in Divisions 00 or 01, following additional requirements apply to quotations submitted:

1.20.4.1. when change or revision involves deleted work as well as additional work, cost of deleted work (less overhead and profit percentages but including taxes and duties) is to be subtracted from cost of additional work before overhead and profit percentages are applied to additional work;

1.20.4.2. material costs are not to exceed those published in local estimating price guides;

1.20.4.3. electrical material labour unit costs are to be in accordance with National Electrical Contractors Association Manual of Labor Units at difficult level, less 25%;

1.20.4.4. mechanical material labour unit costs are to be in accordance with Mechanical Contractors Association of America Labor Estimating Manual, less 25%;

1.20.4.5. costs for journeyperson and apprentice labour must not exceed prevailing rates at time of execution of Contract and must reflect actual personnel performing work;

1.20.4.6. cost for site superintendent must not exceed 10% of total hours of labour estimated for change or revision, and change or revision must be such that site superintendent's involvement is necessary.

1.20.4.7. costs for rental tools and/or equipment are not to exceed local rental costs;

1.20.4.8. overhead percentage will be deemed to cover quotation costs other than actual site labour and materials, and rentals;

1.20.4.9. quotations, including those for deleted work, to include a figure for any required change to Contract time.

1.20.5. Quotations submitted that are not in accordance with requirements specified above will be rejected and returned for re-submittal. Failure to submit a proper quotation to enable Consultant to expeditiously process quotation and issue a Change Order will not be grounds for any additional change to Contract time.

1.20.6. Make requests for changes or revisions to work in writing to Consultant and, if accepted by Owner, Notice of Change to be issued.

1.20.7. Do not execute any change or revision until written authorization for change or revision has been obtained from Owner and reviewed with Consultant.

1.21. **NOTICE FOR REQUIRED FIELD REVIEWS**

1.21.1. Whenever there is a requirement for Consultant to perform a field review prior to concealment of any work, to inspect/re-inspect work for deficiencies prior to Substantial Performance of the Work, for commissioning demonstrations, and any other such field review, give minimum 5 working days' notice in writing to Consultant.

1.21.2. If Consultant is unable to attend a field review when requested, arrange an alternative date and time.

1.21.3. Do not conceal work until Consultant advises that it may be concealed.

1.21.4. When Consultant is requested to perform a field review and work is not ready to be reviewed, reimburse Consultant for time and travel expenses.

1.22. **PRELIMINARY TESTING**

1.22.1. When directed by Consultant, promptly arrange, pay for, and perform site tests on any piece of equipment or any system for such reasonable lengths of time and at such times as may be required to prove compliance with Specification and governing Codes and Regulations, prior to Substantial Performance of the Work.

1.22.2. When, in Consultant's opinion, tests are required to be performed by a certified testing laboratory, arrange and pay for such tests.

1.22.3. These tests are not to be construed as evidence of acceptance of work, and it is agreed and understood that no claim for delays or damage will be made for injury or breakage to any part or parts of equipment or system due to test where such injuries or breakage were caused by faulty parts and/or workmanship of any kind.

1.22.4. When, in Consultant's opinion, tests indicate that equipment, products, etc., are defective or deficient, immediately remove such equipment and/or products from site and replace them with acceptable equipment and/or products, at no additional cost.

1.23. **PROVISIONS FOR SYSTEMS/EQUIPMENT USED DURING CONSTRUCTION**

1.23.1. Any system or piece of equipment that is specified to be provided under requirements of Documents and is required to be used during construction stages of work prior to issuing of Certificate of Substantial Performance of the Work, are to be provided with special interim maintenance and service to cover systems/equipment during time of use during construction period of project until project has been certified as substantially performed and such systems/equipment are turned over to Owner.

1.23.2. During this period of construction, such systems/equipment to not become property of Owner or be Owner's responsibility for maintenance or service. Systems/equipment are to remain property of respective manufacturers/suppliers or Contractor, who are responsible for full maintenance and servicing of systems/equipment in order to maintain validity of warranties after turn over to Owner.

1.23.3. Prior to application for a Certificate of Substantial Performance of the Work and turn over to Owner, such systems/equipment to be cleaned, restored to "new" condition, paint finishes "touched-up", filters cleaned or replaced, etc.

1.24. **TEMPORARY SERVICES**

1.24.1. Coordinate with Prime Contractor, requirements for temporary services including but not limited to temporary electrical power, lighting, heating and exit pathways. Locations of exit pathways to be as decided at discretion of Prime Contractor and to be illuminated complete with emergency lighting, and provided with exit signage and fire alarm devices. Unless otherwise noted, provide required services in accordance with requirements of local governing building code and local governing inspection authorities.

1.24.2. Maintain fire protection of areas which may include fire watch during temporary shutdowns of existing systems, in accordance with requirements of local governing code and local governing authorities.

1.25. **CLEANING**

1.25.1. During construction, keep site reasonably clear of rubbish and waste material resulting from work on a daily basis to the satisfaction of Owner and Consultant. Before applying for a Certificate of Substantial Performance of the Work, remove rubbish and debris, and be responsible for repair of any damage caused as a result of work.

1.25.2. At time of final cleaning, clean luminaire reflectors, lenses, and other luminary surfaces that have been exposed to construction dust and dirt, including top surface, whether it is exposed or in ceiling space.

1.25.3. Clean switches, receptacles, communications outlets, coverplates, and exposed surfaces.

1.25.4. Clean other electrical equipment and devices installed as part of this project.

1.25.5. For work performed in electrical equipment rooms, electrical closets and communication closets, perform following:

1.25.5.1. HEPA vacuum and clean interiors and buswork of switchboards, panels, cabinets and other electrical equipment of construction debris and dust prior to energization;

1.25.5.2. HEPA vacuum top of switchboards, panels, cabinets, bus ducts, cable trays and conduits in room, followed by a thorough HEPA vacuuming of floors;

1.25.5.3. do not lay permanent switchboard matting in electrical rooms until rooms are re-cleaned, and floors wet mopped and dried just prior to final turn over to Owner.

1.26. **RECORD AS-BUILT DRAWINGS**

1.26.1. Drawings for this project have been prepared on a CAD system using AutoCAD software of release version reviewed with Consultant.

1.26.2. As work progresses at site, clearly mark in red in a neat and legible manner on a set of bound white prints of Contract Drawings, changes and deviations from routing of services and locations of equipment shown on Contract Drawings, on a daily basis. Changes and deviations include those made by addenda, change orders, and site instructions. Use notes marked in red as required. Maintain white print red line as-built set at site for exclusive use of recording as-built conditions, keep set up-to-date, and ensure set is available for periodic review. As-built set is also to include following:

1.26.2.1. dimensioned location of inaccessible concealed work;

1.26.2.2. locations of control devices with identification for each;

1.26.2.3. location and identification of devices in concealed locations such as accessible ceiling spaces and raised floors;

1.26.2.4. for underground piping and ducts, record dimensions, invert elevations, offsets, fittings, cathodic protection and accessories if applicable, and locate dimensions from benchmarks to be preserved after construction is complete;

1.26.2.5. location of concealed services terminated for future extension and work concealed within building in inaccessible locations.

1.26.2.6. location of fire alarm devices and include addresses of devices; identify fire alarm zones;

1.26.2.7. identify routing and location of concealed conduits/ducts of diameter 50 mm (2") and greater;

1.26.3. Before applying for a Certificate of Substantial Performance of the Work, update a clean copy of Contract Drawing set in accordance with marked up set of "as-built" white prints including deviations from original Contract Drawings, thus forming an "as-built" drawing set. Submit "as-built" site drawing prints to Consultant for review. Make necessary revisions to drawings as per Consultant’s comments, to satisfaction of Consultant.

1.26.4. Upon completion of work, electrical contractor shall provide these (3) sets of white prints to reflect 'as-built' conditions. 'as-built' drawings shall incorporate any changes or deviations from the tender documents.

1.26.5. Contractor shall also provide electronic files in AutoCAD format in a cd disk to reflect 'as-built' conditions.

1.26.6. Contractor to mark the drawings as 'as-built' along with electrical contractors company name.

1.27. **OPERATING AND MAINTENANCE MANUALS**

1.27.1. For each item of equipment for which a shop drawing is required (except for simple equipment), supply minimum 3, project specific, indexed copies of equipment manufacturers' operating and maintenance (O&M) instruction data manuals. Review exact quantity of manuals with Consultant. Consolidate each copy of data in an identified hard cover three "D" ring binder. Each binder to include:

1.27.1.1. front cover: project name label; wording – "Electrical Systems Operating and Maintenance Manual"; and date;

1.27.1.2. introduction sheet listing Consultant, Contractor, and Subcontractor names, street addresses, telephone and fax numbers, and e-mail addresses;

1.27.1.3. equipment manufacturer's authorized contact person name, telephone number and company website;

1.27.1.4. Table of Contents sheet, and corresponding index tab sheets;

1.27.1.5. copy of each "REVIEWED" or clean, updated "REVIEWED AS NOTED" shop drawing or product data sheet, with manufacturer's/supplier's name, telephone and fax numbers, email address, company website address, and email address for local source of parts and service; when shop drawings are returned marked "REVIEWED AS NOTED" with revisions marked on shop drawing copies, they are to be revised by equipment supplier to incorporate comments marked on "reviewed" shop drawings and a clean updated copy is to be included in operating and maintenance manuals;

1.27.1.6. maintenance data as follows:

1.27.1.6.1. operation and trouble-shooting instructions for each item of equipment and each system;

1.27.1.6.2. schedules of tasks, frequency, tools required, and estimated task time;

1.27.1.6.3. recommended maintenance practices and precautions including warnings of any maintenance practice that will damage or disfigure equipment/systems;

1.27.1.6.4. complete parts lists with numbers.

1.27.1.7. performance data as follows:

1.27.1.7.1. equipment and system start-up data sheets;

1.27.1.7.2. equipment test reports;

1.27.1.7.3. final verification and commissioning reports.

1.27.1.8. explanation of operating principles and sequences;

1.27.1.9. inspection certificates issued by regulatory authorities;

1.27.1.10. wiring and connection diagrams;
1.27.1.11. copies of additional and revised panelboard directories;
1.27.1.12. warranties;
1.27.1.13. items requested specifically in Section Articles.

1.27.2. Generally, binders are not to exceed 75 mm (3") thick and not to be more than 2/3 full.

1.27.3. Operating and maintenance instructions are to relate to job specific equipment supplied under this project and related to Owner's building. Language used in manuals is to contain simple practical operating terms and language easy for in-house maintenance staff to understand how to operate and maintain each system.

1.27.4. Before applying for a Certificate of Substantial Performance of the Work, assemble one draft copy of O & M Manual and submit to Consultant for review prior to assembling remaining copies. Incorporate Consultant's comments into final submission.

1.27.5. Provide 2 digital copies of contents of operating and maintenance manuals and load onto separate USB type flash drives and submit to Consultant. Prepare digital copies using version of Adobe Acrobat Portable Document Format or equal as reviewed with Consultant and enhanced with bookmarks and internal document links.

1.28. **WARRANTY**

1.28.1. Unless otherwise specified in Divisions 00 and 01, warrant work to be in accordance with Contract Documents and free from defects for a period of 1 year from date of issue of a Certificate of Substantial Performance of the Work.

1.28.2. Where equipment includes extended warranty period, e.g., 5 years, first year of warranty period is to be governed by terms and conditions of warranty in Contract Documents, and remaining years of warranty are to be direct from equipment manufacturer and/or supplier to Owner. Submit signed and dated copies of extended warranties to Consultant.

1.28.3. Warranty to include parts, labour, travel costs and living expenses incurred by manufacturer's authorized technician to provide factory authorized on-site service.

1.28.4. Repair and/or replace any defects that appear in Work within warranty period without additional expense to Owner. Be responsible for costs incurred in making defective work good, including repair or replacement of building finishes, other materials, and damage to other equipment. Ordinary wear and tear and damage caused wilfully or due to carelessness of Owner's staff or agents is exempted.

1.28.5. Do not include Owner deductible amounts in warranties.

1.28.6. It is understood that warranties are to commence from time of Substantial Performance of the Work, regardless of what is noted within following Sections of Specification. Be

responsible for providing whatever "bridging" or additional extended warranty period is required from time that material is purchased until this time.

1.28.7. Visit building during warranty period with Owner representatives. Owner to organize these visits. At these meetings, Owner representatives are to review performance of systems. If performance is satisfactory, then no further action needs to be taken. If unsatisfactory, then correct deficiencies, as directed by Owner representatives, to satisfaction of Owner representatives. These site visits to occur:

1.28.7.1. once during first month of building operation;
1.28.7.2. once during third month of building operation;
1.28.7.3. once between fourth and tenth month in a season opposite to first and third month visits.

1.29. **PROJECT CLOSE OUT SUBMITTALS**

1.29.1. Prior to application for Substantial Performance of the Work, submit required items and documentation specified, including following:

1.29.1.1. Operating and Maintenance Manuals;
1.29.1.2. as-built record drawings and associated data;
1.29.1.3. extended warranties for equipment as specified;
1.29.1.4. operating test certificates;
1.29.1.5. identified keys for equipment and/or panels for which keys are required, and other items required to be submitted;
1.29.1.6. other data or products specified.
1.29.1.7. ESA inspection report and final certificate
1.29.1.8. Stamped approved shop drawings
1.29.1.9. Fire alarm verification report where it is applicable

1.30. **FINAL INSPECTION**

1.30.1. Submit to Consultant, written request for final inspection of systems. Include written certification that:

1.30.1.1. deficiencies noted during job inspections have been completed;
1.30.1.2. field quality control procedures have been completed;
1.30.1.3. maintenance and operating data have been completed and submitted to, reviewed with Consultant and accepted by Owner;
1.30.1.4. tags and nameplates are in place and equipment identifications have been completed;
1.30.1.5. clean-up is complete;
1.30.1.6. spare parts and replacement parts specified have been provided and acknowledged by Consultant;

1.30.1.7. as-built and record drawings have been completed and submitted to and reviewed with Consultant and accepted by Owner;

1.30.1.8. Owner's staff has been instructed in operation and maintenance of systems;

1.30.1.9. commissioning procedures have been completed;

1.30.1.10. fire alarm verification has been 100% completed and Verification Certificate has been submitted to and accepted by Consultant.

Table of Contents

PART 1 - GENERAL

1.1. **REFERENCE**

1.1.1. Division 00 and Division 01 apply to and are a part of each Electrical Division Section.

1.2. **APPLICATION**

1.2.1. This Section specifies products, criteria and characteristics, and methods and execution that are common to one or more Sections of Electrical Divisions. It is intended as a supplement to each Section of Electrical Divisions and is to be read accordingly.

1.3. **SUBMITTALS**

1.3.1. Submit shop drawings for products of this Section.

1.3.2. Additionally, as part of shop drawing submission process, submit following to Consultant for review:

1.3.2.1. sample of each proposed type of access door if supplied under Work of this Division, as well as electronic copies of reflected ceiling plan drawings and wall elevation drawings showing proposed access door locations;
1.3.2.2. dimensioned location drawings indicating required sleeves and formed openings in structural poured concrete or precast concrete construction or in roofing, and locations of cutting or drilling required for Electrical Divisions Work;
1.3.2.3. samples of materials and any other items as specified in succeeding Sections of Electrical Divisions;
1.3.2.4. weight loads of selected equipment (upon request);
1.3.2.5. equipment nameplate and warning sign proposed nomenclature, print type, symbols, sizing and colours;
1.3.2.6. fire stopping installation drawings with ULC certifications;
1.3.2.7. copies of prior to start of construction approvals from local governing authorities having jurisdiction.

1.3.3. Prior to application for Substantial Performance of the Work, submit following to Consultant for review (note: funds will be withheld until each of following items have been completed and documented to satisfaction of Consultant):

1.3.3.1. fire alarm system testing and verification report of each component of Work; devices to be certified working and in proper order;
1.3.3.2. final distribution system testing and arc flash study performed and documented to satisfaction of Consultant;
1.3.3.3. structured network cabling system tested and verified to be operating and performing in accordance with specified standards.

1.4. **CONTINUITY OF SUPPLY FOR STANDARDIZATION**

1.4.1. Utilize materials of one manufacturer for aspects of Work, where practical. Utilize one common manufacturer for wiring devices, such as switches and receptacles, whether installed loose or in a pre-manufactured component. Coordinate with each supplier and ensure conformance with this requirement. Identify deviations to Consultant and obtain approval of change prior to proceeding with Work.

1.5. **ADDITIONAL WORK ITEMS**

1.5.1. Following description of Work includes labour, material, payroll burden, small tools, overhead, profit, and specific tax. Amounts for Work are to include applicable programming, testing, and verification. Harmonized Sales Tax (HST) is not included in amount, but is to be identified separately. Work described below is included in Bid Price:

1.5.1.1. provision of 5 ceiling mounted smoke detectors;
1.5.1.2. provision of 5 wall mounted fire alarm horns, each with 15 m (50') of conduit and wire;
1.5.1.3. provision of 5 wall mounted fire alarm horn/strobes, each with 15 m (50') of conduit and wire;
1.5.1.4. provision of 10 exit lights.

PART 2 - PRODUCTS

2.1. **CONDUITS**

2.1.1. EMT (Thin wall), galvanized electrical metallic tubing to CSA C22.2 No. 83, complete with factory made bends where site bending is not possible and joints and terminations made with steel couplers and steel set screw type connectors with insulated throats, and concrete tight where required.

2.1.2. Rigid galvanized steel to CSA C22.2 No. 45, with exterior zinc and interior enamel coatings, galvanized threads where factory cut and red lead coated threads where site cut. Factory made bends where site bending is not possible, factory made and threaded fittings, and connectors, and terminations with rigid couplings, and concrete tight where required.

2.1.3. Galvanized steel flexible liquid tight metallic conduit to CSA C22.2 No. 56, complete with Ideal "Steel Tough" liquid-tight flexible conduit connectors at terminations.

2.1.4. Galvanized steel flexible metallic conduit to CSA C22.2 No. 56, complete with proper and suitable squeeze type connectors at terminations.

2.1.5. CSA approved and labelled, FT-4 rated, rigid plastic (PVC) conduit complete with site made heat gun bends on conduit to 50 mm (2") diameter, factory made elbows in conduit larger

than 50 mm (2") diameter, solvent weld joints, factory made expansion joints where required, and terminations made with proper and suitable connectors and adaptors.

2.1.6. Medium density CSA certified polyethylene flexible plastic conduit in a continuous coil of proper length.

2.2. **OUTLET BOXES**

2.2.1. CSA approved stamped galvanized steel outlet boxes.

2.2.2. Crouse-Hinds Canada Ltd., CSA certified, "FS" or "FD" Series cast Feraloy and aluminium outlet boxes.

2.2.3. Standard general-purpose Service floor boxes: CSA approved, UL scrub water compliant, fully adjustable angular and vertically, formed steel/cast iron, round single gang / rectangular or square multi-gang as required, flush in concrete floor installation, boxes complete with conduit knockout openings, adjustable collars, hinged flip open brass covers with provisions for mounting of duplex power receptacles, telephone jacks and data jacks. Provide barriered boxes when boxes contain both power and communication outlets and different voltage levels. Size boxes to suit thickness of floor slab as confirmed with Consultant and to suit required bending radii of conductors. Refer to drawings for number of gang requirements. Acceptable manufacturers are Hubbell, Legrand and Thomas & Betts. Special floor boxes are specified elsewhere in another Section.

2.2.4. Each outlet box and back box to be suitable in respects for application and complete with suitable securing lugs, connectors suitable for connected conduit, knockouts and, where necessary, suitable plaster rings, concrete rings, covers, carpet flanges and any other required accessory.

2.2.5. Electrical boxes exposed exterior of building or in non-climate controlled locations to be weatherproof boxes complete with gasketed covers/faceplates.

2.3. **PULLBOXES AND JUNCTION BOXES**

2.3.1. Galvanized or prime coat plated steel, suitable in respects for application and complete with screw-on or hinged covers as required, and connectors suitable for connected conduit.

2.3.2. Cooper Crouse-Hinds, "Condulet", threaded cast Feraloy outlet boxes of an exact type to suit application, each complete with screw-on gasketed cover.

2.3.3. Rigid plastic (PVC), CSA certified, junction boxes and access fittings with solvent weld type joints and screw-on PVC covers.

2.3.4. Physical size of pull boxes to be as required by local governing electrical code to suit number and size of conduits and conductors.

2.3.5. Each box to be suitable in respects for application and complete with suitable securing lugs, connectors suitable for connected conduit, knockouts and, where necessary, suitable plaster rings, concrete rings, covers and any other required accessory.

2.3.6. Boxes exposed exterior of building or in non-climate controlled locations to be weatherproof boxes complete with gasketed covers.

2.4. **CONDUCTORS**

2.4.1. All wires and cables to be CSA approved, ULC listed and certified and be suitable for applications as per the latest Ontario electrical safety code (OESC).

2.4.2. Provide long barrel double crimp, 2 hole compression type lug connectors for all conductors sized 3/0 and higher.

2.4.3. standard type for communication and control applications is no. 18 AWG "tew" rated for 600V.

2.4.4. For fire alarm and security conductors use the approved type by AHJ, building code and electrical code.

2.4.5. Conductors not installed in conduit or raceways to be fire insulated rated in accordance with latest governing code flame spread requirements.

2.4.6. Minimum wiring size to be no. 12 AWG for system over 24V.

2.4.7. Always use manufacturer recommended conductor type and size for mechanical and electrical equipment wiring.

2.4.8. Use RWU90 for underground applications and for non-climate controlled spaces.

2.4.9. Using AC90 flexible armoured cable as branch circuit is only permitted in accessible ceiling spaces and within stud wall construction inside a climate controlled area for luminaires and system furniture connections (maximum length 3m).

2.4.10. Use RW90 or T90 nylon for all other climate-controlled spaces not noted above.

2.4.11. Armoured cables must be run in a neat manner parallel to the building lines and supported in intervals as permitted by OESC.

2.4.12. Install conductors inside conduit unless otherwise noted.

2.4.13. Maximum voltage drop shall be 3%. Size wires to suit.

2.4.14. Use VFD rated wires for VFD output circuits unless otherwise noted.

2.5. **PANELBOARDS**

2.5.1. Panelboard ratings (voltage, amperage, single/three phase) shall be as specified on drawings and CSA approved.

2.5.2. Acceptable manufacturer: Square D, Eaton, Siemens.

2.5.3. Main bus to be copper.

2.5.4. Panelboard front door to be lockable.

2.5.5. Provide updated, typewritten directory card in a transparent card holder mounted on the panel door.

2.5.6. Verify all dimensions and workspace requirement prior to panelboard procurement.

2.5.7. Use NEMA 3R rated panelboard for outdoor applications.

2.5.8. Panelboards located indoor and in spaces protected by sprinkler system shall be equipped with non-combustible hoods or shields to minimize interference with the sprinkler system.

2.5.9. Provide filler plates for all unused spaces.

2.5.10. Spare circuit breakers to be installed and identified clearly in panelboard directory.

2.5.11. Provide 2x27mm EMT conduit from panelboard enclosure to above ceiling or under raised floor space for future use. Cap conduits ends.

2.5.12. Ensure that all panelboards are provided with the best balance of current between phases. Submit a report to the owner if requested.

2.5.13. Load to be distributed evenly between phases.

2.6. **CIRCUIT BREAKERS**

2.6.1. All circuit breakers to be bolt-on molded case, quick-make, quick-break type unless otherwise noted.

2.6.2. All circuit breakers to be CSA/ULC listed.

2.6.3. Common-trip breakers: with single handle for multi-pole applications.

2.6.4. Magnetic instantaneous trip elements in circuit breakers to operate only when value of current reaches setting. Trip settings on breakers with adjustable trips to range from 5 - 10 times current rating.

2.6.5. Lock-on devices for security systems, fire alarm, intercom & night light circuits.

2.6.6. Provide adjustable magnetic trip setting to be provided for circuit breakers with frame sizes 250A and larger.

2.6.7. Lugs to suitable for number, size, trip ratings and conductor material.

2.6.8. Circuit breakers interrupting capacity to comply with available fault current. For minor modifications that co-ordination and short circuit study is not available use breakers with not less interrupting capacity of the existing circuit breakers.

2.7. **FUSES**

2.7.1. Service entrance & over 600A: class l, time delay.

2.7.2. 600A or less feeders with no motor loads & heavy inrush currents: class 'J' or 'RK1', fast acting.

2.7.3. 600A or less feeders with motor loads & heavy inrush currents: class 'Rk5', dual-element, time delay.

2.7.4. Other branch circuits: class Rk5.

2.7.5. Control circuits: class CC, time delay.

2.7.6. All pedestrian post top light fixtures, parking lot light fixtures, and roadway light fixtures shall be individually fused. Provide bussmann FNQ 10 Amp, time delay fuse, in little fuse LEB AB series (rated for #10 AWG line side and #10 AWG load side) single-pole breakaway in-line fuse holder. Fuse holder shall be located in the pole's handhole. No exceptions.

2.7.7. Acceptable manufacturers: Cooper Bussmann, Littlefuse.

2.8. **DISCONNECTING MEANS & STARTERS**

2.8.1. Acceptable manufacturers: Square D, Siemens, Eaton.

2.8.2. Use heavy duty disconnect switches, single throw, horsepower rated, with clips or bolt pads to accommodate specified fuses, lockable handle with capability to accept three padlocks, and interlocked with covet in closed position.

2.8.3. Class r fuse kit: provides rejection of other fuse types when class r fuses are specified.

2.8.4. Lugs: suitable for number, size, and conductor material.

2.8.5. Service-rated switches: labeled for use as Service equipment.

2.8.6. Starters shall be magnetic and designed for full voltage starting and stopping of ac motors.

2.8.7. Provide motor overload protection and two auxiliary contacts for all new starters.

2.8.8. Provide hand-off-auto selector switch and on/off led indication lights.

2.8.9. All starters enclosure to be NEMA size unless otherwise noted.

2.9. **SLEEVES**

2.9.1. Galvanized steel sleeves as follows:

2.9.1.1. Schedule 40 pipe;

2.9.2. Schedule 40 PVC sleeves.

2.10. **FIRESTOPPING AND SMOKE SEAL MATERIALS**

2.10.1. Asbestos-free, elastomeric materials and intumescent materials, tested, listed and labelled by ULC in accordance with CAN/ULC S115, and CAN/ULC S101 for installation in ULC designated firestopping, and smoke seal systems to provide a positive fire, water and smoke seal and a fire resistance rating (flame, hose stream and temperature) no less than fire rating for surrounding construction.

2.10.2. Firestopping and smoke seal material system to be specifically ULC certified with designated reference number for its specific installation. As part of shop drawing submission, submit copies of firestopping drawings with ULC certificate and system number for each specific installation.

2.10.3. Smoke and fire seal materials and manufacturers must be specifically approved for each application of penetrated surfaces, as approved by FM Global and listed in FM Global Approval Guide. Listed companies herein and other manufacturers are only acceptable if compliant with these requirements. As part of shop drawing submission, submit copies of firestopping drawings with FM Global Approval Guide.

2.10.4. Materials are to be compatible with abutting dissimilar materials and finishes and complete with primers, damming and back-up materials, supports, and anchoring devices in accordance with firestopping manufacturer's recommendations and ULC tested assembly. Coordinate material requirements with trades supplying abutting areas of materials.

2.10.5. Submit schedule of opening locations and sizes, penetrating items, and required listed design numbers to seal openings to maintain fire resistance ratings.

2.10.6. Typically, for openings of up to 250 mm (10") in diameter, provide putty pad type firestop materials equivalent to Specified Technologies Inc. "SpecSeal" intumescent, non-hardening, water resistant putties containing no solvents, inorganic fibres or silicone compounds.

2.10.7. Typically, for openings of greater than 250 mm (10") in diameter, and for rectangular openings, provide pillow type firestop materials equivalent to Specified Technologies Inc. "SpecSeal" re-enterable, non-curing, mineral fibre core encapsulated on six sides with intumescent coating contained in a flame retardant poly bag.

2.10.8. For applications where fire rated firestopping cable pathway system is to be special structurally reinforced, reusable and require no or minimal alterations to firestop component when cables are either added or removed, provide Specified Technologies Inc. "EZ-PATH" device modules comprised of steel raceway with intumescent foam pads allowing 0 to 100 percent cable fill. Structure to be sturdy enough to stand up to constant modification and use, but maintain its ULC firestopping rating.

2.10.9. Supply products of a single manufacturer for use on Work of this Division.

2.10.10. Installer to be manufacturer trained and certified on specific Product. Submit copy of certificate with shop drawings.

2.10.11. Include for manufacturer’s authorized representative to inspect and verify each installation and application. Submit test report signed and verified by system installer’s authorized representative and manufacturer’s representative.

2.10.12. Acceptable certification to also include certification by Underwriters Laboratories of Northbrook IL, using tests conforming to ULC-S115 and given cUL listing published by UL in their "Products Certified for Canada (cUL) Directory".

2.10.13. Acceptable manufacturers are:

2.10.13.1. Specified Technologies Inc.;
2.10.13.2. 3M Canada Inc.;
2.10.13.3. Tremco;
2.10.13.4. A/D Fire Protection Systems;
2.10.13.5. Nelson;
2.10.13.6. Hilti Canada.

2.11. **FASTENING AND SECURING HARDWARE**

2.11.1. Concrete inserts - Crane Canada Ltd., No. 4-M for concrete Work for single or double conduit, cable tray, etc., runs and equipment. Unistrut Ltd. multiple type inserts for runs of three (3) or more conduits etc., or where a grid support system is required.

2.11.2. Concrete fasteners – "WEJ-IT" anchors, lead cinch anchors and/or "STAR" or "PHILLIPS" self-drilling anchors.

2.11.3. Masonry inserts – "WEJ-IT" expansion shields and machine bolts or, for light loads, fibre or lead plugs and screws.

2.11.4. Drywall or plaster wall and/or ceiling fasteners – 2-wing spring toggles.

2.11.5. Structural steel - Crane Canada Ltd., beam clamps.

2.11.6. Metal framing channels – typical 40 mm (1-5/8") width but increased where required to suit application, galvanized steel channels complete with required fittings and ancillary hardware. Acceptable manufacturers of framing channels are:

2.11.6.1. Unistrut;
2.11.6.2. Thomas & Betts;
2.11.6.3. Hilti;
2.11.6.4. Eaton B-Line.

2.11.7. Acceptable manufacturers of fastening and securing hardware:

2.11.7.1. Crane;
2.11.7.2. Hilti;
2.11.7.3. Thomas & Betts.

2.11.8. Metal "J" hooks or Panduit "J-Pro" cable support systems for communications system cabling in accessible ceiling spaces were conduit or cable tray is not being provided. Use of J-hooks is subject to approval from Owner and review with Consultant.

2.11.9. Velcro tie wraps for bundling and securing cables.

2.12. **ACCESS DOORS**

2.12.1. Coordinate consistency of look and finish of access doors on project with each Division of Work. Coordinate exact requirements with General Trades Contractor.

2.12.2. Access doors to be rust resistant steel door panels, with concealed hinges and positive locking and self-opening screwdriver operated lock. Wall type frame to be suitable for wall installation and have integral keys for plaster walls. Doors in tile wall to be stainless steel and in ceilings to be suitable for plaster covering with only frame joint showing. All other doors to be prime painted steel.

2.12.3. Size access door to suit the concealed Work for which they are supplied, and wherever possible they are to be of standard size for all applications, but in any case, they are to be minimum 300 mm x 300 mm (12" x 12") for hand entry and 600 mm x 600 mm (24" x 24") for body entry.

2.12.4. Lay-in type tiles, properly marked, may serve as access panels. Coordinate marking of ceiling tiles with Consultant. Panels in glazed tile walls to be 12 gauge, 304 alloy stainless steel, No. 4 finish, with recessed frame secured with stainless steel counter-sunk flush head screws.

2.12.5. Panels in plaster surfaces to have dish-shaped door and welded metal lath, ready to take plaster. Provide a plastic grommet for door key access.

2.12.6. Other access doors to be welded 12 gauge steel, flush type with concealed hinges, lock and anchor straps, complete with factory prime coat. Submit to Consultant for review, details of non-standard door construction details.

2.12.7. Access doors in fire rated ceilings, walls, partitions, structures, etc., to be ULC listed and labelled and of a rating to maintain fire separation integrity.

2.12.8. Where access doors are located in surfaces where special finishes are required, they are to be of a recessed door type capable of accepting finish in which they are to be installed so as to maintain final building surface appearance throughout.

2.12.9. Acceptable manufacturers include Le Hage, SMS, Pedlar and Acudor.

2.13. **IDENTIFICATION NAMEPLATES**

2.13.1. Laminated plastic (Lamacoid) black-white-black with bevelled edges, stainless steel screws, and proper identification engraving. Each nameplate to be sized to suit equipment for which it is provided, and required wording. Confirm nomenclature with Consultant.

2.13.2. Various colour configurations to be used to differentiate systems. Confirm exact colour scheme with Consultant and/or Owner.

2.13.3. Brother "P-Touch", portable electronic labelling system complete with self-adhesive, permanent printed labels with required nomenclature.

2.14. **WARNING SIGNS**

2.14.1. .1 Thomas & Betts Ltd., semi-rigid vinyl panels with drilled holes in each corner, stainless steel screws, pressure sensitive mounting pads on back, and required printed wording. Generally, wording to be red on a white background with black trim confirmed with Consultant.

2.15. **SYSTEM BACKBOARDS**

2.15.1. .1 FSC (Forest Stewardship Council), G1S (good one side) construction grade fir plywood, containing no added urea formaldehyde, flame retardant prime coat painted on exposed surfaces, minimum 20 mm (3/4") thick, as sized on drawings and with flame spread rating in accordance with local governing building code requirements.

2.16. **MOTOR STARTER PANELS**

2.16.1. Minimum No. 14 gauge sheet steel panels complete with steel angle reinforcing, framing and suitable splitter trough, fully primed and enamel painted, sized to accommodate starters required with spare space and capacity for at least two additional units.

2.17. **SPRINKLER PROTECTION**

2.17.1. Provide drip shields for protection of surface mounted equipment enclosures from water spray and dripping of liquids. Features of shields include:

2.17.1.1. factory constructed by respective equipment manufacturers;
2.17.1.2. constructed from non-combustible materials (sheet steel);
2.17.1.3. enamel painted to match equipment;
2.17.1.4. surfaces and edges filled/sanded smooth prior to painting;
2.17.1.5. supported from equipment with structural steel rods/metal framing or other method reviewed with Consultant;
2.17.1.6. structural support finish painted to match shield.

2.17.2. Include with equipment shop drawings, detailed dimensions of drip shields and methods of supporting.

2.17.3. Equipment with top cable/conduit entries to include additional sealing of entries with gasketing and/or waterproof sealant to prevent water from entering enclosure.

2.17.4. Design ventilation louvers such that live components are not exposed to water spray and dripping liquids.

2.17.5. Above requirements are additional minimum "sprinkler protection" standards for equipment specified as NEMA (EEMAC) 1, 2 or 12.

2.17.6. Obtain CSA approval where required by local governing authorities.

PART 3 - EXECUTION

3.1. **GENERAL CONDUIT INSTALLATION REQUIREMENTS**

3.1.1. Install conduit concealed in finished areas, and concealed to degree made possible by finishes in partially finished and unfinished areas. Conduit may be exposed in unfinished areas such as Electrical and Mechanical Rooms, unless otherwise noted on drawings or specified herein. Refer to and examine architectural drawings and room finish schedules to determine finished, partially finished or unfinished areas of building. Documents do not identify exact routing. Where shown, routing is diagrammatic, identifying general requirements of routing and locations. Include for necessary offsets, fittings, transformations and similar items required because of obstructions and other architectural or structural details not shown.

3.1.2. Where conduits are exposed, arrange them to avoid interference with other Work, parallel to building lines and install as high as possible. Do not install conduits within 150 mm (6") of "hot" pipes or equipment unless conduits are associated with equipment. Independently run conduit to be supported from wall/ceiling structure, not from ceiling hangers, ductwork, piping, cable trays, formed steel decking, etc. Do not run conduits within 900 mm (3') of equipment access opening covers.

3.1.3. Where conduit is proposed to be embedded within structural concrete, obtain Owner's approval and review with Consultant (Structural Engineer). Install such conduit in compliance with requirements of latest edition of CSA Standard CAN3-A23.1, "Concrete Materials, and Methods of Concrete Construction". Confirm and review with Structural Consultant, proper installation practices and methods. In areas where Consultant has directed conduit not to be embedded in concrete, run conduits through beams via sleeved openings pre-coordinated and reviewed with General Contractor and by Consultant (Structural Engineer). Do not embed conduit runs in concrete slab of parking garage areas, unless approved by Owner and reviewed with Consultant.

3.1.4. So as not to impair required strength of structure, following criteria to be generally followed but which is to be reviewed and coordinated with Consultant prior to start of Work:

3.1.4.1. where conduits pass by a column, stay at least two times thickness of slab and drop away from column;

3.1.4.2. where conduits terminate adjacent to a column or wall, bring conduit in toward column/wall as close to 90° to face of column as possible within two times thickness of slab and drop away from column;

3.1.4.3. maximum size of conduit in structural slabs is 1/5 of solid portion of slab thickness;

3.1.4.4. where more than two conduits are adjacent to each other, they are to be spaced greater of 3 diameters or 100 mm (4") apart;

3.1.4.5. total of depth of conduits crossing over each other is to be less than one-third thickness of slab;

3.1.4.6. place conduit in middle third of thickness of slab; do not lay conduit directly on reinforcing steel;

3.1.4.7. do not run conduit adjacent to parallel reinforcing bars;

3.1.4.8. do not run conduit longitudinally in beam without approval of Owner and review with Consultant; pass through beams at right angles to span of beam;

3.1.4.9. where conduits pass through beams, maintain at least twice depth of beam separation away from supports;

3.1.4.10. do not run conduits in slab beside a drop or beam within twice depth of slab from edge of drop or beam;

3.1.4.11. do not run conduits through shear walls or columns without approval of Owner and review with Consultant;

3.1.4.12. do not place conduit in structural elements in parking garage structures, water retaining structures or structures subjected to de-icing chemicals, without approval of Owner and review with Consultant.

3.1.5. For proposed use of conduit runs underground below slab include following provisions:

3.1.5.1. concrete encased duct bank with conduits of non-ferrous materials and sloped to drain properly into pit;

3.1.5.2. proper drain pit;

3.1.5.3. system to be a pull-in system;

3.1.5.4. 20% spare conduits (with minimum of at least 1);

3.1.5.5. system proposal to consider and address any effects of magnetic fields.

3.1.5.6. For isolation rooms, seal conduits that penetrate through walls, floor, or ceilings with suitable elastomeric and intumescent materials around penetrating item and within any openings of item to ensure complete isolation of rooms. Such sealing materials are to be suitable for specific applications and maintain fire rating of penetrated surface and not be of a hazardous material. Submit shop drawings of proposed materials.

3.1.5.7. Conduits are sized on drawings, but in absence of type and sizing, type and size to suit intended application in accordance with applicable local governing electrical code requirements. Sizes identified on drawings are minimum sizes and are not to be decreased unless approved by Owner and reviewed with Consultant.

3.1.5.8. Where receptacle type devices are located in existing floors and/or where feeds are required to furniture systems in open spaces, and where chasing of floor slab to run conduit is not acceptable to Owner after review with Consultant provide fire rated "poke- thru" assembly installed through floor and feed from conduit runs provided in ceiling space of floor below.

3.2. **INSTALLATION OF CONDUIT**

3.2.1. Provide conduit for conductors except armoured cable and copper sheathed mineral insulated conductors, and except where duct or similar raceway materials are provided.

3.2.2. All wiring shall be installed in metal conduits or raceways unless otherwise noted.

3.2.3. Conduit size shall not be less than 27mm for telecom cables and 21mm for other applications.

3.2.4. Provide nylon fish wire c/w proper labeling for all empty conduits.

3.2.5. Provide compress type of conduit coupling and connectors, set-screw type is not acceptable unless otherwise noted.

3.2.6. All conduits shall have bushings at their ends where they are terminated to enclosures, boxes and panels.

3.2.7. All exposed conduits not located inside Service rooms shall be painted to match background color.

3.2.8. Provide conduit as follows:

3.2.8.1. for exposed conduit outside building, for semi-exterior areas such as loading areas and within parking garage floor areas – rigid galvanized steel (rigid PVC where permitted by local codes and Owner and reviewed with Consultant);

3.2.8.2. for exposed conduit in non-climate controlled areas, in areas of corrosive elements – epoxy coated ridged galvanized steel;

3.2.8.3. for branch circuit conductors underground inside building, and underground outside building beneath concrete, asphalt, and similar paving material-rigid PVC;

3.2.8.4. for branch circuit conductors underground outside building clear of concrete, asphalt and similar paving material-flexible polyethylene plastic conduit;

3.2.8.5. for exposed conduit mounted at a height of less than 1200 mm (4') in electrical, mechanical or other Service areas – rigid galvanized steel;

3.2.8.6. for short branch circuit connectors to motorized equipment and distribution transformers (minimum length 450 mm (18"), maximum length 600 mm (24") with 180° loop where possible) – galvanized steel flexible liquid-tight conduit;

3.2.8.7. for branch circuit conductors associated with isolated power systems and located in a concealed space in a wall or in a concrete floor slab-rigid PVC with separate insulated ground conductor;

3.2.8.8. at points, where conductors cross building expansion joints – galvanized steel flexible conduit with no less than 600 mm (24") of extra curve;

3.2.8.9. for branch circuit conductors in poured concrete slab – rigid PVC;

3.2.8.10. for interior conduit above 50 mm (2") diameter containing distribution conductors or communication systems conductors (fire alarm, telephone etc.) (except as noted above) – EMT with separate insulated ground conductor;

3.2.8.11. for conductors except as noted above or elsewhere in this Specification – EMT.

3.2.9. Run rigid conductors in rigid type conduits suitable for application. Do not use flexible conduit.

3.2.10. Secure conduit located in poured concrete Work in place in a manner such that conduit will not float or move when concrete is poured. Adequately protect such conduit from damage prior to and during concrete pour, and from concrete and water penetration.

3.2.11. Review with Consultant prior to Start of Work, maximum allowable size of conduit for installation in poured concrete. Placement of reinforcing steel in structural concrete Work

will take precedence over placement of conduit. Spaced adequately multiple runs of conduit in poured concrete Work, as reviewed with Consultant.

3.2.12. Install flexible polyethylene conduit in continuous lengths wherever possible and "snake" conduit in trench. Where joints are necessary, make same with nylon inserts and stainless-steel gear type clamps. Terminate with rigid conduit threadless connectors.

3.2.13. Grade bed to provide proper drainage of conduits.

3.2.14. Support underground conduit on a well-tamped flat bed of earth, free from rocks or protrusions of any kind. Grade and slope bed to provide conduits and ducts with proper drainage. Coordinate with General Trades Contractor for provision of means to carry away drainage water. Obtain required approvals of Work from local governing electrical utility and review with Consultant prior to back filling and covering. Provide pull cord in each duct run.

3.2.15. Provide manufactured expansion joints in rigid PVC plastic conduit at spacing as recommended by conduit manufacturer.

3.2.16. Provide a separate ground conductor in plastic conduits.

3.2.17. Support and secure surface mounted and suspended single or double runs of metal conduit at support spacing in accordance with local governing electrical code requirements by means of galvanized pipe straps, conduit clips, ringbolt type hangers, or by other proper manufactured devices.

3.2.18. Support multiple mixed size metal conduit runs with Unistrut Ltd., Electrovert Ltd. "CANTRUSS" or Burndy Ltd. "FLEXIBLE" conduit racks spaced to suit spacing requirements of smallest conduit in group.

3.2.19. Unless otherwise noted, provide conduit fittings constructed of same materials as conduit and which are suitable in respects for application.

3.2.20. Provide proper adaptors for joining conduits of different materials.

3.2.21. Cut square and properly ream site cut conduit ends.

3.2.22. Provide conduit as sized on drawings. Size conduit not sized on drawings in accordance with latest edition of local governing electrical code with consideration that sizes of branch circuit conductors indicated are minimum sizes and must be increased as required to suit length of run and voltage drop in accordance with voltage drop schedule found on drawings or at end of this section. Where conductor sizes are increased to suit voltage drop requirements, increase scheduled or specified conduit size to suit. Unless otherwise noted on drawings or required by local governing electrical code or specified elsewhere,

conduit to be of minimum size 13 mm (1/2") diameter. Structured network cabling system conduit to be of minimum 19 mm (3/4") diameter, unless otherwise noted.

3.2.23. Site made bends for conduit to maintain full conduit diameter with no kinking, and conduit finishes are not flake or crack when conduit is bent.

3.2.24. Plug ends of roughed-in conduits which are exposed during construction with approved plugs.

3.2.25. Ensure that conduit systems which are left empty for future wiring are clean, clear, capped and properly identified at each termination point. Provide end bushing and suitable fish wires in such conduits.

3.2.26. Provide empty conduits to ceiling spaces from flush mounted panel boards located below and/or near hung ceiling. Refer to drawing detail.

3.3. **EXPANSION FACILITIES FOR CONDUIT CROSSING BUILDING EXPANSION JOINTS**

3.3.1. Wherever concealed or surface mounted conduits cross building expansion joints, provide expansion facilities to permit free movement without imposing additional stress or loading upon support system, and to prevent excessive movement at joints and connections, in accordance with drawing details and local governing inspection approvals.

3.4. **INSTALLATION OF OUTLET BOXES AND BACK BOXES**

3.4.1. Provide an outlet box or back box for each luminaire, wiring device, telephone outlet, fire alarm system component, communications systems components, and each other such outlet.

3.4.2. Size boxes to accommodate exact supplied components and for bending radii of installed cables. Confirm requirements with respective system vendors.

3.4.3. Outlet boxes flush mounted in interior construction, surface mounted in concealed interior locations, and surface mounted in exposed interior locations where connecting conduit is EMT, to be stamped and galvanized steel outlet boxes unless otherwise noted.

3.4.4. Provide sealing around boxes in walls where insulation and vapour barrier is present or for walls of rooms that are sealed. Maintain sealing system of wall.

3.4.5. Outlet boxes in underground plastic conduit systems to be rigid PVC plastic outlet boxes, unless otherwise noted.

3.4.6. Outlet boxes for flush floor mounted devices to be concrete tight formed galvanized steel fully adjustable flush floor boxes. Locate in to position and install in accordance with manufacturer’s instructions. Coordinate installation with trades pouring concrete floor slab or trade responsible for floor construction.

3.4.7. Provide barriered outlet box for switches connected to normal and emergency power and share a common faceplate.

3.4.8. Provide outlet boxes for special wiring devices, for special equipment and special applications. Refer to requirements specified in other Sections and/or on drawings.

3.4.9. Size and arrangement of outlet boxes to suit device which they serve.

3.4.10. Mounting heights and locations for outlet boxes are typically indicated on drawings, however confirm exact location and arrangement of outlets prior to roughing-in.

3.4.11. Architectural drawings and Consultant's instructions have precedence over electrical drawing diagrammatic layouts and specified mounting heights and locations.

3.4.12. Do not install outlet or back boxes "back-to-back" in walls and partitions. Stagger such outlets and seal against noise transmission in accordance with drawing details. "Thru-wall" type boxes will not be permitted for any application.

3.4.13. Provide blank cover plates over boxes left empty for future installation of devices. Clearly identify each box as to its intended use, to Owner's approval and reviewed with Consultant. Generally, provide stainless steel type blank cover plates.

3.5. INSTALLATION OF PULLBOXES AND JUNCTION BOXES

3.5.1. Provide pullboxes in conduit systems wherever shown on drawings, and/or wherever necessary to facilitate conductor installations. Generally, conduit runs exceeding 30 m (100") in length, or with more than two - 90° bends, are to be equipped with a pullbox installed at a convenient and suitable intermediate accessible location.

3.5.2. Size boxes to accommodate exact supplied system and for bending radii of installed cables. Confirm requirements with respective system vendors.

3.5.3. Provide junction boxes wherever required and/or indicated on drawings and as required by local governing electrical code.

3.5.4. Provide sealing around boxes in walls where insulation and vapour barrier is present or for walls of rooms that are sealed. Maintain sealing system of wall.

3.5.5. Boxes in rigid conduit and EMT inside building to be stamped galvanized or prime coated steel.

3.5.6. Boxes in exterior rigid conduit and boxes in perimeter wall where insulation and vapour barrier is present, to be "Condulet" cast gasketed boxes, unless otherwise noted.

3.5.7. Boxes in plastic conduit to be rigid PVC plastic boxes complete with required couplings.

3.5.8. Pullboxes and junction boxes to be accessible after Work is completed.

3.5.9. Accurately locate and identify concealed pullboxes and junction boxes on "As-built" record drawings.

3.5.10. Clearly identify main pull or junction boxes (excluding obvious outlet boxes) by painting outside of covers. Spray painting is not permitted unless approved by Owner and reviewed with Consultant. Paint colours to be in accordance with following schedule:

3.5.10.1. lighting-yellow;
3.5.10.2. normal power-blue;
3.5.10.3. essential power-orange;
3.5.10.4. fire alarm-red;
3.5.10.5. telephone-green;
3.5.10.6. miscellaneous signals-brown.

3.5.11. In addition to painting miscellaneous signal boxes, clearly identify specific system in which box is installed.

3.5.12. Cover boxes in fire walls with aluminium tape and seal with caulking.

3.6. **INSTALLATION OF SLEEVES**

3.6.1. Where conduits, round ducts and conductors pass through structural poured concrete, provide sleeves of type suitable for application, and approved by local governing codes.

3.6.2. Sleeves in concrete slabs, except as noted below, are to be No. 24 gauge or equivalent, with an integral flange to secure sleeves for formwork construction.

3.6.3. Sleeves in waterproof concrete slabs and in other slabs where waterproof sleeves are required are to be lengths of Schedule 40 pipe sized to extend 100 mm (4'') above floor.

3.6.4. Sleeves in poured concrete walls and foundation are to be Schedule 40 pipe.

3.6.5. Size sleeves, unless otherwise noted, to leave 13 mm (1/2") clearance around conduit, duct, conductor, etc. Void between sleeves and conduit, duct, conductors, etc., to be packed and sealed for length of sleeves as in accordance with article entitled "Firestopping and Smoke Seal Materials" specified here in this Section. Ensure that sleeves set in exterior walls are packed and sealed with governing authority approved materials suitable for application and that both ends of sleeves are packed watertight with approved permanently flexible and water tight materials. Exact responsibility of Work to be coordinated with General Trades Contractor.

3.6.6. Submit to concrete reinforcement detailer at proper time, drawings indicating required sleeves, recesses and formed openings in poured concrete Work. Completely and

accurately dimension such drawings and relate sleeves, recesses and formed openings to suitable grid lines and elevation datum.

3.6.7. Supply sleeves of a water protecting type in accordance with detail found on drawings for installation in following locations:

3.6.7.1. in Mechanical and Fan Room floor slabs, except where on grade;
3.6.7.2. in slabs over Mechanical, Fan, Electrical and Telephone Equipment Rooms or closets;
3.6.7.3. in floors equipped with waterproof membranes.

3.6.8. "Gang" type sleeving to be permitted only with approval of Owner and reviewed with Consultant.

3.6.9. Terminate sleeves for Work which is exposed, so that sleeve is flush at both ends with wall, partition, or slab surface such that sleeve may be covered completely by escutcheon plates.

3.7. INSTALLATION OF FIRESTOPPING AND SMOKE SEAL MATERIALS

3.7.1. Where Work penetrates or punctures fire rated construction, provide ULC certified, listed and labelled firestopping and smoke sealing packing material systems to seal openings and voids around and within raceway and to ensure that continuity and integrity of fire separation is maintained. Openings not in immediate vicinity of working areas are to be firestopped and sealed same day as being opened.

3.7.2. Install firestopping and smoke seal materials for each installation in strict accordance with specific ULC certification number and manufacturer’s instructions. Comply with local governing building code requirements and obtain approvals from local building inspection department. Ensure that openings through fire separations do not exceed maximum size wall opening, and maximum and minimum dimensions indicated in ULC Guide No. 40 U19 for Service Penetration Assemblies and firestopping materials.

3.7.3. Ensure that continuity and integrity of fire separation is maintained and conform to requirements of latest edition of ULC publication "List of Equipment and Materials, Volume II, Building Construction".

3.7.4. Comply with following requirements:

3.7.4.1. Examine substrates, openings, voids, adjoining construction and conditions under which firestop and smoke seal system is to be installed. Confirm compatibility of surfaces.
3.7.4.2. Verify penetrating items are securely fixed and properly located with proper space allowance between penetrations and surfaces of openings.

3.7.4.3. Report any unsuitable or unsatisfactory conditions to Consultant in writing, prior to commencement of Work. Commencement of Work will mean acceptance of conditions and surfaces.

3.7.4.4. Mask where necessary to avoid spillage and over coating onto adjoining surfaces.

3.7.5. Remove stains on adjacent surfaces.

3.7.5.1. Prime substrates in accordance with Product manufacturer's written instructions.

3.7.5.2. Provide temporary forming as required and remove only after materials have gained sufficient strength and after initial curing.

3.7.5.3. Tool or trowel exposed surfaces to a neat, smooth, and consistent finish.

3.7.5.4. Remove excess compound promptly as Work progresses and upon completion.

3.7.6. Notify Consultant when Work is complete and ready for inspection, and prior to concealing or enclosing firestopping and smoke seal materials and Service penetration assemblies. Arrange for final inspection of Work by local governing authority inspector prior to concealing or enclosing Work. Make any corrections required.

3.7.7. On completion of firestopping and smoke sealing installation, submit a Letter of Assurance to Consultant certifying the firestopping and smoke sealing installation has been carried out throughout the building to Service penetrations and that installation has been performed in strict accordance with requirements of local governing building code, any applicable local municipal codes, ULC requirements, and manufacturer's instructions.

3.7.8. Manufacturer's authorized representative to inspect and verify each installation and provide a test report signed by installing trade and manufacturer's representative. Test report to list each installation and respective ULC certification and number.

3.8. **SUPPLY OF ACCESS DOORS**

3.8.1. Supply access doors to give access to junction boxes, pull boxes, conductor joints and other similar electrical Work which may need maintenance or repair but which is concealed in inaccessible construction.

3.8.2. Before commencing installation of Work, coordinate with other trades and prepare on a set of reflected ceiling plans and wall elevations, complete layouts of access doors. Submit these layouts for Consultant's review and show exact sizes and locations of such access doors. Locate and arrange electrical Work to suit.

3.8.3. Access doors to be installed by trade responsible for particular type of construction in which doors are required. Supply access doors to trade installing same at proper time.

3.8.4. Wherever possible, access doors to be of a standard size for each application. Confirm exact dimensions and minimum size restrictions with Consultant prior to ordering.

3.8.5. Coordinate with Mechanical Contractor and General Trades Contractor to ensure that access doors on project are provided by a single manufacturer, installed as part of Work of General Trades Contractor and that Work involving both mechanical and electrical services should where possible be accessible from common access door. Coordinate Work to ensure that common location access doors are not supplied by both Mechanical Divisions and Electrical Divisions.

3.9. **INSTALLATION OF FASTENING AND SECURING HARDWARE**

3.9.1. Provide fasteners and similar hardware required for conduit, duct, raceway, conductors, etc. and for equipment hanger and/or support material unless otherwise noted.

3.9.2. Accurately and properly set concrete inserts in concrete framework. Where multiple type inserts are used, space same to suit requirements of smallest conduit, etc., in group.

3.9.3. Fasten hanger and support provisions to masonry with expansion shields and machine bolts, or, for light loads, use plugs, and screws.

3.9.4. In drywall or plaster walls and/or ceilings use two wing toggles and for heavy loads, provide steel anchor plates with two or more toggles to spread load.

3.9.5. Provide beam clamps for attaching hanging and/or support provisions to structural steel, or where approved by Owner and reviewed with Consultant, weld hanging and support provisions to structural steel.

3.9.6. Explosive powder actuated fasteners are not permitted unless specific approval for their use and type has been obtained from Owner and reviewed with Consultant.

3.9.7. Under no circumstances use ceiling suspension hangers or grids for suspension of conduit and conductors. Install supports to permanent structure of building, limited to areas that will not damage structural stability.

3.9.8. Provide "J" hooks in accessible ceiling spaces where conduit is not provided for structured cabling runs or other telecommunication cabling, as approved by Owner and reviewed with Consultant.

3.9.9. Comply with J-hook manufacturer’s loading limitations and spacing criteria. Do not exceed

3.9.9.1. 1.2 m (4') spacing interval. Add additional J-hooks if cabling sags, at discretion of Consultant. Drill anchors for J-hooks into slab not into post tensioned beams. Do not install more than one system on each J-hook.

3.9.10. Install Velcro tie wraps on bundled telecommunication cables and do not over tighten.

3.9.10.1. Provide FT6/CMP rated wraps in plenum type spaces as per local building code requirements.

3.9.11. Comply with Consultant's (Structural Engineer's) limitations for maximum penetrations of securing hardware into concrete slabs.

3.10. **INSTALLATION OF IDENTIFICATION NAMEPLATES**

3.10.1. For each piece of electrical distribution equipment from electrical source of supply up to and including panelboards, for special control panels and cabinets, and for each other piece of electrical equipment, provide engraved Lamacoid identification nameplates secured to apparatus with stainless steel screws. Nameplates to indicate source of electrical supply and include Consultant's equipment identification number

3.10.2. Equip large multiple cell or component apparatus such as switchboards and distribution panels with main nameplates identifying equipment, voltage characteristics, capacity and source of supply, and with sub-nameplates clearly identifying each cell or component and its Service.

3.10.3. Panelboard nameplates to identify panelboard number as designated on drawings, unless otherwise instructed. Nameplates for disconnect switches, control panels, and cabinets to outline their Service and source of supply.

3.10.4. In areas where equipment having removable doors that can be commonly installed on different equipment, ensure that each door is identified to which piece of equipment it is associated with, such that nameplates are with correct equipment.

3.10.5. Nameplates to be mechanically secured lamacoid and be colour coded as follows:

3.10.5.1. .1 Normal Power Black with white letters.

3.10.6. Above identification nameplate and nomenclature requirements are for typical requirements for pricing only.

3.10.7. In pull boxes, junction boxes and at terminations, identify feeders by use of plastic plates indicating system voltage and circuit designations. Plates to be 25 mm (1") in diameter and have letter stamped 9 mm (5/8") high. Colour coding to be:

3.10.7.1. Phase A – red;
3.10.7.2. Phase B – black;
3.10.7.3. Phase C – blue;
3.10.7.4. Neutral – white;
3.10.7.5. Ground - green.

3.10.8. Confirm print size type and size, colours, sizing and nomenclature of nameplates with Consultant prior to ordering. Submit sample board.

3.11. **INSTALLATION OF TERMINAL BACKBOARDS**

3.11.1. Provide specified terminal backboards for communication systems and electrical distribution equipment.

3.11.2. Securely wall mount each backboard with proper fasteners to suit wall construction.

3.11.3. Unless otherwise noted, size backboards to sufficiently provide adequate terminal space for each system, plus 20% space for future additions.

3.12. **INSTALLATION OF WARNING SIGNS**

3.12.1. Provide warning signs as applicable for following:

3.12.1.1. on doors into transformer vaults;
3.12.1.2. on doors into high voltage switchgear rooms;
3.12.1.3. on doors to genset room;
3.12.1.4. on doors into main electrical rooms;
3.12.1.5. for other applications as noted.

3.12.2. Secure signs to equipment with stainless steel screws. Number of signs required and sign wording, symbols, and colours to be approved by Owner and reviewed with Consultant, and local electrical utility, where applicable.

3.13. **INSTALLATION OF ROOFTOP SUPPORT SYSTEM**

3.13.1. Install rooftop support system for conduits/raceways in accordance with manufacturer's instructions and recommendations to suit type of raceway and roofing materials.

3.13.2. If gravel top roof, remove gravel from around and under pipe support. Coordinate Work with building roofing vendor confirmed with Owner and reviewed with Consultant.

3.13.3. Consult existing roofing vendor for roof membrane compression capacities and roof loading limitations. Comply with restrictions.

3.13.4. Use properly sized clamps to suit conduit sizes. Ensure that installation and use of system does not invalidate existing roof warranties.

3.13.5. Engage existing roofing vendor to inspect installation and verify that installation has not damaged roof.

3.14. **BRANCH CIRCUIT BALANCING**

3.14.1. Connect branch lighting and power circuits to panelboards so as to balance actual loads (wattage) within 5%. If required, transpose branch circuits when Work is complete to meet this requirement.

3.14.2. At request of Consultant, perform necessary tests to show compliance with above requirement. Make such tests after building is occupied.

3.15. **EQUIPMENT BASES AND SUPPORTS**

3.15.1. Provide equipment bases, supports and concrete housekeeping pads for mounting of floor standing equipment and luminaire pole bases.

3.15.2. Secure floor mounted equipment in place on 100 mm (4") high concrete housekeeping pads, 100 mm (4") wider and longer than equipment base dimensions. Chamfer edges of bases. Include for seismic restrains as required by local governing building code.

3.15.3. Supply dimensioned drawings, templates, and anchor bolts for proper setting of equipment on bases and pads. Be responsible for required levelling, alignment, and grouting of equipment.

3.15.4. Submit to Consultant for review, dimensioned shop drawings of structurally designed concrete pads or bases for support of large, heavy equipment. Indicate on shop drawings total weight of pad or base, reinforcement, and equipment for which it is required.

3.15.5. Unless otherwise noted, support equipment suspended above floor level with suitable welded or bolted prime coat painted structural steel angles or channels bracketed to wall or secured by hanger rods.

3.16. **CONCRETE WORK**

3.16.1. Provide concrete required for Work, including formwork and reinforcing steel.

3.16.2. Unless otherwise noted in Division 03, concrete to be minimum 20700 kPa (3000 psi) ready mix concrete provided in accordance with latest editions of CAN/CSA-A23.1 "Concrete Materials and Methods of Concrete Construction" and CAN/CSA-A23.2 "Methods of Tests for Concrete".

3.16.3. Perform Work to standards and general requirements of Division 03.

3.16.4. Comply with local governing authority and local standard practices in providing concrete to compensate for local frost level of Place of Work.

3.17. **EXCAVATION AND BACKFILL**

3.17.1. Unless otherwise noted, excavation and backfill Work required for electrical Work is to be done as part of Work of Division 02 or 31, except for final hand grading Work and

backfill to 450 mm (18") above Service which is to be done as part of electrical Work. Mark out location and routing of excavation required for Work as well as required depth. Ensure that bedding is graded to provide proper drainage for ducts as reviewed with Consultant.

3.17.2. Inverts and locations of existing site services may have been site surveyed and approximate location may be shown on drawings. Confirm that local utilities have performed locates and marking out. Ensure inverts and locations are correct, prior to commencement of Work. Where discrepancies are found, immediately inform Consultant, and await direction.

3.17.3. Ensure that Work is inspected by Consultant before covering and backfilling. Failure to do so prior to backfilling will require re-excavating Work and re-backfill at no additional cost to Owner.

3.18. **FINISH PAINTING OF ELECTRICAL WORK**

3.18.1. Unless otherwise noted, finish painting of exposed Electrical Divisions Work is to be performed as part of Work of Division 09.

3.18.2. Provide identification painting for electrical distribution equipment in accordance with application requirements of Division 09. Review exact finish colours with Consultant. Equipment requiring special colour identification painting to include but not be limited to following:

3.18.2.1. communication system conduit;
3.18.2.2. genset exhaust piping.

3.18.3. Spray painting is not permitted unless approved in writing by Owner and reviewed with Consultant.

3.19. **CONDUIT PROVISIONS FOR MISCELLANEOUS SYSTEMS**

3.19.1. Provide following components to accommodate future installation of various miscellaneous systems by system installers who are to provide equipment and wiring:

3.19.1.1. conduit - diameters as sized on drawings with non-metallic fish wires or pull cords and suitable bushings for conduit terminations, and as specified in Part 2; provide labelling at each end to clearly identify each conduit run with respect to system and path;
3.19.1.2. outlet boxes - standard galvanized steel, each complete with a blank type faceplate, and as specified in Part 2;
3.19.1.3. pull boxes, junction boxes, back boxes and sleeves - and as specified in Part 2.

3.19.2. Miscellaneous systems are typically as shown on drawings. Unless otherwise noted on drawings, provide dedicated conduit runs for each system. Coordinate sizes of boxes with

respective system vendors to ensure proper sizing to accommodate components and that allows for wiring bending radii. Confirm conduit and box requirements also with system vendors.

3.19.3. Provide pullboxes in conduit runs longer than 30 m (100') or having more than two -

90 bends. Size pullboxes to be at least 8 times entering conduit in length. Pullbox sizes to comply with respective system standards.

3.19.4. Leave conduits free and clear of all obstructions and terminate as required. Equip terminations with bushing, and clearly identify each run. Provide fish wires in all empty conduits. Run telecommunications conduits to comply with separation from sources of electromagnetic radiation as per standard ANSI/TIA/EIA-569. Site bend telecommunications conduit elbows to comply with system conduit bending radii requirements.

3.19.5. Review exact requirements and locations of equipment with Consultant and respective system installers prior to roughing-in.

3.19.6. Refer to system riser diagrams on drawings.

3.19.7. Quantities for outlets to be as per floor plan drawings and not riser diagrams.

3.20. **GROUNDING & BONDING**

3.20.1. Provide required grounding and bonding Work in accordance with drawings, local governing electrical authority, governing authorities having jurisdiction and local governing electrical inspection authority. Provide local governing electrical utility's grounding requirements for stations, vaults and electrical rooms, as applicable. Confirm requirements with local governing electrical utility.

3.20.2. Ground and bond other equipment such as transformers, switchboards, panelboards, and similar metal Work to perimeter ground bus. Provide minimum no. 3/0 insulated ground wire from ground bus in electrical rooms to switchboards, transformers, structure, floor, etc.

3.20.3. Extend conductors to metal piping of main water Service and connect ground conductor to street side of water meter. If piping is not metallic, make necessary connections as required by local governing electrical utility.

3.20.4. Effectively bond metallic pipe services such as, gas mains, water mains, and dry risers, to main grounding terminal at their point of entry. Make connections to services with purpose-made grounding clamps.

Table of Contents

PART 1 - GENERAL

1.1. **RELATED SECTIONS**

1.1.1. Section 26 05 00 - Common Work Results - Electrical.

1.2. **REFERENCES**

1.2.1. Canadian Standards Association, (CSA)

1.2.2. Insulated Cable Engineers Association, Inc. (ICEA)

PART 2 - PRODUCTS

2.1. **CABLE PROTECTION**

2.1.1. 38 x 140 mm planks pressure treated with copper napthenate or 5% pentachlorophenol solution, water repellent preservative.

2.2. **MARKERS**

2.2.1. Concrete type cable markers: 600 x 600 x 100 mm with words: cable, joint or conduit impressed in top surface, with arrows to indicate change in direction of cable and duct runs.

2.2.2. Wooden post type markers: 89 x 89 mm, 1.5 m long, pressure treated with copper napthenate or 5% pentachlorophenol solution, water repellent preservative, with nameplate fastened near post top, on side facing cable or conduit to indicate depth and direction of duct and cable runs.

2.2.3. Nameplate: aluminum anodized 89 x 125 mm, 1.5 mm thick mounted on cedar post with mylar label 0.125 mm thick with words Cable, Joint or Conduit with arrows to indicate change in direction.

2.3. **DUCT FOR CONCRETE ENCACSEMENT**

2.3.1. CSA approved, PVC Type II plastic or FRE Composites Inc., "FRE" fibreglass reinforced epoxy conduit suitable for concrete encasement and in accordance with local Utility requirements.

2.3.2. Synthetic polypropylene fibre (plastic) twine cord or 19 mm (3/4") diameter polyethylene rope, approved by local governing Utility.

PART 3 - EXECUTION

3.1. **DIRECT BURIAL OF CABLES**

3.1.1. After sand bed, lay cables maintaining 75 mm clearance from each side of trench to nearest cable. Do not pull cable into trench.

3.1.2. Provide offsets for thermal action and minor earth movements. Offset cables 150 mm for each 60 m run, maintaining minimum cable separation and bending radius requirements.

3.1.3. Make termination and splice only as indicated leaving 0.6 m of surplus cable in each direction.

3.1.4. Make splices and terminations in accordance with manufacturer's instructions using approved splicing kits.

3.1.5. Underground cable splices not acceptable.

3.1.6. Minimum permitted radius at cable bends for rubber, plastic or lead covered cables, 8 times diameter of cable; for metallic armoured cables, 12 times diameter of cables or in accordance with manufacturer's instructions.

3.1.7. Cable separation:

3.1.7.1. Maintain 75 mm minimum separation between cables of different circuits.
3.1.7.2. Maintain 300 mm horizontal separation between low and high voltage cables.
3.1.7.3. When low voltage cables cross high voltage cables maintain 300 mm vertical separation with low voltage cables in upper position.
3.1.7.4. At crossover, maintain 75 mm minimum vertical separation between low voltage cables and 150 mm between high voltage cables.
3.1.7.5. Maintain 300 mm minimum lateral and vertical separation for fire alarm and control cables when crossing other cables, with fire alarm and control cables in upper position.
3.1.7.6. Install treated planks on lower cables 0.6 m in each direction at crossings.

3.1.8. After sand protective cover specified in Section 31 23 33.01 - Excavating, Trenching and Backfilling, is in place, install continuous row of overlapping 38 x 140 mm pressure treated planks as indicated to cover length of run.

3.2. **CABLE INSTALLATION IN DUCTS**

3.2.1. Provide ducts and concrete encasement shown and as required, in accordance with applicable local governing authority codes and standards. Coordinate Work with trades responsible for performing excavation, backfill, and concrete Work. Confirm requirements with local authority having jurisdiction.

3.2.2. Install cables as indicated in ducts.

3.2.2.1. Do not pull spliced cables inside ducts.

3.2.3. Install multiple cables in duct simultaneously.

3.2.4. Use CSA approved lubricants of type compatible with cable jacket to reduce pulling tension.

3.2.5. To facilitate matching of colour coded multiconductor control cables reel off in same direction during installation.

3.2.6. Before pulling cable into ducts and until cables are properly terminated, seal ends of lead covered cables with wiping solder; seal ends of non-leaded cables with moisture seal tape.

3.2.7. After installation of cables, seal duct ends with duct sealing compound.

3.3. **MARKERS**

3.3.1. Mark cable every 150 m along cable runs and changes in direction.

3.3.2. Mark underground splices.

3.3.3. Where markers are removed to permit installation of additional cables, reinstall existing markers.

3.3.4. Install wooden post type markers.

3.3.5. Lay concrete markers flat and centred over cable with top flush with finish grade.

3.4. **FIELD QUALITY CONTROL**

3.4.1. Perform tests in accordance with Section 26 05 00 - Common Work

3.4.2. Perform tests using qualified personnel. Provide necessary instruments and equipment.

3.4.3. Check phase rotation and identify each phase conductor of each feeder.

3.4.4. Check each feeder for continuity, short circuits, and grounds. Ensure resistance to ground of circuits is not less than 50 megohms.

3.4.5. Pre-acceptance tests.

3.4.5.1. After installing cable but before splicing and terminating, perform insulation resistance test with 1000 V megger on each phase conductor.

3.4.5.2. Check insulation resistance after each splice and/or termination to ensure that cable system is ready for acceptance testing.

3.4.6. Acceptance Tests

3.4.6.1. Ensure that terminations and accessory equipment are disconnected.

3.4.6.2. Ground shields, ground wires, metallic armour and conductors not under test.

3.4.6.3. High Potential (Hipot) Testing.

3.4.6.3.1. Conduct hipot testing at 100 % of original factory test voltage in accordance with manufacturer's recommendations.

3.4.6.4. Leakage Current Testing.

3.4.6.4.1. Raise voltage in steps from zero to maximum values as specified by manufacturer for type of cable being tested.

3.4.6.4.2. Hold maximum voltage for specified time period by manufacturer.

3.4.6.4.3. Record leakage current at each step.

3.4.7. Provide Owner’s Representative with list of test results showing location at which each test was made, circuit tested and result of each test. Include results in Commissioning Manual.

3.4.8. Remove and replace entire length of cable if cable fails to meet any of test criteria.

Table of Contents

PART 1 - GENERAL

1.1. **Scope**

1.1.1. The Contractor shall furnish and install the panelboards as specified and as shown on the contract drawings.

1.2. **References**

1.2.1. The panelboards and all components shall be designed, manufactured and tested in accordance with the latest applicable standards of NEMA and CSA as follows:

1.2.2. C22.2 No. 29 – Panelboards

1.2.3. C22.2 No. 94– Cabinets and boxes

1.2.4. NEMA PB1

1.2.5. C22.2 No. 4 – Fusible Switches

1.3. **Submittals – for Review/approval**

1.3.1. The following information shall be submitted to the Engineer:

1.3.2. Breaker layout drawing with dimensions indicated and nameplate designation

1.3.3. Component list

1.3.4. Conduit entry/exit locations

1.3.5. Assembly ratings including:

1.3.6. Short-circuit rating

1.3.7. Voltage

1.3.8. Continuous current

1.3.9. Cable terminal sizes

1.3.10. Product data sheets

1.4. **Submittals – for construction**

1.4.1. The following information shall be submitted for record purposes:

1.4.2. Final as-built drawings and information for items listed in Paragraph 1.04, and shall incorporate all changes made during the manufacturing process

1.4.3. Installation information

1.4.4. Seismic certification and equipment anchorage details as specified

1.5. **Qualifications**

1.5.1. The manufacturer of the assembly shall be the manufacturer of the major components within the assembly.

1.5.2. The manufacturer of this equipment shall have produced similar electrical equipment for a minimum period of five (5) years. When requested by the Engineer, an acceptable list of installations with similar equipment shall be provided demonstrating compliance with this requirement.

1.6. **Regulatory Requirements**

1.6.1. Panelboard overcurrent protective devices shall be selectively coordinated with all supply side overcurrent protective devices as required for this project by the CEC.

1.6.2. The panelboards shall be CSA labeled.

1.7. **Delivery, Storage and Handling**

1.7.1. Equipment shall be handled and stored in accordance with manufacturer's instructions. One (1) copy of these instructions shall be included with the equipment at time of shipment.

1.8. **Operation and Maintenance Manuals**

1.8.1. Equipment operation and maintenance manuals shall be provided with each assembly shipped and shall include instruction leaflets, instruction bulletins and renewal parts lists where applicable, for the complete assembly and each major component.

PART 2 - PRODUCTS

2.1. **Manufacturers**

2.1.1. Eaton

2.1.2. Square D

2.1.3. Siemens

The listing of specific manufacturers above does not imply acceptance of their products that do not meet the specified ratings, features and functions. Manufacturers listed above are not relieved from meeting these specifications in their entirety. Products in compliance with the

specification and manufactured by others not named will be considered only if pre-approved by the Engineer ten (10) days prior to bid date.

2.2. **Ratings**

2.2.1. Panelboards rated 240 Vac or less shall have short-circuit ratings as shown on the drawings or panelboard schedules, but not less than 10,000 amperes RMS symmetrical.

2.2.2. Panelboards rated 480 Vac shall have short-circuit ratings as shown on the drawings or panelboard schedules, but not less than 14,000 amperes RMS symmetrical.

2.2.3. Panelboards rated 600 Vac shall have short-circuit ratings as shown on the drawings or panelboard schedules, but not less than 10,000 amperes RMS symmetrical.

2.2.4. Panelboards shall be labeled with a CSA short-circuit rating. Series rated panelboards shall be provided with a label or manual stating the conditions of the CSA series ratings. Information in the manual shall include, at minimum:

2.2.4.1. Size and type of upstream device
2.2.4.2. Branch devices that can be used
2.2.4.3. CSA tested and listed series short-circuit rating

2.3. **Construction**

2.3.1. Interiors shall be completely factory assembled. They shall be designed such that switching and protective devices can be replaced without disturbing adjacent units and without removing the main bus connectors.

2.3.2. Trims for branch circuit panelboards shall be supplied with a hinged door over all circuit breaker handles. Doors in panelboard trims shall not uncover any live parts. Doors shall have a semi flush cylinder lock and catch assembly. Door-in-door trim shall be provided. Both hinged trim and trim door shall utilize three-point latching. No tools shall be required to install or remove trim. Trim shall be equipped with a door-actuated trim locking tab. Equip locking tab with provision for a screw such that removal of trim requires a tool, at the owner's option. Installation shall be tamper resistant with no exposed hardware on the panelboard trim.

2.3.3. Distribution panelboard trims shall cover all live parts. Switching device handles shall be accessible.

2.3.4. Surface trims shall be same height and width as box. Flush trims shall overlap the box by 3/4 of an inch on all sides.

2.3.5. A directory card with a clear plastic cover shall be supplied and mounted on the inside of each door.

2.3.6. All locks shall be keyed alike.

2.4. **Bus**

2.4.1. Main bus bars shall be tin-plated copper sized in accordance with CSA standards to limit temperature rise on any current carrying part to a maximum of 65 degrees C above an ambient of 40 degrees C maximum.

2.4.2. A system ground bus shall be included in all panels.

2.4.3. Full-size (100%-rated) insulated stand-off neutral bars shall be included for panelboards shown with neutral. Bus bar taps for panels with single-pole branches shall be arranged for sequence phasing of the branch circuit devices. Neutral busing shall have a suitable lug for each outgoing feeder requiring a neutral connection. 200%-rated neutrals shall be supplied for panels designated on drawings with oversized neutral conductors.

2.5. **Branch circuit Panelboards – Circuit breaker**

2.5.1. The minimum short-circuit rating for branch circuit panelboards shall be 10,000 amperes symmetrical at 240 volts, and 14,000 amperes symmetrical at 480 volts, 10,000 amperes symmetrical at 600 volts or as indicated on the drawings.

2.5.2. Bolt-on type, heavy-duty, quick-make, quick-break, single- and multi-pole circuit breakers of the types specified herein, shall be provided for each circuit with toggle handles that indicate when unit has tripped.

2.5.3. All circuit breakers shall be thermal-magnetic type with common handle for all multiple pole circuit breakers. Circuit breakers shall be minimum 100-ampere frame. Ratings through 100-ampere trip shall take up the same pole spacing. Circuit breakers shall be CSA listed as type SWD for lighting circuits.

2.5.4. Circuit breaker handle locks (ON position) shall be provided for all circuits that supply exit signs, emergency lights, energy management, and control system (EMCS) panels and fire alarm panels.

2.6. **Distribution Panelboards – Circuit Breaker Type**

2.6.1. Distribution panelboards equipped with bolt-on devices shall have interrupting ratings as indicated on the drawings.

2.6.2. Where indicated, provide circuit breakers CSA listed for application at 100% of their continuous ampere rating in their intended enclosure.

2.6.3. Main breaker protective devices shall be Eaton type Power Defense or approved equal moulded case circuit breakers with inverse time tripping characteristics.

2.6.4. Circuit breakers shall be operated by a toggle-type handle and shall have a quick-make, quick-break over-center switching mechanism that is mechanically trip-free. Automatic tripping of the breaker shall be clearly indicated by the handle position. Contacts shall be non-welding silver alloy and arc extinction shall be accomplished by means of DE-ION arc chutes. A push-to-trip button on the front of the circuit breaker shall provide a local manual means to exercise the trip mechanism.

2.6.5. Circuit breakers shall have a minimum symmetrical interrupting capacity as indicated on the contract documents.

2.6.6. Circuit breakers to be either draw-out or fixed mounted, as indicated on Contract Documents

2.6.7. Circuit breakers shall have microprocessor-based rms sensing trip units as specified below:

2.6.7.1. All moulded case circuit breakers shall be equipped with a true RMS sensing, solid-state tripping system consisting of at least three current sensors microprocessor-based trip device and trip actuator. The trip unit shall use microprocessor-based technology to provide the basic adjustable time-current protection.

2.6.7.2. Provide trip units with integral arc flash reduction mode for 1200A frame and above. The use of zone selective interlocking to emulate this feature does not meet the intent of these specifications and will not be allowed.

2.6.7.3. System coordination shall be provided by adjusting rotary switches for the following microprocessor-based time-current curve shaping adjustments:

2.6.7.3.1. Adjustable long-delay pick-up setting with minimum of 10 settings

2.6.7.3.2. Adjustable long-delay time - 0.5 to 24 seconds

2.6.7.3.3. Adjustable short-delay pick-up setting – 1.5x to Max allowable by frame

2.6.7.3.4. Adjustable short-delay time 0.0 sec up to 0.5 sec depending on frame with selectable flat or I2t curve shaping

2.6.7.3.5. Adjustable instantaneous setting 2x to Max allowable by frame

2.6.7.3.6. Where indicated, adjustable ground fault current pickup (0.2 – 1.0 x In in 0.10x increments) and time (0.1 – 1.0 sec in 0.10sec increments), with selectable flat or I^2t curve shaping. Provide switch selectable options for GF OFF, GF alarm, or GF trip.

2.6.7.4. Where indicated provide 100% rated CSA listed circuit breakers.

2.6.7.5. Trip units shall be capable of metering phase, neutral, and ground current with an accuracy of +/- 2.0% of the reading.

2.6.7.6. Trip units shall have an integral, high resolution liquid-crystal display (LCD) capable of displaying the trip unit programming, status, and monitoring information including bar graph display.

2.6.7.7. Trip units shall include embedded Modbus RTU communication capability. Breaker status and all monitored parameters shall be available.

2.6.7.8. Trip units shall collect and store pertinent information to the trip unit and circuit breaker health and event history. The trip unit shall also include diagnostic features to allow the user to investigate events and dynamically monitor the health of the trip unit and the breaker.

2.6.7.8.1. Number of operations (load and no-load)

2.6.7.8.2. Number of trips (overload trips, short circuit trips)

2.6.7.8.3. Run time

2.6.7.8.4. Breaker ambient temperature.

2.6.7.8.5. Breaker remaining life - The trip unit shall utilize an algorithm that applies a weighted value to monitored information to determine the remaining life of the breaker. The remaining life of the breaker shall be displayed or communicated in calculated percentage of life remaining.

2.6.7.8.6. All breaker health information shall be accessible via micro-USB port on front of trip unit and via embedded communications

2.6.7.9. Trip unit shall perform a waveform capture on trip, alarm, or user-initiated events.

2.6.7.9.1. Any breaker trip event shall capture a 10-cycle waveform. The trip unit shall store the most recent trip event waveform.

2.6.7.9.2. Any alarm event or user-initiated waveforms shall capture a 1-cycle waveform.

2.6.7.9.3. Waveform events shall capture and store all phase, neutral and ground currents.

2.6.8. Distribution circuit breakers shall be fixed mounted type and equipped with either microprocessor-based trip units (as stated above) or thermal magnetic trip units as scheduled on the contract drawings.

2.6.9. Provide shunt trips, bell alarms, and auxiliary switches as shown on the contract drawings.

2.7. **Distribution panelboards – circuit breaker type – draw-out**

2.7.1. Molded Case Circuit Breakers shall come complete with draw-out feature. Draw-out cassette shall consist of two separate components:

2.7.1.1. Moveable mechanism, which is attached to the breaker. 600A Maximum frame size. IC up to 65ka at 600V, 200k at 208V.

2.7.1.2. Stationary mechanism, which houses the cassette.

2.7.1.2.1. Cassettes mounted on a PRL4 distribution chassis

2.7.1.2.2. Single and twin mounting of cassettes is available.

2.7.2. Features of the draw-out cassette shall include:

2.7.2.1. Interlock system will not allow the breaker to be connected or disconnected while in the ON position.

2.7.2.2. Secondary Terminal Block - If required, the draw-out cassette includes a secondary terminal block for wiring of low voltage accessories, such as shunt trip, undervoltage release, auxiliary contacts, Zone Selective Interlocking, neutral sensor.

2.7.3. The draw-out mechanism shall have three positions:

2.7.3.1. Connected - The breaker is fully connected to the primary stabs and secondary terminal block (when supplied).

2.7.3.2. Disconnected - Both the primary stabs and the secondary terminal block (when supplied) are disconnected. A racking handle inserts into the racking port through the dead front cover. A position indicator, viewable through the dead front cover, indicates the position of the breaker.

2.7.3.3. Withdrawn - The breaker can be removed from the cassette. Two handles on dead front cover allow for easy breaker removal.

2.7.4. Additional safety features include:

2.7.4.1. No covers must be removed or cables disconnected to remove or insert a breaker.

2.7.4.2. A safety mesh surrounds the cassette inside the switchboard or panelboard to prevent objects from falling into the cassette.

2.7.4.3. A clear cover is provided over cable lugs, when the breaker is removed to prevent contact with lugs.

2.7.4.4. Optional IR viewing windows are available in front of cable lugs and line side connections of cassette.

2.7.4.5. Optional key interlocks are available.

2.8. **Enclosure**

2.8.1. Enclosures shall be at least 20 inches wide made from galvanized steel. Provide minimum gutter space in accordance with the Canadian Electrical Code. Where feeder cables supplying the mains of a panel are carried through its box to supply other electrical equipment, the box shall be sized to include the additional required wiring space. At least four interior mounting studs with adjustable nuts shall be provided.

2.8.2. Enclosures shall be provided with one (1) blank end and one (1) end with knockouts

2.8.3. Optional enclosure types are available, such as: Sprinklerproof (per CEC 26-008), Type 2, Type 3R, Type 12, Type 4, Type 4X

2.8.4. Where indicated on the drawings, branch circuit panelboards shall be column width type.

2.9. **Nameplates**

2.9.1. Provide an engraved nameplate for each panel section.

2.10. **Finish**

2.10.1. Surfaces of the trim assembly shall be properly cleaned, primed, and a finish coat of gray ANSI 61 paint applied.

2.10.2. Special colours are available for trim and/ or box/ enclosure.

2.11. **Miscellaneous Devices**

2.11.1. Custom panelboard features available. Contact manufacturer.

PART 3 - EXECUTION

3.1. **Factory Testing**

3.1.1. The following standard factory tests shall be performed on the equipment provided under this section. All tests shall be in accordance with the latest version of NEMA and CSA standards.

3.2. **Installation**

3.2.1. Contractors shall install all equipment per the manufacturer's recommendations and the contract drawings

3.2.2. Equipment warranty shall be extended to two years from date of installation when service representatives employed by the equipment manufacturer perform installation.

Table of Contents

PART 1 - GENERAL

1.1. REFERENCES

1.1.1. American Society for Testing and Materials (ASTM).

1.1.1.1. ASTM C117, Standard Test Method for Material Finer Than 0.075 mm (No. 200) Sieve in Mineral Aggregates by Washing.

1.1.1.2. ASTM C136, Standard Test Method for Sieve Analysis of Fine and Coarse Aggregates.

1.1.1.3. ASTM D422, Standard Test Method for Particle-Size Analysis of Soils.

1.1.1.4. ASTM D698, Standard Test Method for Laboratory Compaction Characteristics of Soil Using Standard Effort (12,400 ft-lbf/ft^3) (600 kN-m/m^3).

1.1.1.5. ASTM D1557, Test Method for Laboratory Compaction Characteristics of Soil Using Modified Effort (56,000 ft-lbf/ft^3) (2,700 kN-m/m^3).

1.1.1.6. ASTM D4318, Standard Test Methods for Liquid Limit, Plastic Limit, and Plasticity Index of Soils.

1.1.2. Canadian General Standards Board (CGSB).

1.1.2.1. CAN/CGSB-8.1, Sieves, Testing, Woven Wire, Inch Series.

1.1.2.2. CA/CGSB-8.2, Sieves, Testing, Woven Wire, Metric

1.1.3. Canadian Standards Association (CSA)

1.1.3.1. CAN/CSA-A3000, Cementitious Materials Compendium (Consists of A3001, A3002, A3003, A3004 and A3005).

1.1.3.1.1. CSA-A3001, Cementitious Materials for Use in Concrete.

1.1.3.2. CSA-A23.1/A23.2, Concrete Materials and Methods of Concrete Construction/ Methods of Test and Standard Practices for Concrete.

1.2. DEFINITIONS

1.2.1. Excavation classes: two classes of excavation will be recognized; common excavation and rock excavation.

1.2.1.1. Rock excavation: excavation of material from solid masses of igneous, sedimentary or metamorphic rock which, prior to its removal, was integral with its parent mass, and boulders or rock fragments having individual volume in excess of 1 m^3. Frozen material not classified as rock.

1.2.1.2. Common excavation: excavation of materials of whatever nature, which are not included under definitions of rock excavation.

1.2.2. Unclassified excavation: excavation of deposits of whatever character encountered in Work.

1.2.3. Topsoil: material capable of supporting good vegetative growth and suitable for use in top dressing, landscaping and seeding.

1.2.4. Waste material: excavated material unsuitable for use in Work or surplus to requirements.

1.2.5. Borrow material: material obtained from locations outside area to be graded, and required for construction of fill areas or for other portions of Work.

1.2.6. Unsuitable materials:

1.2.6.1. Weak and compressible materials under excavated areas.
1.2.6.2. Frost susceptible materials under excavated areas.
1.2.6.3. Frost susceptible materials:
1.2.6.3.1. Fine grained soils with plasticity index less than 10 when tested to ASTM D4318, and gradation within limits specified when tested to ASTM D422 and ASTM C136: Sieve sizes to CAN/CGSB-8.1.

Sieve Designation	%Passing
2.00 mm	100
0.10 mm	45-100
0.02 mm	10-80
0.005 mm	0-45

1.2.7. Coarse grained soils containing more than 20% by mass passing 0.075 mm sieve.

1.3. **SUBMITTALS**

1.3.1. Inform Owner at least four (4) weeks prior to commencing Work, of proposed source of fill materials and provide access for sampling.

1.3.2. Submit 70 kg samples of type of fill specified including representative samples of excavated material.

1.3.3. Ship samples as directed by Owner in tightly closed containers to prevent contamination.

1.4. **QUALITY ASSURANCE**

1.4.1. Submit design and supporting data at least two (2) weeks prior to commencing Work.

1.4.2. Design and supporting data submitted to bear stamp and signature of qualified professional engineer registered or licensed in the province of Newfoundland and Labrador.

1.4.3. Keep design and supporting data on site.

1.4.4. Engage services of qualified professional engineer who is registered or licensed in Province of Newfoundland and Labrador to design and inspect cofferdams, shoring, bracing and underpinning required for Work.

1.4.5. Do not use soil material until written report of soil test results are reviewed and approved by Owner.

1.5. **EXISTING CONDITIONS**

1.5.1. Buried services:

1.5.1.1. Before commencing Work verify location of buried services on and adjacent to site.
1.5.1.2. Arrange with appropriate authority for relocation of buried services that interfere with execution of Work: pay costs of relocating services.
1.5.1.3. Remove obsolete buried services within 2 m of foundations: cap cut-offs.
1.5.1.4. Size, depth and location of existing utilities and structures as indicated are for guidance only. Completeness and accuracy are not guaranteed.
1.5.1.5. Prior to commencing excavation Work, notify applicable Owner or authorities having jurisdiction, establish location and state of use of buried utilities and structures. Owners or authorities having jurisdiction to clearly mark such locations to prevent disturbance during Work.
1.5.1.6. Confirm locations of buried utilities by careful test excavations.
1.5.1.7. Maintain and protect from damage, water, sewer, gas, electric, telephone and other utilities and structures encountered as indicated.
1.5.1.8. Where utility lines or structures exist in area of excavation, obtain direction of Owner before removing or re-routing.
1.5.1.9. Record location of maintained, re-routed and abandoned underground lines.
1.5.1.10. Confirm locations of recent excavations adjacent to area of excavation.

1.5.2. Existing buildings and surface features:

1.5.2.1. Conduct, with Owner condition survey of existing buildings, trees and other plants, lawns, fencing, service poles, wires, rail tracks, pavement, survey bench marks and monuments which may be affected by Work.
1.5.2.2. Protect existing buildings and surface features from damage while Work is in progress. In event of damage, immediately make repair to approval of Owner.
1.5.2.3. Where required for excavation, cut roots or branches as approved by Owner.

PART 2 - PRODUCTS

2.1. **MATERIALS**

2.1.1. Backfill Type 1 and Type 2 fill: following requirements:

2.1.2. Crushed, pit run or screened stone, gravel or sand.

2.1.3. Gradations to be within limits specified when tested to ASTM C136 and ASTM C117. Sieve sizes to CAN/CGSB-8.1.

Sieve Designation	%Passing	
	Type1	Type2
75 mm	-	100
50 mm	-	-
37.5 mm	-	-
25 mm	100	-
19 mm	75-100	-
12.5 mm	-	-
9.5 mm	50-100	-
4.75 mm	30-70	22-85
2.00 mm	20-45	-
0.425 mm	10-25	5-30
0.180 mm	-	-
0.075 mm	3-8	0-10

2.1.4. Type 3 fill: selected material from excavation or other sources, approved by Owner for use intended, unfrozen and free from rocks larger than 75 mm, cinders, ashes, sods, refuse or other deleterious materials.

PART 3 - EXECUTION

3.1. SITE PREPARATION

3.1.1. Remove obstructions, ice and snow, from surfaces to be excavated within limits indicated.

3.2. PREPARATION/PROTECTION

3.2.1. Protect existing features in with Temporary Barriers and Enclosures and following applicable local regulations.

3.2.2. Keep excavations clean, free of standing water, and loose soil.

3.2.3. Where soil is subject to significant volume change due to change in moisture content, cover and protect to Owner’s approval.

3.2.4. Protect natural and man-made features required to remain undisturbed. Unless otherwise indicated or located in an area to be occupied by new construction, protect existing trees from damage. Protect buried services that are required to remain undisturbed.

3.3. **STRIPPING OF TOPSOIL**

3.3.1. Commence topsoil stripping of areas as indicated by Owner after area has been cleared of brush, weeds and grasses and removed from site.

3.3.2. Strip topsoil to depths as indicated by Owner. Do not mix topsoil with subsoil.

3.3.3. Stockpile in locations as directed by Owner. Stockpile height not to exceed 2.0 m.

3.3.4. Dispose of unused topsoil as directed by Owner.

3.4. **STOCKPILING**

3.4.1 Stockpile fill materials in areas designated by Owner. Stockpile granular materials in manner to prevent segregation.

3.4.2 Protect fill materials from contamination.

3.5. **COFFERDAMS, SHORING, BRACING AND UNDERPINNING**

3.5.1. Maintain sides and slopes of excavations in safe condition by appropriate methods.

3.5.2. Obtain permit from authority having jurisdiction for temporary diversion of water course.

3.5.3. Construct temporary works to depths, heights and locations as indicated or approved by Owner.

3.5.4. During backfill operation:

3.5.4.1. Unless otherwise as indicated or as directed by Owner remove sheeting and shoring from excavations.

3.5.4.2. Do not remove bracing until backfilling has reached respective levels of such bracing.

3.5.4.3. Pull sheeting in increments that will ensure compacted backfill is maintained at an elevation at least 500 mm above toe of sheeting.

3.5.5. When sheeting is required to remain in place, cut off tops at elevations as indicated.

3.5.6. Upon completion of substructure construction:

3.5.6.1. Remove cofferdams, shoring and bracing.

3.5.6.2. Remove excess materials from site and restore water courses as indicated and as directed by Owner.

3.6. **DEWATERING AND HEAVE PREVENTION**

3.6.1. Keep excavations free of water while Work is in progress.

3.6.2. Submit for Owner's review details of proposed dewatering or heave prevention methods, such as dikes, well points, and sheet pile cut-offs.

3.6.3. Avoid excavation below groundwater table if quick condition or heave is likely to occur. Prevent piping or bottom heave of excavations by groundwater lowering, sheet pile cut-offs, or other means.

3.6.4. Protect open excavations against flooding and damage due to surface run-off.

3.6.5. Dispose of water in accordance in manner not detrimental to public and private property, or any portion of Work completed or under construction.

3.6.6. Provide flocculation tanks, settling basins, or other treatment facilities to remove suspended solids or other materials before discharging to storm sewers, water courses or drainage areas.

3.7. **EXCAVATION**

3.7.1. Excavate to lines, grades, elevations and dimensions as indicated by Owner.

3.7.2. Remove concrete, masonry, paving, walks, demolished foundations and rubble and other obstructions encountered during excavation

3.7.3. Excavation must not interfere with bearing capacity of adjacent foundations.

3.7.4. Do not disturb soil within branch spread of trees or shrubs that are to remain. If excavating through roots, excavate by hand and cut roots with sharp axe or saw.

3.7.5. For trench excavation, unless otherwise authorized by Owner in writing, do not excavate more than 30 m of trench in advance of installation operations and do not leave open more than 15 m at end of day's operation.

3.7.6. Keep excavated and stockpiled materials a safe distance away from edge of trench as directed by Owner.

3.7.7. Restrict vehicle operations directly adjacent to open trenches.

3.7.8. Dispose of surplus and unsuitable excavated material off site.

3.7.9. Do not obstruct flow of surface drainage or natural watercourses.

3.7.10. Earth bottoms of excavations to be undisturbed soil, level, free from loose, soft or organic matter.

3.7.11. Notify Owner when bottom of excavation is reached.

3.7.12. Obtain Owner approval of completed excavation.

3.7.13. Remove unsuitable material from trench bottom to extent and depth as directed by Owner.

3.7.14. Correct unauthorized over-excavation as follows:

3.7.14.1. Fill under bearing surfaces and footings with concrete specified for footings.

3.7.14.2. Fill under other areas with Type 2 fill compacted to not less than 95% of corrected maximum dry density.

3.7.15. Hand trim, make firm and remove loose material and debris from excavations. Where material at bottom of excavation is disturbed, compact foundation soil to density at least equal to undisturbed soil. Clean out rock seams and fill with concrete mortar or grout to approval of Owner.

3.8. **FILL TYPES AND COMPACTION**

3.8.1. Use fill of types as indicated or specified below. Compaction densities are percentages of maximum densities obtained from ASTM D698 corrected maximum dry density.

3.8.1.1. Exterior side of perimeter walls: use Type 3 fill to subgrade level. Compact to 95%.

3.8.1.2. Within building area: use Type 2 to underside of base course for floor slabs. Compact to 98%.

3.8.1.3. Under concrete slabs: provide 150 mm compacted thickness base course of Type 1 fill to underside of slab. Compact base course to 100%.

3.8.1.4. Retaining walls: use Type 2 fill to subgrade level on high side for minimum 500 mm from wall and compact to 95%. For remaining portion, use Type 3 fill compacted to 95%.

3.8.1.5. To correct over excavation in trenches: use Type 2 fill to underside of sand bedding compacted to 95%.

3.9. **BEDDING AND SURROUND OF UNDERGROUND SERVICES**

3.9.1. Place and compact granular material for bedding and surround of underground services as indicated.

3.9.2. Place bedding and surround material in unfrozen condition.

3.10. **BACKFILLING**

3.10.1. Vibratory compaction equipment: approved by Owner.

3.10.2. Do not proceed with backfilling operations until Owner has inspected and approved installations.

3.10.3. Areas to be backfilled to be free from debris, snow, ice, water and frozen ground.

3.10.4. Do not use backfill material which is frozen or contains ice, snow or debris.

3.10.5. Place backfill material in uniform layers not exceeding 150 mm compacted thickness up to grades indicated. Compact each layer before placing succeeding layer.

3.10.6. Backfill around installations.

3.10.6.1. Place bedding and surround material as specified elsewhere.

3.10.6.2. Do not backfill around or over cast-in-place concrete within 24 hours after placing of concrete.

3.10.6.3. Place layers simultaneously on both sides of installed Work to equalize loading. Difference not to exceed 600 mm.

3.10.6.4. Where temporary unbalanced earth pressures are liable to develop on walls or other structures.

3.10.6.4.1. Permit concrete to cure for minimum fourteen (14) days or until it has sufficient strength to withstand earth and compaction pressure, and approval obtained from Owner, or

3.10.6.4.2. If approved by Owner, erect bracing or shoring to counteract unbalance, and leave in place until removal is approved by Owner.

3.11. **RESTORATION**

3.11.1. Upon completion of Work, remove waste materials and debris, trim slopes, and correct defects as directed by Owner.

3.11.2. Replace topsoil as indicated by Owner.

3.11.3. Reinstate lawns to elevation which existed before excavation.

3.11.4. Reinstate pavement and sidewalks distributed by excavation to thickness, structure, and elevation which existed before excavation.

3.11.5. Clean and reinstate areas affected by Work as directed by Owner.

3.11.6. Use temporary plating to support traffic loads over unshrinkable fill for initial 24 h.

HALTON COMMUNITY HOUSING CORPORATION

ROTARY GARDEN-POWER & HVAC UPGRADES

234–274 WOODSIDE DR. &
1285–1299 SEDGEWICK CR.
OAKVILLE, ON
L6L 4K9 & L6L 1X7

ISSUED FOR TENDER
JULY 2024

DRAWING LIST

NO.	DRAWING TITLE
M–1	KEY PLAN, SYMBOLS LIST, EQUIPMENT SCHEDULES & DETAILS– MECHANICAL
M–2	BOILER ROOMS LAYOUT – DEMOLITION WORKS MECHANICAL
M–3	TYPICAL SUITES LAYOUT – EXISTING & DEMOLITION WORKS – MECHANICAL
M–4	TYPICAL SUITES LAYOUT – NEW WORKS – MECHANICAL
M–5	NORTH BLOCKS – NEW WORK – MECHANICAL
M–6	SOUTH BLOCKS – NEW WORK – MECHANICAL
E–1	ELECTRICAL SITE PLAN
E–2	ELECTRICAL SERVICES DETAILS
E–3	ELECTRICAL SERVICES SINGLE LINE DIAGRAMS
E–4	BOILER ROOMS POWER LAYOUT DEMO & NEW
E–5	TYPICAL SUITE PLANS POWER LAYOUT NEW WORKS

SAB ENGINEERING Inc.

SCHEDULE OF OUTDOOR HEAT PUMP CONDENSERS

TAG	LOCATION	MANUFACTURER	MODEL	COOLING CAP. TONS [MBH]	HEATING CAP. KW [MBH]	REFRIGERANT	CONNECTION SIZES		EQUIPMENT SIZE (HxWxD, INCH)	POWER SUPPLY (V/PH/Hz)	MCA	MOCP	WEIGHT KG [LB]	NOTES
							RL (MM/IN)	RG (MM/IN)						
HP-1	OUTDOOR	DAIKIN	3MXL24WMVJU9	2.0 [24]	7.0 [24]	R410A	(3)x8 [1/4]	(2)x12 [1/2] (1)x10 [3/8]	29x34x12.5	208/1/60	20.1	25	65 [143]	WORK WITH 2 INDOOR EVAPORATORS

NOTES:

1. PROVIDE ALL INTERCONNECTED REFRIGERANT LINE SET BETWEEN INDOOR AND OUTDOOR UNIT.
2. ALL THE FINAL SIZE FOR THE REFRIGERATION PIPES TO BE BY THE UNIT/ SYSTEM MANUFACTURER BASED ON FINAL ROUTING.
3. MANUFACTURER TO PROVIDE DETAILED PIPE SIZE AND SCHEMATIC AS PART OF SHOP DRAWINGS SUBMITTAL.
4. ALL VRF HEAT PUMPS WILL OPERATE IN HEATING AND COOLING MODE.

SCHEDULE OF INDOOR A/C EVAPORATOR

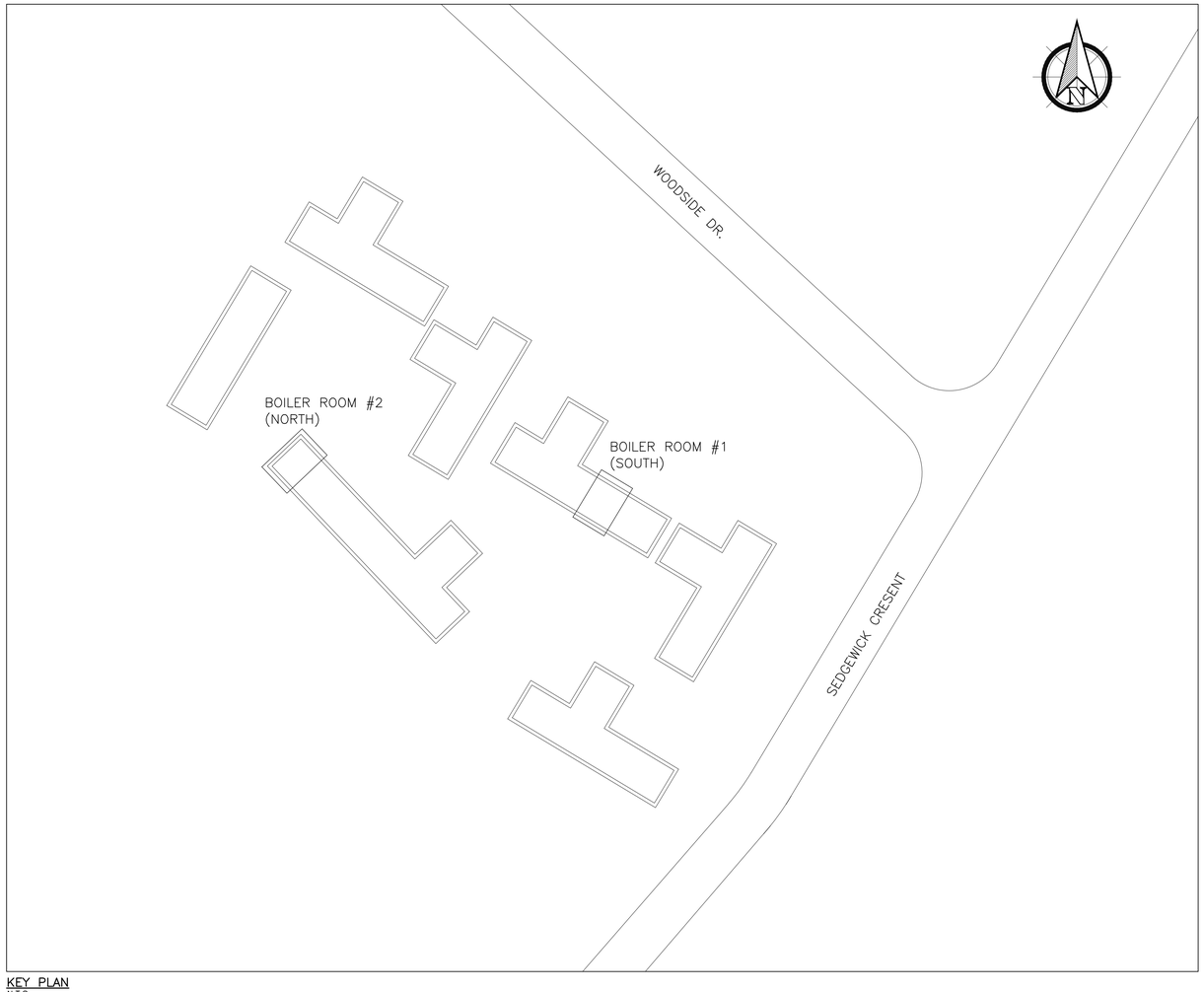
TAG	TYPE	SERVE	MANUFACTURER	MODEL	CLG. CAP. TONS/[MBH]	HTG. CAP. KW/[MBH]	AIR FLOW (CFM)		POWER SUPPLY (V/PH/Hz)	MCA (A)	MOCP (A)	WEIGHT KG/LBS	EQUIPMENT SIZE (HxWxD, INCH)	REFRIG. PIPE (MM)		DRAIN (MM)	REMARKS
							COOLING	HEATING						LIQUID	GAS		
AC-1	WALL MOUNTED	BEDROOM	DAIKIN	CTXS07WVJU9	0.58/7.0	2.0 [7.0]	194-332	233-350	208/1ø/60	-		9.0/20	11.6x31.5x8.4	6.4	9.5	16	-
AC-2	WALL MOUNTED	LIVING ROOM	DAIKIN	FTXS15WVJU9	1.25/15.0	4.4 [15]	385-568	417-593	208/1ø/60	-		14/31	13.4x41.3x9.75	6.4	12.7	16	

NOTES:

1. ALL INDOOR UNITS TO BE PROVIDED WITH CONDENSATE PUMPS, DAIKIN ONE + SMART THERMOSTAT FOR VRV, SKYAIR, SINGLE AND MULTI ZONE SYSTEM
2. POWER FOR INDOOR UNIT PROVIDED FROM OUTDOOR HEAT PUMP

SCHEDULE OF BACK-UP ELECTRIC HEATER

TAG	TYPE	SERVE	MANUFACTURER	MODEL	HTG. CAP. KW/[MBH]	POWER SUPPLY (V/PH/Hz)	MCA (A)	MOCP (A)	WEIGHT KG/LBS	EQUIPMENT SIZE (LENGTH, MM)	REMARKS
EH-1	FLOOR MOUNTED	BEDROOM	STELPRO	AB0751	0.75 [2.6]	120/1ø/60	-	15	4.0/9.0	950	-
EH-2	FLOOR MOUNTED	LIVING ROOM	STELPRO	AB01258	1.25 [4.3]	208/1ø/60	-	15	6.4/14	1500	



KEY PLAN
N.T.S.

SYMBOLS LIST - PLUMBING

SYMBOL	DESCRIPTION
DCW	DOMESTIC COLD WATER SUPPLY
G	GAS PIPE (LOW PRESSURE)
HWS	HEATING WATER SUPPLY
HWR	HEATING WATER RETURN
RG	REFRIGERANT GAS
RL	REFRIGERANT LIQUID
CD	CONDENSATE DRAIN
FD	FLOOR DRAIN
FFD	FUNNEL FLOOR DRAIN
	UNION
AV	MANUAL AIR VENT
	PUMP
	AUTOMATIC CONTROL VALVE - TWO WAY
	MIXING OR DIVERTER VALVE (3-WAY)
	VALVE
	BALANCING VALVE
	CIRCUIT SETTER
	CHECK VALVE
	STRAINER - OVER 50mm PROVIDE WITH VALVED FLUSHING DRAIN
SV	SUPERVISED VALVE
	PRESSURE REDUCING VALVE
	PRESSURE RELIEF VALVE
	PLUG VALVE (GAS)
	PIPE ANCHOR
TG	THERMOMETER
PG	PRESSURE GUAGE
	DEMOLITION
	PIPE TURNING DOWN
	PIPE TURNING UP

REVISION NO.

No.	DATE	DESCRIPTION
1.	18/07/2024	ISSUED FOR PERMIT & TENDE

THE CONTRACTOR MUST VERIFY ALL DIMENSIONS ON AND REPORT ANY DISCREPANCIES TO THE ENGINEER BEFORE PROCEEDING WITH THE WORK.

DO NOT SCALE DRAWINGS.

SEAL

LICENSED PROFESSIONAL ENGINEER
JULY 2024
G. STRASHUN
PROVINCE OF ONTARIO

NORTH | TRUE NORTH

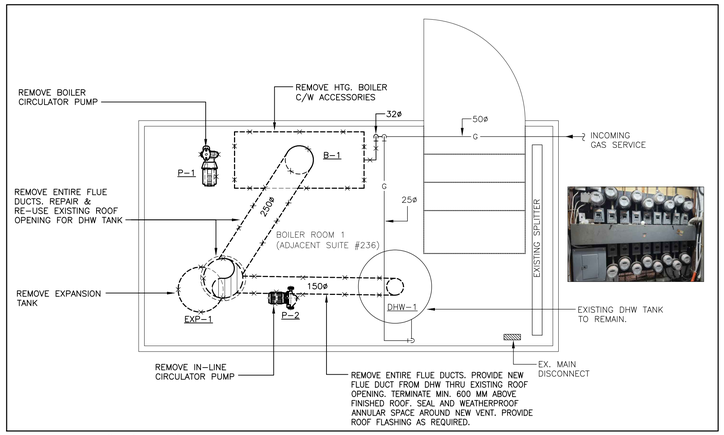
CONSULTANT

SAB ENGINEERING Inc.
588 EDWARD AVE., UNIT 25, RICHMOND HILL, ONT., L4C 9Y6
TEL. (905)-787 8885 FAX (905)-787 8771

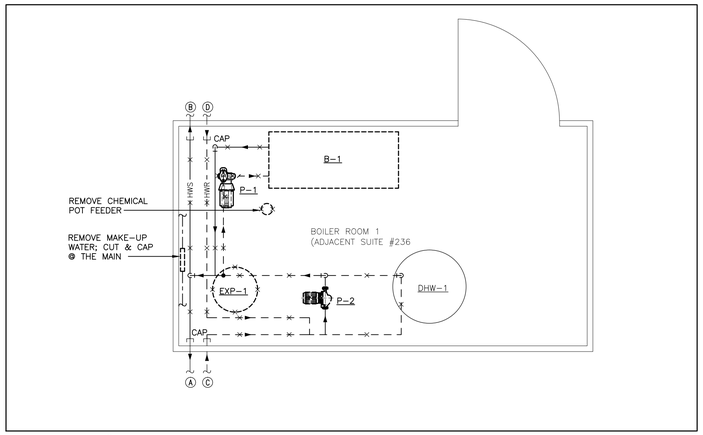
PROJECT
SERVICE UPGRADES
WOODSIDE DR. & SEDGEWICK CRES
OAKVILLE, ONTARIO L6L 4K9

DRAWING TITLE
KEY PLAN, SYMBOLS LIST, EQUIPMENT SCHEDULES & DETAILS-MECHANICAL

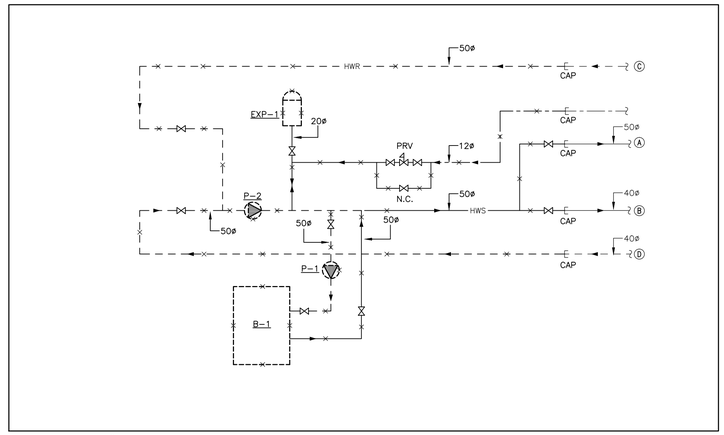
DATE	SCALE
APR. 24	N.T.S.
DRAWN BY: T.N.	DWG. No. M-1
JOB No. 2024-35	



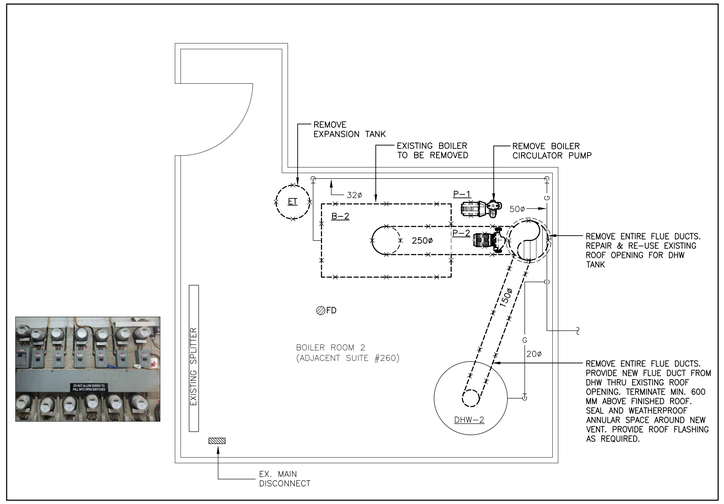
BOILER ROOM #1 (NORTH) EQUIPMENT LAYOUT – EXISTING & DEMOLITION WORK
SCALE: 1:25



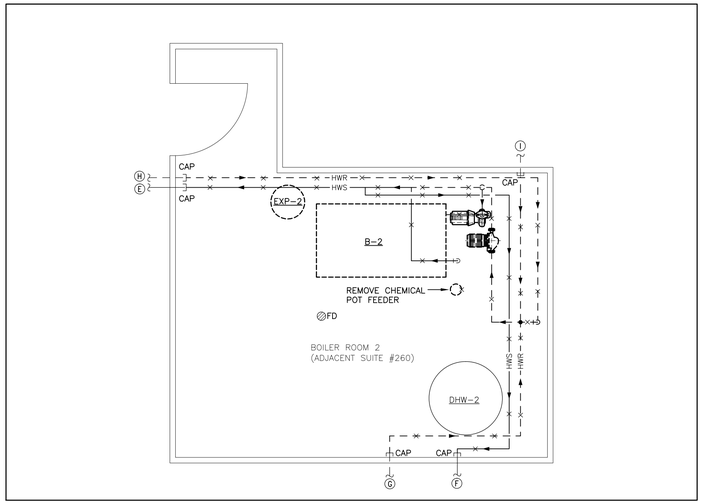
BOILER ROOM #1 PIPING LAYOUT – EXISTING & DEMOLITION WORK
SCALE: 1:25



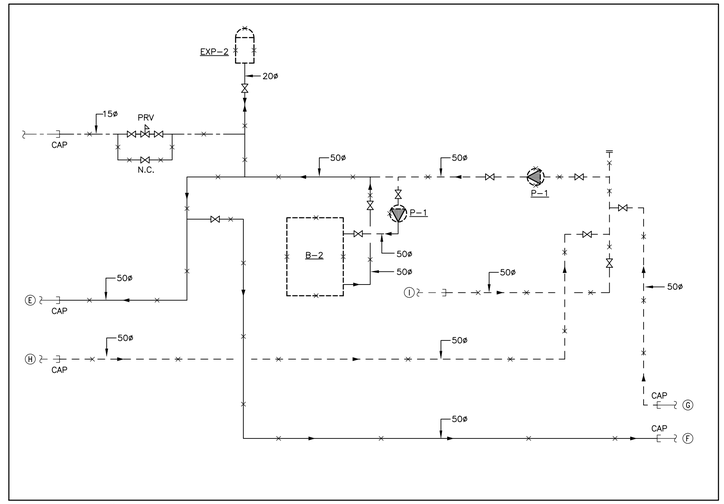
BOILER ROOM #1 PIPING SCHEMATIC DIAGRAM – EXISTING & DEMOLITION WORK
SCALE: N.T.S.



BOILER ROOM #2 EQUIPMENT LAYOUT – EXISTING & DEMOLITION WORK
SCALE: 1:25



BOILER ROOM #2 PIPING LAYOUT – EXISTING & DEMOLITION WORK
SCALE: 1:25



BOILER ROOM #2 PIPING SCHEMATIC DIAGRAM – EXISTING & DEMOLITION WORK
SCALE: N.T.S.

DEMOLITION NOTES:

THESE NOTES SHALL BE READ IN CONJUNCTION WITH, AND SHALL FORM AN INTEGRAL PART OF THE SPECIFICATIONS.

PRIOR TO COMMENCING THE DEMOLITION WORK, EXAMINE CAREFULLY THE ELEMENTS OF THE EXISTING HEATING SYSTEMS TO BE REMOVED. FOR REASONS OF CLARITY, THE DRAWINGS DO NOT SHOW ALL BUILDING SERVICES LOCATED IN THE BOILER ROOM OR ALL STRUCTURAL ELEMENTS. ALL BUILDING SERVICES AND OTHER UTILITIES NOT AFFECTED BY THIS WORK SHALL REMAIN OPERATIONAL. ANY DAMAGE TO BUILDING SERVICES AND UTILITIES NOT AFFECTED BY THE WORK SHALL BE PROMPTLY REPAIRED BY THE CONTRACTOR, AT NO COST TO THE BOARD.

THE SIZES AND LOCATION OF PIPING, EQUIPMENT AND OTHER UTILITIES INDICATED ON THE DRAWINGS WERE SITE MEASURED. MAKE ANY CHANGES REQUIRED TO SUIT THE ACTUAL SITE CONDITIONS AT NO COST TO THE BOARD.

REMOVE EXISTING HEATING BOILERS, BOILER SUPPORTS, PUMPS COMPLETE WITH SUPPORTS, EXPANSION TANK AND PIPING AS INDICATED AND AS REQUIRED TO ALLOW FOR THE INSTALLATION OF NEW EQUIPMENTS.

REMOVE THE EXISTING BOILER'S VENTS AS SHOWN INCLUDING PORTION ABOVE ROOF. ROOF OPENINGS TO BE REUSED.

ENSURE THAT DURING THE DEMOLITION WORK, THE FLOOR DRAINS ARE PROTECTED AGAINST CLOGGING WITH DEBRIS. REMOVE ALL REDUNDANT PIPE HANGERS AND SUPPORTS.

EXISTING DHW HEATERS TO REMAIN, EXISTING VENTS TO BE REMOVED.

REMOVE ALL REDUNDANT POWER WIRING, STARTERS AND DISCONNECTS ASSOCIATED WITH THE EQUIPMENT TO BE DEMOLISHED. REMOVE ALL EXISTING BAS CONTROLS, DEVICES AND OPERATORS ASSOCIATED WITH THE EQUIPMENT TO BE DEMOLISHED AND MAKE SAFE ALL WIRING MADE REDUNDANT. ENSURE THAT THE REST OF THE BAS SYSTEM REMAINS OPERATIONAL.

REMOVE SECTIONS OF THE GAS LINE ASSOCIATED WITH EQUIPMENT TO BE DEMOLISHED, ENSURE GAS SUPPLY TO DWH TANK MAINTAIN.

COORDINATE WITH THE OWNER REPRESENTATIVE UTILITIES SHUT-DOWN TIMING. WHEN REMOVING COLD WATER AND GAS PIPING, ENSURE THAT SERVICE TO OTHER END-USERS NOT AFFECTED BY THE PROJECT IS NOT INTERRUPTED.

THE WORK SHALL INCLUDE THE DRAINING OF THE EXISTING HEATING SYSTEM. ALL UNDERGROUND HEATING PIPES TO BE ABANDONED IN-PLACE.

EXISTING CHEMICAL TREATMENT EQUIPMENT TO BE REMOVED.

THE DEMOLITION WORK SHALL INCLUDE THE TEMPORARY OR PERMANENT RELOCATION OF ANY EXISTING BUILDING SERVICES OR ARCHITECTURAL ELEMENTS NOT SPECIFICALLY MENTIONED HEREIN BUT OBVIOUSLY NECESSARY FOR THE INSTALLATION OF THE NEW EQUIPMENT (SUCH AS, DRAINS, SANITARY VENTS, LIGHTING FIXTURES, CONDUITS, JUNCTION BOXES AND SIMILAR). AT THE CONCLUSION OF THE WORK, ALL BUILDING SERVICES AND ARCHITECTURAL ELEMENTS TEMPORARILY REMOVED SHALL BE REINSTATED AND MADE GOOD TO THEIR ORIGINAL CONDITION.

REVISION NO.

No.	DATE	DESCRIPTION
1.	18/07/2024	ISSUED FOR PERMIT & TENDE

THE CONTRACTOR MUST VERIFY ALL DIMENSIONS ON AND REPORT ANY DISCREPANCIES TO THE ENGINEER BEFORE PROCEEDING WITH THE WORK.

DO NOT SCALE DRAWINGS.

SEAL

LICENSED PROFESSIONAL ENGINEER
July 2024
G. STRASHUN
PROVINCE OF ONTARIO

NORTH | TRUE NORTH

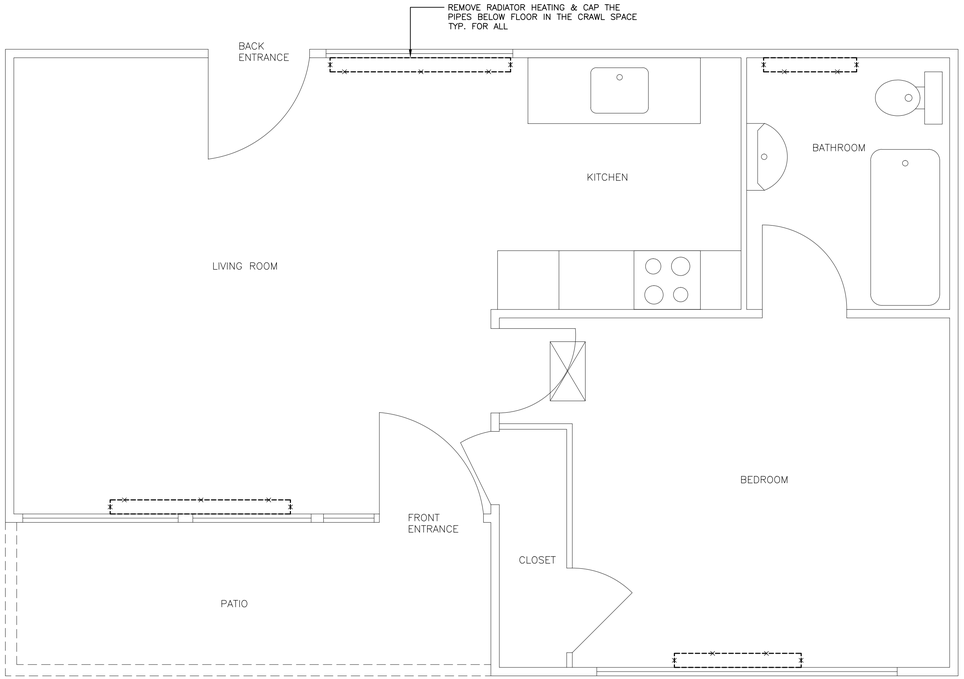
CONSULTANT

SAB ENGINEERING Inc.
588 EDWARD AVE., UNIT 25, RICHMOND HILL, ONT., L4C 9Y6
TEL. (905)-787 8885 FAX (905)-787 8771

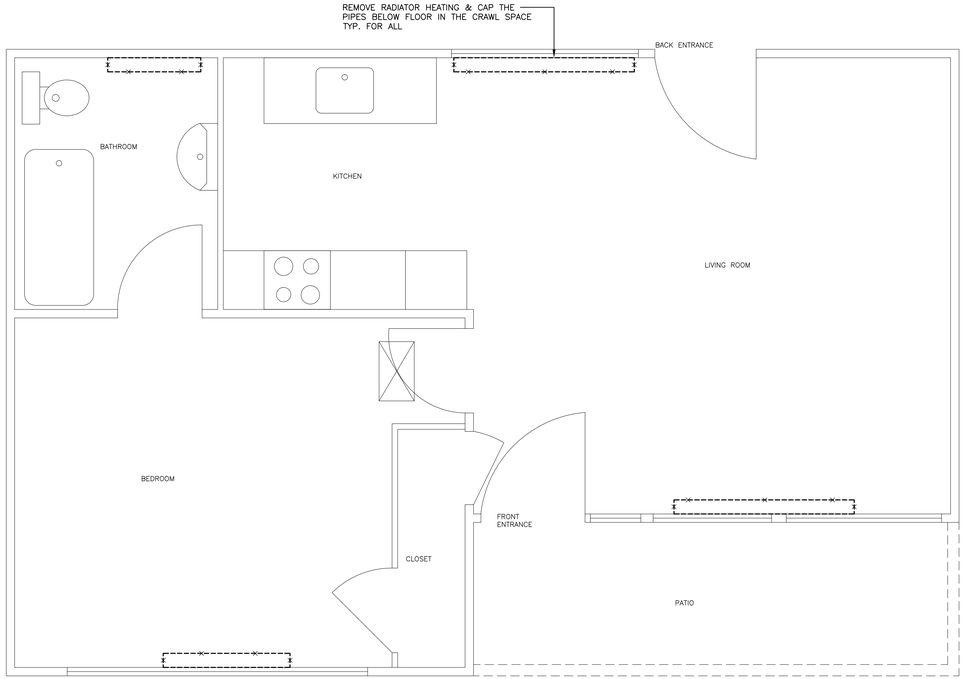
PROJECT
SERVICE UPGRADES
WOODSIDE DR. & SEDGEWICK CRES
OAKVILLE, ONTARIO L6L 4K9

DRAWING TITLE
BOILER ROOMS LAYOUT – DEMOLITION WORKS MECHANICAL

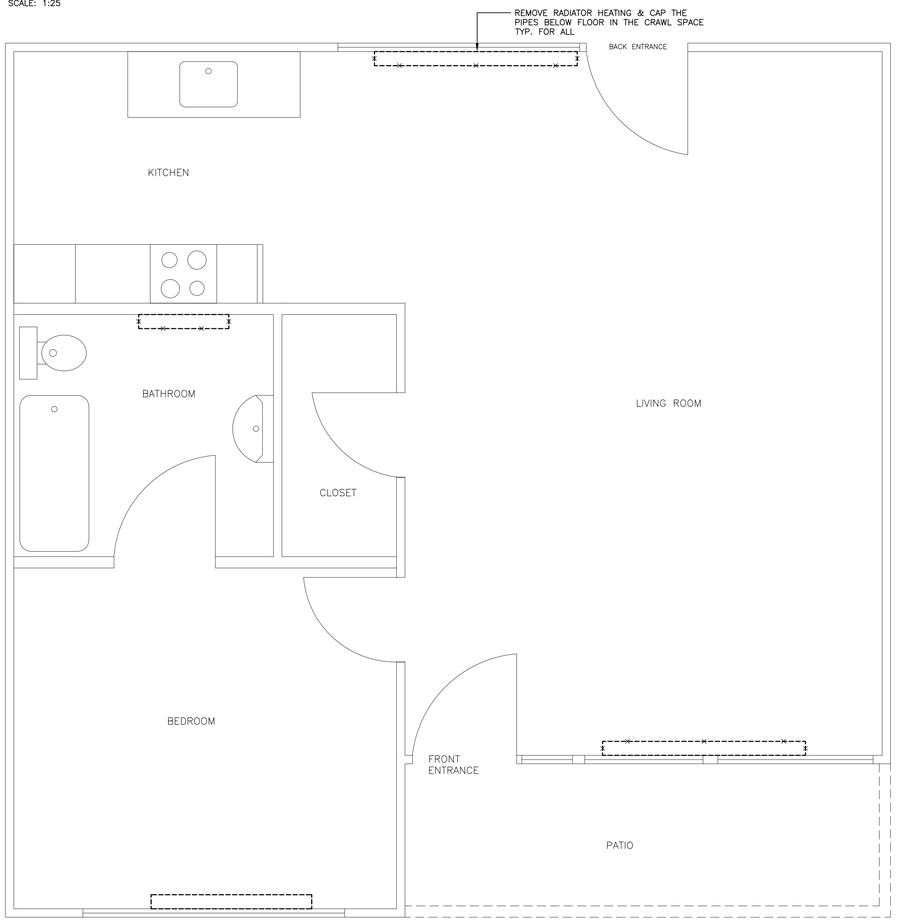
DATE	SCALE
APR. 24	1:25
DRAWN BY: T.N.	DWG. No. M-2
JOB No. 2024-35	



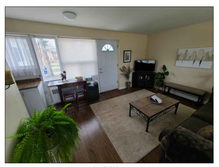
TYPICAL SUITE (PATIO ON THE LEFT OF FRONT ENTRANCE) – DEMOLITION WORKS
SCALE: 1:25



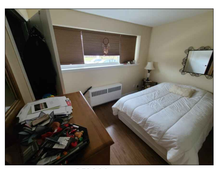
TYPICAL SUITE (PATIO ON THE RIGHT OF FRONT ENTRANCE) – DEMOLITION WORKS
SCALE: 1:25

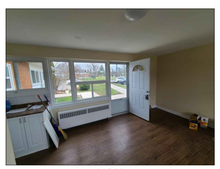


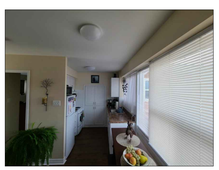
TYPICAL SUITE (#252, 254, 256, 258) – DEMOLITION WORKS
SCALE: 1:25

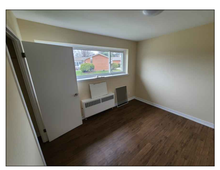

LIVING ROOM

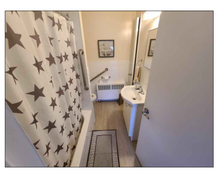

LIVING ROOM

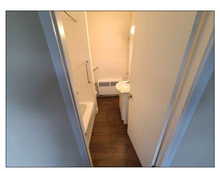

BEDROOM


LIVING ROOM


KITCHEN


BEDROOM


BATHROOM


BATHROOM

DEMOLITION NOTES:

THESE NOTES SHALL BE READ IN CONJUNCTION WITH, AND SHALL FORM AN INTEGRAL PART OF THE SPECIFICATIONS.

PRIOR TO COMMENCING THE DEMOLITION WORK, EXAMINE CAREFULLY THE ELEMENTS OF THE EXISTING HEATING SYSTEMS TO BE REMOVED. FOR REASONS OF CLARITY, THE DRAWINGS DO NOT SHOW ALL BUILDING SERVICES LOCATED IN THE UNIT & CRAWL SPACE. ALL BUILDING SERVICES AND OTHER UTILITIES NOT AFFECTED BY THIS WORK SHALL REMAIN OPERATIONAL. ANY DAMAGE TO BUILDING SERVICES AND UTILITIES NOT AFFECTED BY THE WORK SHALL BE PROMPTLY REPAIRED BY THE CONTRACTOR, AT NO COST TO THE OWNER.

THE SIZES AND LOCATION OF PIPING, EQUIPMENT AND OTHER UTILITIES INDICATED ON THE DRAWINGS WERE SITE MEASURED. MAKE ANY CHANGES REQUIRED TO SUIT THE ACTUAL SITE CONDITIONS AT NO COST TO THE OWNER.

REMOVE EXISTING HEATING RADIATORS, CAP THE PIPES BELOW FLOOR LEVEL. ABANDON ALL PIPES IN CRAWL SPACE.

COORDINATE WITH REPRESENTATIVE UTILITIES SHUT–DOWN TIMING.

THE DEMOLITION WORK SHALL INCLUDE THE TEMPORARY OR PERMANENT RELOCATION OF ANY EXISTING BUILDING SERVICES OR ARCHITECTURAL ELEMENTS NOT SPECIFICALLY MENTIONED HEREIN BUT OBVIOUSLY NECESSARY FOR THE INSTALLATION OF THE NEW EQUIPMENT (SUCH AS, DRAINS, SANITARY VENTS, LIGHTING FIXTURES, CONDUITS, JUNCTION BOXES AND SIMILAR). AT THE CONCLUSION OF THE WORK, ALL BUILDING SERVICES AND ARCHITECTURAL ELEMENTS TEMPORARILY REMOVED SHALL BE REINSTATED AND MADE GOOD TO THEIR ORIGINAL CONDITION.

REVISION NO.

No.	DATE	DESCRIPTION
1.	18/07/2024	ISSUED FOR PERMIT & TENDE

THE CONTRACTOR MUST VERIFY ALL DIMENSIONS ON AND REPORT ANY DISCREPANCIES TO THE ENGINEER BEFORE PROCEEDING WITH THE WORK.

DO NOT SCALE DRAWINGS.

SEAL

LICENSED PROFESSIONAL ENGINEER
18/ 7/ 2024
G. STRASHUN
PROVINCE OF ONTARIO

NORTH | TRUE NORTH

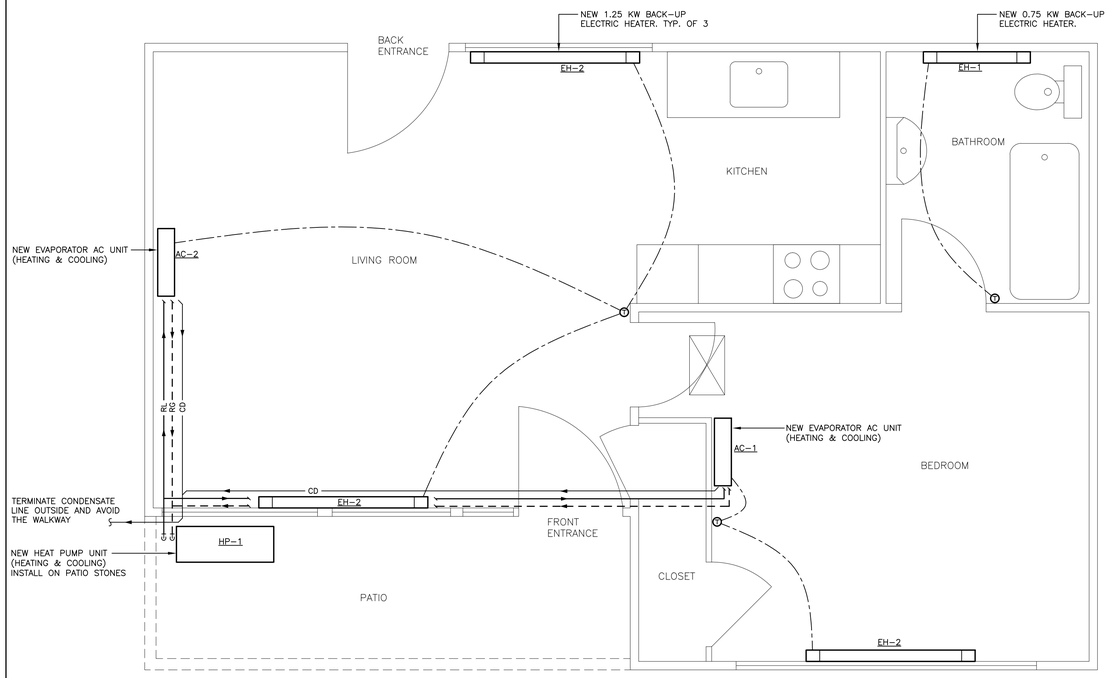
CONSULTANT

SAB ENGINEERING Inc.
588 EDWARD AVE., UNIT 25, RICHMOND HILL, ONT., L4C 9Y6
TEL. (905)-787 8885 FAX (905)-787 8771

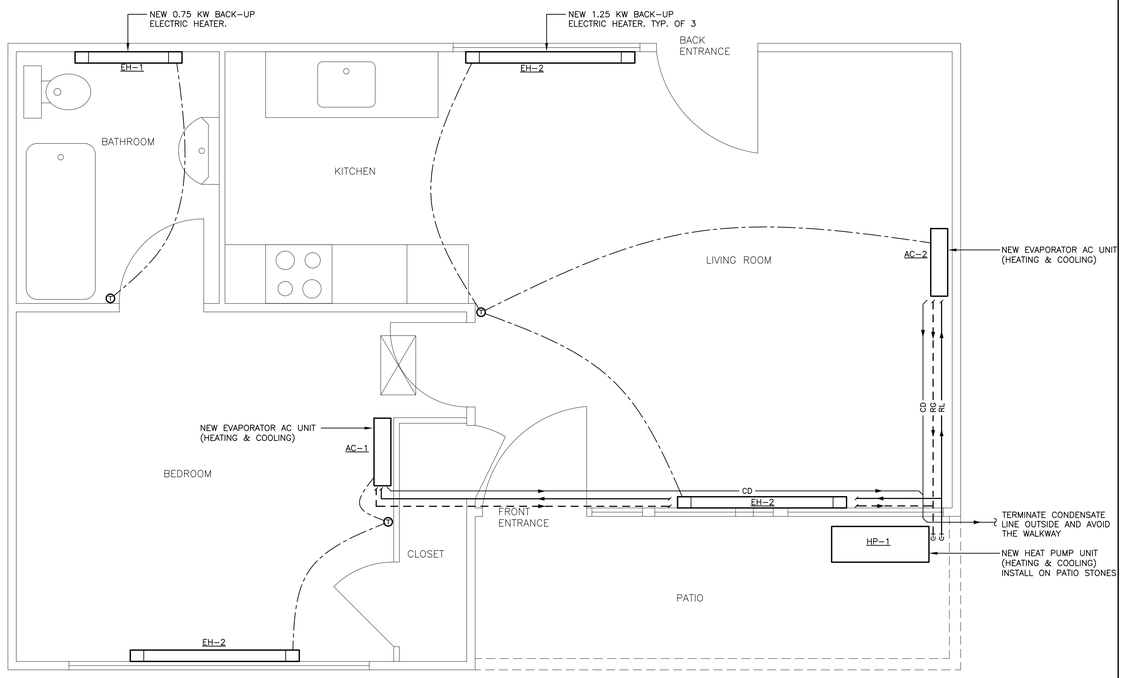
PROJECT
SERVICE UPGRADES
WOODSIDE DR. & SEDGEWICK CRES
OAKVILLE, ONTARIO L6L 4K9

DRAWING TITLE
TYPICAL SUITE LAYOUT – EXISTING & DEMOLITION WORKS – MECHANICAL

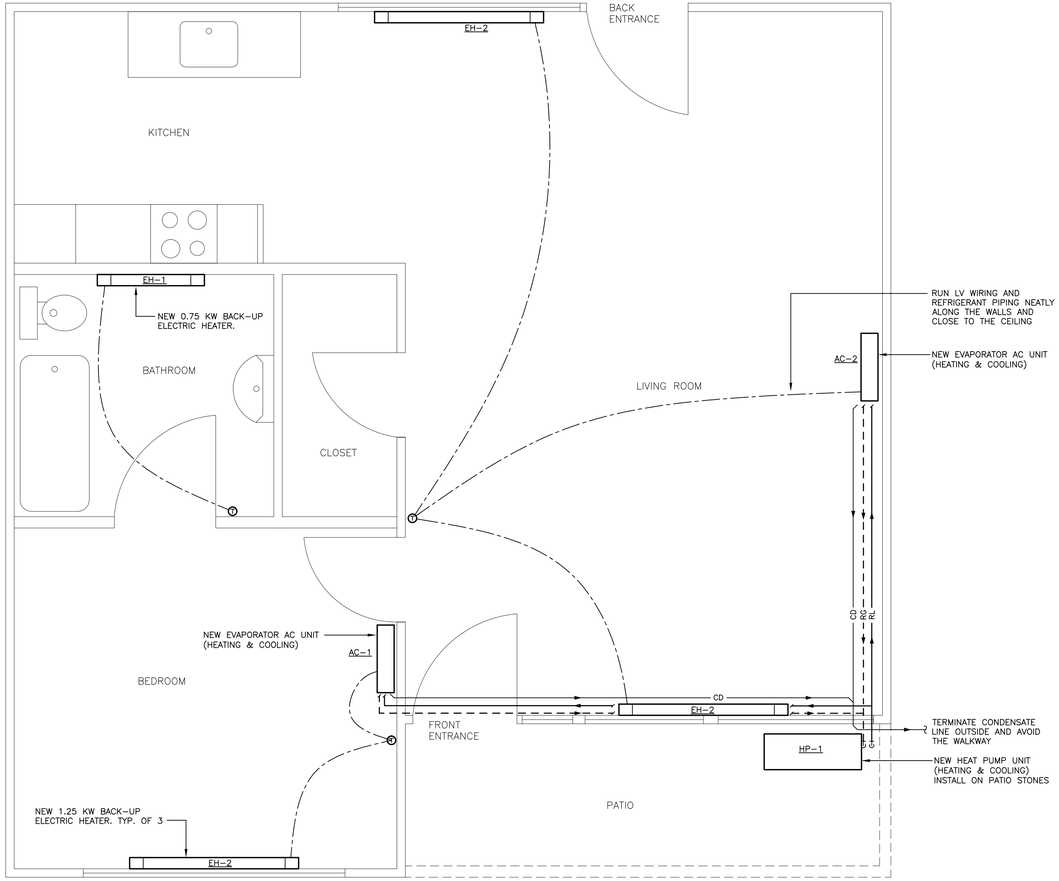
DATE	SCALE
APR. 24	1:25
DRAWN BY: T.N.	DWG. No. M–3
JOB No. 2024–35	



TYPICAL SUITE (PATIO ON THE LEFT OF FRONT ENTRANCE) – NEW WORKS
SCALE: 1:25



TYPICAL SUITE (PATIO ON THE RIGHT OF FRONT ENTRANCE) – NEW WORKS
SCALE: 1:25



TYPICAL SUITE (#252, 254, 256, 258) – NEW WORKS
SCALE: 1:25

NEW WORK NOTES:

FOR REASONS OF CLARITY, THE ROOM LAYOUT DOES NOT SHOW ALL VALVES, FITTINGS AND SENSORS/GAUGES.

THE DRAWINGS DO NOT SHOW ALL STRUCTURAL ELEMENTS AND BUILDING SERVICES LOCATED IN THE FAN ROOM.

ALL TEMPORARY INTERRUPTION OF SERVICES SHALL BE COORDINATED WITH THE OWNER.

MAKE ALL NECESSARY REFRIGERANT LINES CONNECTIONS BETWEEN THE INDOOR EVAPORATORS AND OUTDOOR CONDENSER. FINAL ROUTINE & SIZE OF REFRIGERANT TO BE DETERMINED BY MANUFACTURER.

ALL ENVELOPE PENETRATIONS OF THE REFRIGERANT LINES THROUGH THE WALLS SHALL BE SEALED AND FIRE STOPPED.

PROVIDE ALL REQUIRED POWER AND CONTROL WIRE BETWEEN INDOOR & OUTDOOR UNITS INCLUDING THERMOSTAT AND CONTROLLER.

EQUIPMENT MANUFACTURER AND ELECTRICAL CONTRACTOR SHALL COORDINATE TO SUPPLY AND INSTALL LOCAL DISCONNECTS FOR THE INDOOR EVAPORATORS AND OUTDOOR CONDENSER.

EXACT LOCATION OF NEW HEAT PUMP UNITS AT GRADE LEVEL TO BE ESTABLISHED ON SITE AND COORDINATED WITH BUILDING DRAINS AND LANDSCAPE FEATURES. MAINTAIN CLEARANCES BETWEEN THE CONDENSING UNITS AND THE BUILDING WALLS IN ACCORDANCE WITH THE MANUFACTURER'S INSTRUCTIONS.

NEW HEAT PUMP UNITS ARE TO BE INSTALLED ON NEW PATIO STONES FOR SUPPORT.

SECURE NEW CONDENSING UNITS TO THE CONCRETE PADS; INSTALL WIND PROTECTIVE BAFFLES MANUFACTURED AND SUPPLIED BY THE MANUFACTURER.

ALL REFRIGERANT SUCTION LINES SHALL BE FULLY INSULATED AND PROTECTED BY AN ALUMINUM JACKET OUTDOORS.

CONNECT NEW EQUIPMENT TO POWER SOURCE (REFER TO ELECTRICAL DRAWINGS).

PROVIDE NEW CONCRETE PAD TO MATCH THE SIZE OF THE NEW UNIT.

PROVIDE ALL REQUIRED SUPPORTS FOR THE NEW DUCTWORK AND PIPES, INCLUDING HANGERS, FLOOR OR WALL SUPPORTS.

MAKE GOOD ALL SURFACES AFFECTED BY THE WORK. PATCH AND PAINT THE WALL TO MATCH EXISTING.

RE-INSTATE ALL THE LIGHTS, ELECTRICAL DEVICES, WIRING OR LIGHTS AND ANY OTHER SERVICES THAT HAVE BEEN TEMPORARY REMOVED TO ALLOW FOR THE INSTALLATION OF THE NEW EQUIPMENT.

REVISION NO.

No.	DATE	DESCRIPTION
1.	18/07/2024	ISSUED FOR PERMIT & TENDE

THE CONTRACTOR MUST VERIFY ALL DIMENSIONS ON AND REPORT ANY DISCREPANCIES TO THE ENGINEER BEFORE PROCEEDING WITH THE WORK.

DO NOT SCALE DRAWINGS.

SEAL

LICENSED PROFESSIONAL ENGINEER
18/7/2024
G. STRASHUN
PROVINCE OF ONTARIO

NORTH | TRUE NORTH

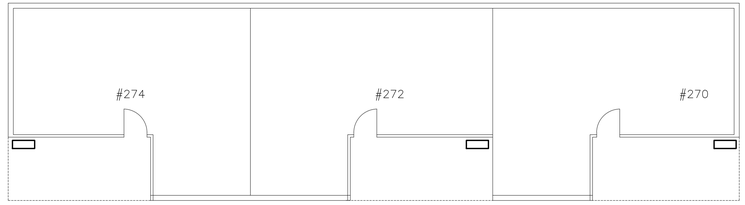
CONSULTANT

SAB ENGINEERING Inc.
588 EDWARD AVE., UNIT 25, RICHMOND HILL, ONT., L4C 9Y6
TEL. (905)-787 8885 FAX (905)-787 8771

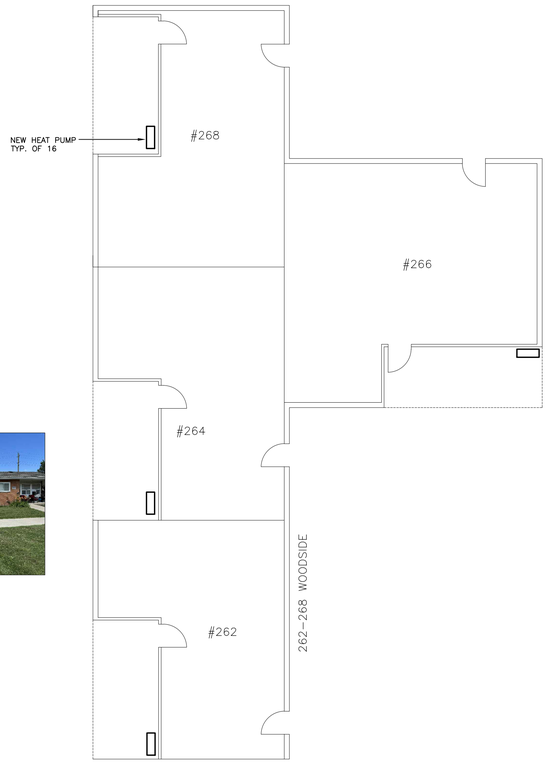
PROJECT
SERVICE UPGRADES
WOODSIDE DR. & SEDGEWICK CRES
OAKVILLE, ONTARIO L6L 4K9

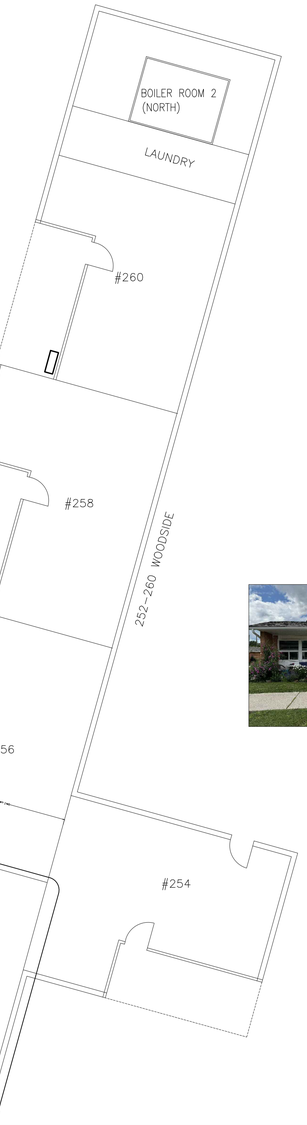
DRAWING TITLE
TYPICAL SUITE LAYOUT – NEW WORKS – MECHANICAL

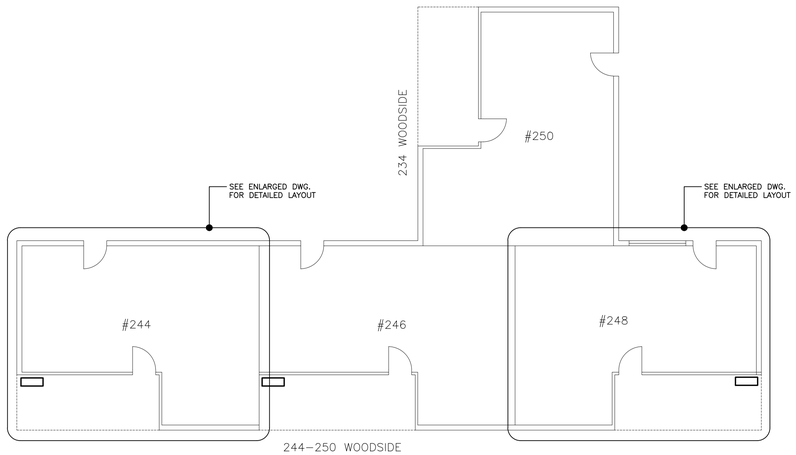
DATE	SCALE
APR. 24	1:25
DRAWN BY: T.N.	DWG. No. M – 4
JOB No. 2024–35	

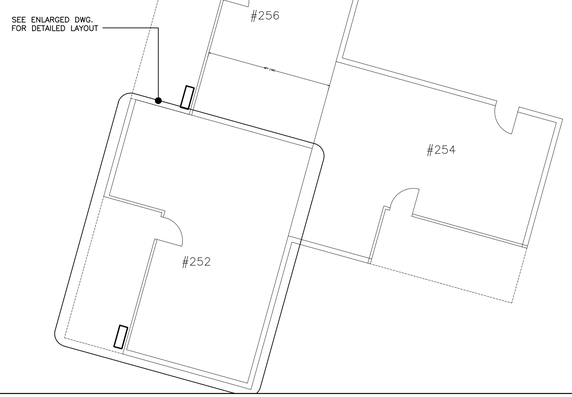


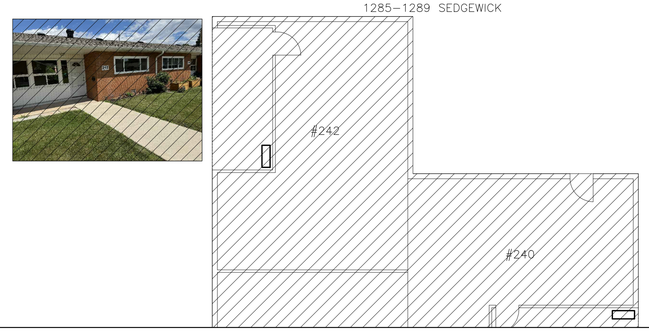
274–270 WOODSIDE











WOODSIDE

REVISION NO.

No.	DATE	DESCRIPTION
1.	18/07/2024	ISSUED FOR PERMIT & TENDE

THE CONTRACTOR MUST VERIFY ALL DIMENSIONS ON AND REPORT ANY DISCREPANCIES TO THE ENGINEER BEFORE PROCEEDING WITH THE WORK.

DO NOT SCALE DRAWINGS.

SEAL

LICENSED PROFESSIONAL ENGINEER
18/07/2024
G. STRASHUN
PROVINCE OF ONTARIO

NORTH

TRUE NORTH

CONSULTANT

SAB ENGINEERING Inc.
588 EDWARD AVE., UNIT 25, RICHMOND HILL, ONT., L4C 9Y6
TEL. (905)-787 8885 FAX (905)-787 8771

PROJECT

SERVICE UPGRADES
WOODSIDE DR. & SEDGEWICK CRES
OAKVILLE, ONTARIO L6L 4K9

DRAWING TITLE

NORTH BLOCK – NEW WORK – MECHANICAL

DATE	SCALE
APR. 24	N.T.S.
DRAWN BY: T.N.	DWG. No. M–5
JOB No. 2024–35	

#254

#252

1285–1289 SEDGEWICK

#242

#240

#238

LAUNDRY

BOILER ROOM 1
(SOUTH)

236–242 WOODSIDE

#236

WOODSIDE

LAUNDRY

#1299

#1293

NEW HEAT PUMP
TYP. OF 12

#1297

12931–1299 SEDGEWICK

#1295

234 WOODSIDE

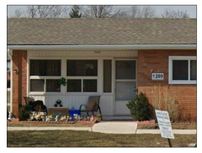
#234

#1289

#1287

#1285

1285–1289 SEDGEWICK



SEDGEWICK

REVISION NO.

No.	DATE	DESCRIPTION
1.	18/07/2024	ISSUED FOR PERMIT & TENDE

THE CONTRACTOR MUST VERIFY ALL DIMENSIONS ON AND REPORT ANY DISCREPANCIES TO THE ENGINEER BEFORE PROCEEDING WITH THE WORK.

DO NOT SCALE DRAWINGS.

SEAL

LICENSED PROFESSIONAL ENGINEER
July 2024
G. STRASHUN
PROVINCE OF ONTARIO

NORTH | TRUE NORTH

CONSULTANT

SAB ENGINEERING Inc.

588 EDWARD AVE., UNIT 25, RICHMOND HILL, ONT., L4C 9Y6
TEL. (905)-787 8885 FAX (905)-787 8771

PROJECT

SERVICE UPGRADES
WOODSIDE DR. & SEDGEWICK CRES
OAKVILLE, ONTARIO L6L 4K9

DRAWING TITLE

SOUTH BLOCKS – NEW WORK – MECHANICAL

DATE	SCALE
APR. 24	N.T.S.
DRAWN BY: T.N.	DWG. No. M–6
JOB No. 2024–35	

BUILDING ELECTRICAL SERVICE SIZE CALCULATION BASED ON RULE 8-202 OF OESC.

1.	BASIC LOAD FOR EACH RESIDENTIAL SUITE	5,000 W
2.	MAXIMUM HEATING LOAD FOR EACH SUITE	9,000W
3.	ELECTRIC RANGE	6,000 W
4.	HOUSE PANEL	10,000 W
5.	FUTURE ELECTRIC HOT WATER TANK	75,000 W

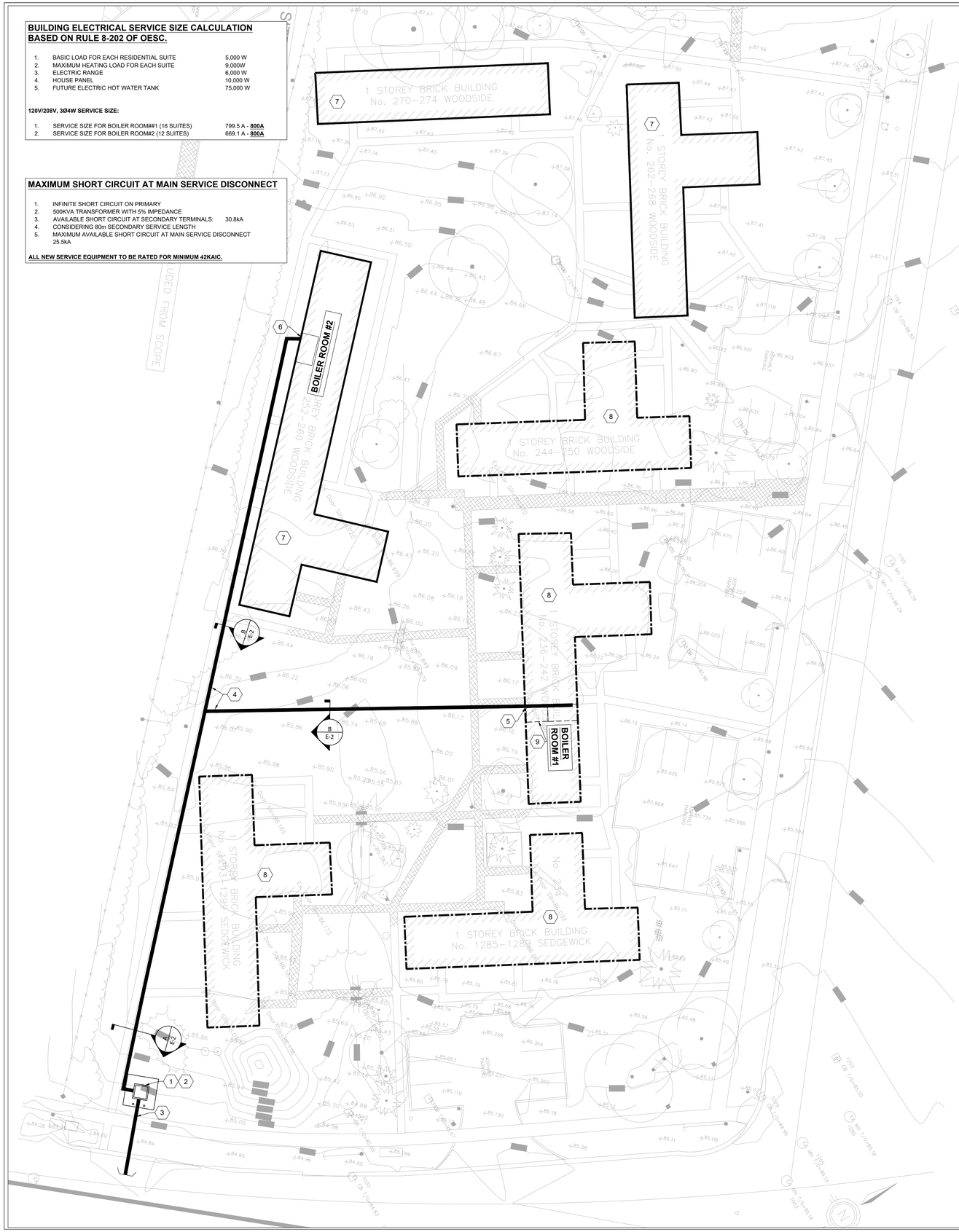
120V/208V, 3Ø4W SERVICE SIZE:

1.	SERVICE SIZE FOR BOILER ROOM#1 (16 SUITES)	799.5 A - **800A**
2.	SERVICE SIZE FOR BOILER ROOM#2 (12 SUITES)	669.1 A - **800A**

MAXIMUM SHORT CIRCUIT AT MAIN SERVICE DISCONNECT

1. INFINITE SHORT CIRCUIT ON PRIMARY
2. 500KVA TRANSFORMER WITH 5% IMPEDANCE
3. AVAILABLE SHORT CIRCUIT AT SECONDARY TERMINALS: 30.8kA
4. CONSIDERING 80m SECONDARY SERVICE LENGTH
5. MAXIMUM AVAILABLE SHORT CIRCUIT AT MAIN SERVICE DISCONNECT 25.5kA

ALL NEW SERVICE EQUIPMENT TO BE RATED FOR MINIMUM 42KAIC.



DESIGN NOTES:

1. PROPOSED LOCATION FOR NEW PAD-MOUNTED TRANSFORMER SUPPLIED AND INSTALLED BY OAKVILLE HYDRO. EXACT LOCATION AND ORIENTATION TO BE CONFIRMED BY OAKVILLE HYDRO PRIOR TO CONSTRUCTION.
2. OAKVILLE HYDRO TO PROVIDE GROUNDING, GUARD POSTS AND FOUNDATION FOR THE NEW TRANSFORMER.
3. PRIMARY DUCT BANKS TO BE PROVIDED AND INSTALLED BY OAKVILLE HYDRO.
4. SECONDARY SERVICE DUCT BANK TO BE PROVIDED AND INSTALLED BY ELECTRICAL CONTRACTOR. EXISTING UNDERGROUND SERVICES TO BE LOCATED PRIOR TO THE CONSTRUCTION. INCLUDE COST FOR A COMPLETE LOCATE SERVICE THAT SHOWS PATH AND DEPTH OF THE EXISTING UNDERGROUND SERVICES. CONTRACTOR TO COORDINATE WITH UTILITIES FOR RELOCATION AND DISCONNECTION OF ANY UNDERGROUND SERVICES. ALL SURFACES TO BE RETURNED TO THE PRE-CONSTRUCTION CONDITION. EXACT DUCT BANK ROUTE TO BE DETERMINED ON SITE ACCORDING TO THE LOCATE PLAN PROVIDED BY THE CONTRACTOR.
5. PROVIDE TRANSITION FROM UNDERGROUND DUCT BANK TO A VERTICAL RUN RIGID GALVANIZED STEEL CONDUITS SUPPORTED ON THE EXTERIOR WALL. EXTEND THE CONDUITS AND CONDUCTORS TO THE BOILER ROOM THROUGH THE LAUNDRY ROOM.
6. PROVIDE TRANSITION FROM UNDERGROUND DUCT BANK TO A VERTICAL RUN RIGID GALVANIZED STEEL CONDUITS SUPPORTED ON THE EXTERIOR WALL.
7. PROVIDE FEEDER FOR THE NEW EXTERIOR PANELS FROM THE PANEL 'DP-2'. REFER TO THE SLD FOR MORE DETAILS. EXACT MOUNTING LOCATION AND FEEDER PATH TO BE DETERMINED ON SITE ACCORDANCE TO THE NEW HEAT PUMP AND UNDERGROUND SERVICE LOCATIONS.
8. PROVIDE FEEDER FOR THE NEW EXTERIOR PANELS FROM THE PANEL 'DP-1'. REFER TO THE SLD FOR MORE DETAILS. EXACT MOUNTING LOCATION AND FEEDER PATH TO BE DETERMINED ON SITE ACCORDANCE TO THE NEW HEAT PUMP AND UNDERGROUND SERVICE LOCATIONS.
9. INCLUDE ALL COSTS RELATED TO RELOCATION AND TEMPORARY REMOVAL/RE-INSTALLATION OF THE EXISTING EQUIPMENT AS NEEDED FOR THE NEW CONDUIT RUN INSTALLATION WITHIN THE LAUNDRY ROOM. PAINT, REPAIR, AND PATCH ANY DAMAGE TO WALLS AND CEILINGS CAUSED DURING CONSTRUCTION.

SITE WORK NOTES:

1. ALL SURFACES MUST BE RETURNED TO THEIR PRE-CONSTRUCTION CONDITION. THIS INCLUDES: CONCRETE PAVERS, LAWNS, PLANTS AND OTHER SITE AND LANDSCAPE ELEMENTS.
2. TRY TO AVOID RUNNING TRENCHES IN PLANTED AREAS. ALLOW FOR TEMPORARY REMOVAL OF THE PLANTS AND RE-PLANTING THEM.
3. PROVIDE A MARKUP SHOWING THE PROPOSED TRENCH PATH AND ALL ANY IMPACTED SITE ITEM.
4. COORDINATE WITH THE CLIENT AND ENSURE THAT CONSTRUCTION WORK DOES NOT BLOCK THE TENANTS ACCESS TO THEIR UNITS.

ELECTRICAL CONTRACTOR IS RESPONSIBLE FOR ALL COORDINATION WITH OAKVILLE HYDRO FOR NEW SERVICE INSTALLATION, REQUESTS FOR DISCONNECT AND TEMPORARY SERVICE.

ABATEMENT WORK:

THERE ARE ASBESTOS-CONTAINING MATERIALS PRESENT IN THE BUILDING. THE CONTRACTOR MUST CAREFULLY REVIEW THE DSS REPORT AND COORDINATE ALL WORK WITH THE DESIGNATED ABATEMENT CONTRACTOR. ANY ACTIVITIES THAT MAY DISTURB THE ASBESTOS MATERIALS MUST BE CARRIED OUT BY A QUALIFIED ABATEMENT CONTRACTOR.

BUILDING PERIMETER LINE TYPE	NEW 'HP-XXXX' SOURCE
——·—·——	DP-1
————	DP-2

GENERAL NOTES

1.1. PROVIDE ALL MATERIAL, EQUIPMENT AND LABOR REQUIRED TO CONSTRUCT, INSTALL, TEST AND COMPLETE A FULLY FUNCTIONING ELECTRICAL SYSTEM AS SHOWN ON THE DRAWINGS / SPECIFICATIONS. INCLUDE ALL ITEMS NECESSARY TO COMPLY WITH CODES AND AUTHORITIES HAVING JURISDICTION.

1.2. VISIT AND EXAMINE THE SITE CONDITIONS WHERE THE WORK IS TO BE DONE. REVIEW OTHER TRADES DRAWINGS AND SPECIFICATIONS AND INCLUDE THE COST ASSOCIATED WITH RELOCATING OR REROUTING OF THE ELECTRICAL EQUIPMENT. THERE WILL BE NO CONSIDERATION FOR EXTRAS FOR FAILURE TO COMPLY WITH THIS ITEM.

1.3. DEFINITIONS:
1.3.1. "PROVIDE": SUPPLY, INSTALL AND CONNECT
1.3.2. "INSTALL": INSTALL AND CONNECT

1.4. ALL WORK MUST BE PERFORMED IN ACCORDANCE WITH THE LATEST APPLICABLE ONTARIO BUILDING CODE AND CSA STANDARD C22.1—21 ONTARIO ELECTRICAL CODE, AND AHJ'S ADDITIONAL REQUIREMENTS OR INSTRUCTIONS.

1.5. THE CONTRACTOR IS RESPONSIBLE FOR OBTAINING AND PAYING FOR ALL PERMITS AND INSPECTIONS IN CONNECTION WITH THE WORK PRIOR TO STARTING THE WORK.

1.6. CARRY COSTS WITHIN BID FOR ALL BUILDING SHUTDOWNS TO BE DURING PREMIUM TIME. CONFIRM THE NORMAL OPERATION OF THE BUILDING AND OTHER EXISTING TENANTS WITH THE BUILDING OWNER. SHUTDOWN TIME AND DURATION SHALL BE CONFIRMED BY OWNER.

1.7. ALL CHANGE REQUESTS SHALL BE WITH ITEMIZED LABOUR AND MATERIAL BREAKDOWN.

1.8. ENSURE THAT ALL FLOOR PENETRATIONS AND SAW CUTTING IS APPROVED BY THE ARCHITECT, BUILDING OWNER AND STRUCTURAL ENGINEER PRIOR TO ANY CUTTING. PATCHING SHALL BY DONE BY THIS CONTRACTOR AND AS PER STRUCTURAL ENGINEER'S INSTRUCTIONS.

1.9. ALL MATERIALS AND EQUIPMENT SHALL BE NEW, C.S.A. CERTIFIED AND MANUFACTURED TO THE STANDARDS SPECIFIED.

1.10. WHERE THERE IS NO ALTERNATIVE TO SUPPLYING EQUIPMENT THAT IS NOT C.S.A. CERTIFIED, OBTAIN SPECIAL APPROVAL FROM THE LOCAL INSPECTION DEPARTMENT.

1.11. SUBMIT TO THE LOCAL ELECTRICAL INSPECTION DEPARTMENT, THE NECESSARY NUMBER OF DOCUMENTS FOR EXAMINATION, SPECIAL INSPECTION AND APPROVAL, PRIOR TO THE COMMENCEMENT OF THE WORK, AND PAY ALL COSTS AND ASSOCIATED FEES.

1.12. THE DRAWINGS FOR THE ELECTRICAL WORK ARE DIAGRAMMATIC PERFORMANCE DRAWINGS ONLY, INTENDED TO CONVEY THE SCOPE OF WORK AND INDICATE THE GENERAL ARRANGEMENT AND APPROXIMATE LOCATION OF ELECTRICAL EQUIPMENT. THE DRAWINGS DO NOT INTEND TO SHOW ARCHITECTURAL, INTERIOR DESIGN, MECHANICAL, STRUCTURAL OR BASE BUILDING DETAILS. CONTRACTOR SHALL BE RESPONSIBLE FOR A THOROUGH KNOWLEDGE OF SAME PRIOR TO PROCEEDING WITH THE WORK.

1.13. ANY DISCREPANCIES BETWEEN DRAWINGS AND/OR SPECIFICATIONS AND EXISTING CONDITIONS MUST BE REFERRED TO THE DESIGN CONSULTANT/ARCHITECT PRIOR TO ANY WORK.

1.14. MAKE, AT NO ADDITIONAL COST, ANY CHANGES OR ADDITIONS TO MATERIALS AND EQUIPMENT NECESSARY TO ACCOMMODATE STRUCTURAL CONDITIONS (OFFSETS AROUND BEAMS, COLUMNS, ETC.)

1.15. ACCESS PANELS MUST BE REVIEWED AND APPROVED BY OWNER PRIOR TO CLOSING CEILINGS.

2. BASE BUILDING REQUIREMENTS

2.0. CONTRACTOR MUST FOLLOW BASE BUILDING REQUIREMENTS AND TENANT IMPROVEMENT GUIDELINES PROVIDED DURING THE TENDER.

2.1. WHEN DELETING AND/OR MAKING SAFE EXISTING ELECTRICAL WORK, ENSURE THAT ALL DISCONNECTED WIRING IS CAPPED OFF.

2.2. EXISTING DEVICES DESIGNATED TO BE RELOCATED/REUSED SHALL BE INSPECTED AND REFURBISHED TO ENSURE CORRECT OPERATION WHEN PUT BACK INTO SERVICE AND MEETS ELECTRIC SAFETY INSPECTOR'S APPROVAL. OUTLET BOXES AND WIRING AND/OR CONDUITS THAT ARE CORRODED OR DAMAGED ARE TO BE REPLACED.

2.3. ALL EXISTING ELECTRICAL EQUIPMENT WHICH ARE NO LONGER REQUIRED SHALL BE REMOVED AND DISPOSED OF, OFF-SITE.

2.4. CONDUITS THAT ARE TO BE CUT BACK ARE TO TERMINATE IN A JUNCTION BOX.

2.5. CLEAN LUMINAIRE REFLECTORS AND LENSES, LAMPS, AND OTHER SURFACES THAT HAVE BEEN EXPOSED TO CONSTRUCTION DUST AND DIRT. CLEAN THE INSIDES AND OUTSIDES OF PANELBOARDS, SPLITTERS AND OTHER ELECTRICAL EQUIPMENT.

3. WORKMANSHIP

3.1. WORK SHALL BE PERFORMED BY LICENSED TRADESMEN SKILLED IN THE WORK TO BE PERFORMED. ONLY FIRST-CLASS WORKMANSHIP WILL BE ACCEPTED WITH RESPECT TO SAFETY, ACCESSIBILITY, DURABILITY, NEATNESS OF DETAIL, AND APPEARANCE.

3.2. ANY DAMAGE CAUSED TO THE PROPERTY OF THE OWNER THROUGH POOR WORKMANSHIP IS THE RESPONSIBILITY OF THE CONTRACTOR AND SHALL PAY FOR THE REPAIR OF SAME, WITHOUT EXPENSE TO THE OWNER.

4. CLEAN UP

4.1. CONSTRUCTION SITE SHALL BE KEPT CLEAN AND FREE FROM DEBRIS DURING THE DURATION OF THE PROJECT. CLEAN UP REFUSE, CAUSED BY ELECTRICAL WORK, DAILY FROM THE SITE, DISPOSE OF REFUSE AS DIRECTED BY THE GENERAL CONTRACTOR OR OWNER.

4.2. AFTER SUBSTANTIAL COMPLETION, REMOVE FROM THE PREMISES ALL SURPLUS AND WASTE MATERIAL AND DEBRIS. LEAVE THE SITE AND BUILDING IN CLEAN CONDITION.

5. TEMPORARY POWER

5.1. ELECTRICAL CONTRACTOR IS RESPONSIBLE TO CO-ORDINATE WITH OTHER TRADES AND OWNER TO PROVIDE TEMPORARY POWER C/W CORDS AND TEMP DISTRIBUTION SYSTEM AS REQUIRED DUE TO NEW CONSTRUCTION OR CONTINUITY OF SERVICE IN THE BASE BUILDING.

5.2. ELECTRICAL CONTRACTOR IS RESPONSIBLE TO COORDINATE WITH HYDRO FOR TEMPORARY SERVICE CONNECTION IF NEEDED DURING THE SERVICE UPGRADE OR AS REQUESTED BY THE CLIENT.

6. CUTTING AND PATCHING

6.1. ALL CUTTING AND PATCHING REQUIRED TO THE EXISTING BUILDING STRUCTURE FOR THE ELECTRICAL OPENING SHALL BE INCLUDED UNDER THIS CONTRACT AND BE ACCEPTABLE TO THE OWNER. OBTAIN WRITTEN APPROVAL FROM OWNER PRIOR TO ANY CUTTING IS CARRIED OUT.

6.2. ANY OPENING IN EXISTING STRUCTURE SHALL BE CO-ORDINATED, X-RAYED, CUT OR DRILLED AND PATCHED, AT THE EXPENSE OF THE ELECTRICAL CONTRACTOR, UNLESS OTHERWISE ADVISED BY THE GENERAL CONTRACTOR.

6.3. WHERE CONDUITS OR OTHER ELECTRICAL EQUIPMENT PASS THROUGH FIRE-RATED WALLS OR FLOORS, PROVIDE FIRE-STOPPING MATERIAL LISTED WITH, AND BEAR LABEL OF CSA AND ULC, AND MAINTAIN SAME FIRE RATING OF BUILDING COMPONENT PENETRATION.

7. SHOP DRAWINGS

7.1. SUBMIT SHOP DRAWINGS FOR PANELBOARDS, DISCONNECT SWITCHES, CABLE, DUCT BANK, AND OTHER MAJOR ELECTRICAL EQUIPMENT/SYSTEMS AS REQUESTED BY THE ELECTRICAL ENGINEER FOR APPROVAL.

8. WARRANTY

8.1. CONTRACTOR SHALL PROVIDE A WRITTEN WARRANTY OF ALL MATERIALS, EQUIPMENT AND WORKMANSHIP UNDER THIS DIVISION FOR A PERIOD OF ONE (1) YEAR, COMMENCING ON THE DATE OF SUBSTANTIAL PERFORMANCE OR ACCEPTANCE OF THE COMPLETED PORTION BY THE ARCHITECT/INTERIOR DESIGNER/ PROJECT MANAGER, WHICHEVER DATE IS LATER.

9. AS-BUILT DRAWINGS

- UPON COMPLETION OF WORK, ELECTRICAL CONTRACTOR SHALL PROVIDE THESE (3) SETS OF WHITE PRINTS TO REFLECT 'AS-BUILT' CONDITIONS. 'AS-BUILT' DRAWINGS SHALL INCORPORATE ANY CHANGES OR DEVIATIONS FROM THE TENDER DOCUMENTS.
- CONTRACTOR SHALL ALSO PROVIDE ELECTRONIC FILES IN AUTOCAD FORMAT IN A CD DISK TO REFLECT 'AS-BUILT' CONDITIONS.
- CONTRACTOR TO MARK THE DRAWINGS AS 'AS-BUILT' ALONG WITH ELECTRICAL CONTRACTORS COMPANY NAME.

10. CLOSE-OUT DOCUMENTS

SUBMIT ELECTRONIC COPY AND ONE 3-RING BINDER OF HARD COPY OF THE CLOSEOUT DOCUMENTS WHICH SHALL INCLUDE BUT NOT BE LIMITED TO:

- ESA INSPECTION REPORT AND FINAL CERTIFICATE
- STAMPED APPROVED SHOP DRAWINGS
- WARRANTY LETTER
- AS-BUILT DRAWING (CAD 2004 FILE AND PDF FORMAT)

REVISION NO.

No.	DATE	DESCRIPTION
I.	19/06/2024	ISSUED FOR OAKVILLE HYDRO
II.	28/06/2024	ISSUED FOR ESA PLAN REVIEW
III.	15/07/2024	ISSUED FOR TENDER
IV.	28/06/2024	RE-ISSUED OAKVILLE HYDRO
VI.	23/09/2024	RE-ISSUED FOR TENDER

THE CONTRACTOR MUST VERIFY ALL DIMENSIONS ON AND REPORT ANY DISCREPANCIES TO THE ENGINEER BEFORE PROCEEDING WITH THE WORK.

DO NOT SCALE DRAWINGS.

SEAL

LICENSED PROFESSIONAL ENGINEER
K. NAJAFZADEH
100510929
SEP. 23, 2024
PROVINCE OF ONTARIO

NORTH | TRUE NORTH

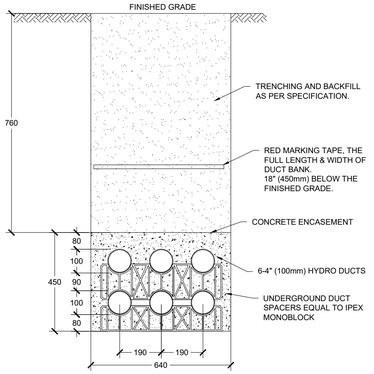
CONSULTANT

SAB ENGINEERING Inc.
588 EDWARD AVE., UNIT 25, RICHMOND HILL, ONT., L4C 9Y6
TEL. (905)-787 8885 FAX (905)-787 8771

PROJECT
H.V.A.C. & POWER UPGRADES
WOODSIDE DR. & SEDGEWICK CRES
OAKVILLE, ONTARIO L6L 4K9

DRAWING TITLE
ELECTRICAL SITE PLAN

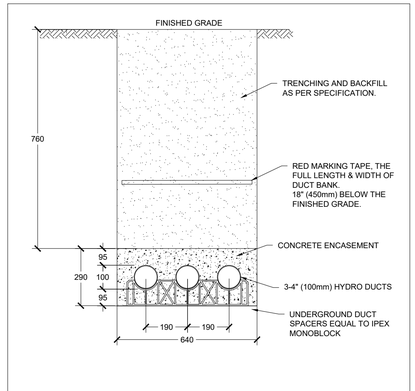
DATE	SCALE
JUN. 24	1:250
DRAWN BY: K.N.	DWG. No. E-1
JOB No. 2024–35	



1. ENCASE DUCTS IN 20 MPa CONCRETE ON 1/2" (13mm) PEA GRAVEL.
2. SLOPE DUCT BANK A MINIMUM OF 3" (75mm) PER 100' (30.5M) (AWAY FROM BUILDING).
3. CONCRETE ENCASED DUCTS SHALL BE CSA APPROVED PVC TYPE II.
4. PROVIDE 1-3/16" (4.75mm) MIN. POLYPROPYLENE FISH ROPE IN EACH CONCRETE ENCASED OR DIRECT BURIED DUCT. SEAL DUCT ENDS WITH AN APPROVED DUCT PLUG.

EXACT CONSTRUCTION DETAILS SHALL CONFORM TO LOCAL UTILITY REQUIREMENTS AND DETAILS.

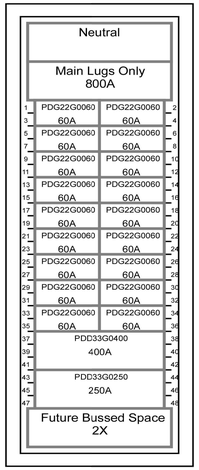
SECTION 'A' – SECONDARY DUCT BANK
SCALE: NTS



1. ENCASE DUCTS IN 20 MPa CONCRETE ON 1/2" (13mm) PEA GRAVEL.
2. SLOPE DUCT BANK A MINIMUM OF 3" (75mm) PER 100' (30.5M) (AWAY FROM BUILDING).
3. CONCRETE ENCASED DUCTS SHALL BE CSA APPROVED PVC TYPE II.
4. PROVIDE 1-3/16" (4.75mm) MIN. POLYPROPYLENE FISH ROPE IN EACH CONCRETE ENCASED OR DIRECT BURIED DUCT. SEAL DUCT ENDS WITH AN APPROVED DUCT PLUG.

EXACT CONSTRUCTION DETAILS SHALL CONFORM TO LOCAL UTILITY REQUIREMENTS AND DETAILS.

SECTION 'B' – SECONDARY DUCT BANK
SCALE: NTS



General Information **(Section 1 of 1)**

Service Voltage:	208Y/120V 3Ph 4W	**Enclosure:**	SPRINKLERPROOF
Bus Rating & Type:	800A Silver Plated Copper	**Neutral Rating:**	800A
Ground Bar:	Std. Bolted Aluminum, Al or Cu cable		
S.C. Rating:	42k A.I.C. Fully Rated		
Main Device Type:	Main Lugs Only - Top Cable Entry		
Main Terminals:	Mechanical - (3) #4-500 kcmil (Cu/Al)		
Neutral Terminals:	Mechanical - (3) #4-500 kcmil (Cu/Al)		
Box Catalog No.:	SP2473		
Trim:	Standard Covers Surface Mounted		
Box Dimensions:	73.50" [1866.9mm]H x 24.00" [609.6mm]W x 11.4" [289.6mm]D		
Min. Gutter Size:	Top = 10.625" [269.9mm] Bottom = 10.625" [269.9mm] Left = 5" [127.0mm] Right = 5" [127.0mm]		
Panel ID Nameplate:			
Type:			

CSA

Circuit Directory: Plastic Sleeve with Card
Entry Plate: No Plate
Heat Loss - Watts (Est.) = 352
Wire shall be based on the ampacity of 75°C rated conductors unless otherwise indicated.

Device Modifications:

Ref #	Description

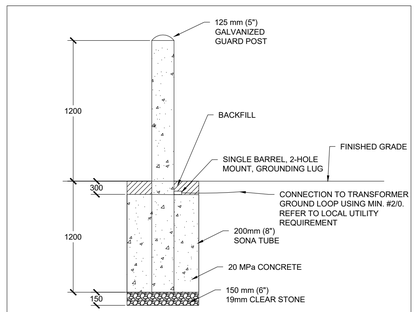
Branch Devices

Qty	Poles	Trip	Frame	Amps	kAIC
1	3	400	Frame 3	400	42
1	3	250	Frame 3	400	42
18	2	60	Frame 2	100	42

Notes:

The information on this document is created by Eaton Corporation. It is disclosed in confidence and it is only to be used for the purpose in which it is supplied.	PREPARED BY: Mohammad Farrokhi	DATE: 2024-06-12	**Eaton**		
	APPROVED BY	DATE	JOB NAME: Oakville Residential Panel		
			DESIGNATION		
	VERSION: 1.0.0.70		TYPE: PRL4X	DRAWING TYPE: Customer Approval	
NEG-ALT Number: BI730612X4K5-0000	REVISION: 0	DWG SIZE: A	G.O.	ITEM	SHEET: 1 of 3

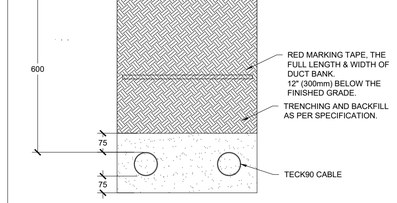
NEW MAIN PANELBOARD SPECIFICATION & LAYOUT
SCALE: NTS



1. NUMBER OF GUARD POSTS AND LOCATIONS SHOWN ARE TYPICAL ARRANGEMENTS. ACTUAL NUMBER OF GUARD POSTS AND LOCATION SHALL BE PROVIDED AS PER LOCAL UTILITY REQUIREMENT.
2. PAINT GUARD POST WITH SAFETY YELLOW PAINT. FOR PROPER ADHESION OF PAINT, GUARD POST SHALL BE CLEANED AND PRIMED PRIOR TO PAINTING. A REFLECTIVE STRIP IF REQUIRED SHALL BE PLACED AT EACH POST.
3. CONTRACTOR TO INSTALL A 300mm CONSTRUCTION JOINT AROUND THE GUARD POSTS EXCEPT IN GRASSY BOULEVARDS.

EXACT CONSTRUCTION DETAILS SHALL CONFORM TO LOCAL UTILITY REQUIREMENTS AND DETAILS.

GUARD POST DETAIL
SCALE: NTS



1. DIRECT BURIED CABLES SHALL BE INSTALLED SO THAT THEY RUN ADJACENT TO EACH OTHER AND DO NOT CROSS OVER EACH OTHER AND WITH A LAYER OF SCREENED SAND WITH A MAXIMUM PARTICLE SIZE OF 4.75 MM OR SCREENED EARTH AT LEAST 75 MM DEEP BOTH ABOVE AND BELOW THE CONDUCTORS.
2. ALL INSTALLATION TO MEET THE REQUIREMENT OF RULE 12-012 OF ONTARIO ELECTRICAL SAFETY CODE.

DIRECT BURIAL CABLE DETAIL
SCALE: NTS

REVISION NO.

No.	DATE	DESCRIPTION
I.	19/06/2024	ISSUED FOR OAKVILLE HYDRO
II.	28/06/2024	ISSUED FOR ESA PLAN REVIEW
III.	15/07/2024	ISSUED FOR TENDER
IV.	28/06/2024	RE-ISSUED OAKVILLE HYDRO
VI.	23/09/2024	RE-ISSUED FOR TENDER

THE CONTRACTOR MUST VERIFY ALL DIMENSIONS ON AND REPORT ANY DISCREPANCIES TO THE ENGINEER BEFORE PROCEEDING WITH THE WORK.

DO NOT SCALE DRAWINGS.

SEAL

LICENSED PROFESSIONAL ENGINEER
K. NAJAFZADEH
100510929
SEP. 23, 2024
PROVINCE OF ONTARIO

NORTH | TRUE NORTH

CONSULTANT

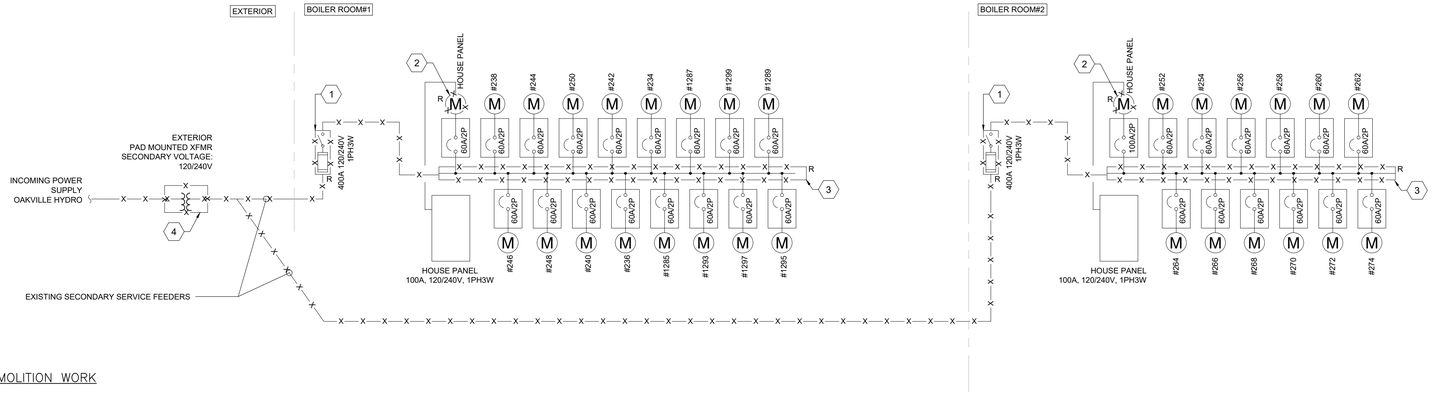
SAB ENGINEERING Inc.
588 EDWARD AVE., UNIT 25, RICHMOND HILL, ONT., L4C 9Y6
TEL. (905)-787 8885 FAX (905)-787 8771

PROJECT
H.V.A.C. & POWER UPGRADES
WOODSIDE DR. & SEDGEWICK CRES
OAKVILLE, ONTARIO L6L 4K9

DRAWING TITLE
ELECTRICAL SERVICES DETAILS

DATE	SCALE
JUN. 24	N.T.S.
DRAWN BY: K.N.	DWG. No. E-2
JOB No.: 2024-35	

SINGLE LINE DIAGRAM	
	CIRCUIT BREAKER
	DRAWOUT CIRCUIT BREAKER
	FUSED SWITCH
	POWER DISTRIBUTION TRANSFORMER
M	METER - METERING CABINET
	AUTOMATIC TRANSFER SWITCH (CIRCUIT BREAKER TYPE)
	AUTOMATIC TRANSFER SWITCH (NON-CIRCUIT BREAKER TYPE)

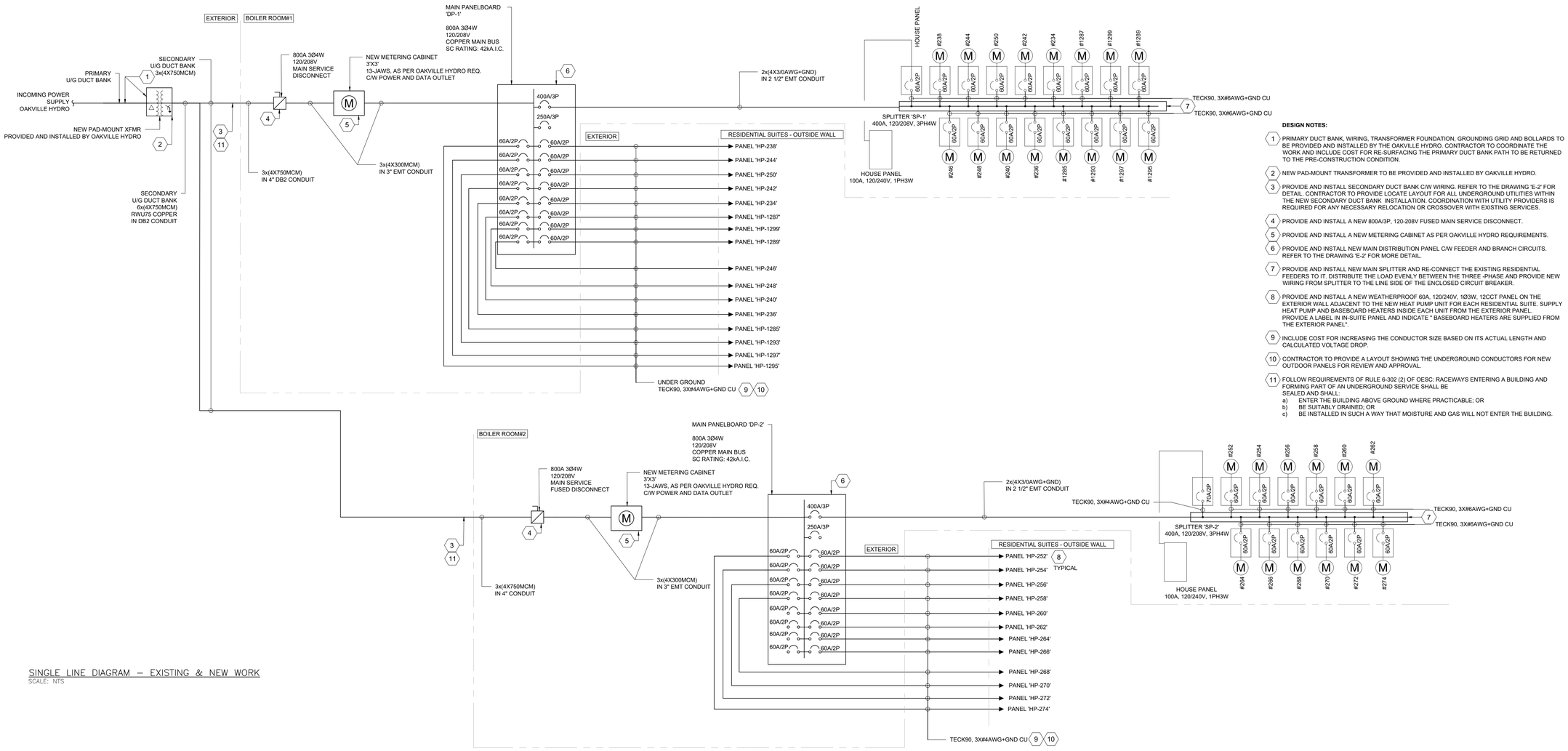


SINGLE LINE DIAGRAM – EXISTING & DEMOLITION WORK

SCALE: NTS

DEMO NOTES:

1. EXISTING MAIN SPLITTER FUSED DISCONNECT SWITCH TO BE REMOVED.
2. COORDINATE WITH HYDRO AND REMOVE THE HOUSE PANEL METER AND RECONNECT THE CIRCUIT TO THE NEW ENCLOSED CIRCUIT BREAKER.
3. EXISTING 400A, 120/240V, 1Ø3W SPLITTER TO BE REMOVED AND REPLACED.
4. EXISTING OAKVILLE HYDRO TRANSFORMER TO BE REMOVED. COORDINATE WITH HYDRO FOR THE TRANSFORMER REMOVAL WORK.



DESIGN NOTES:

1. PRIMARY DUCT BANK, WIRING, TRANSFORMER FOUNDATION, GROUNDING GRID AND BOLLARDS TO BE PROVIDED AND INSTALLED BY THE OAKVILLE HYDRO. CONTRACTOR TO COORDINATE THE WORK AND INCLUDE COST FOR RE-SURFACING THE PRIMARY DUCT BANK PATH TO BE RETURNED TO THE PRE-CONSTRUCTION CONDITION.
2. NEW PAD-MOUNT TRANSFORMER TO BE PROVIDED AND INSTALLED BY OAKVILLE HYDRO.
3. PROVIDE AND INSTALL SECONDARY DUCT BANK C/W WIRING. REFER TO THE DRAWING 'E-2' FOR DETAIL. CONTRACTOR TO PROVIDE LOCATE LAYOUT FOR ALL UNDERGROUND UTILITIES WITHIN THE NEW SECONDARY DUCT BANK INSTALLATION. COORDINATION WITH UTILITY PROVIDERS IS REQUIRED FOR ANY NECESSARY RELOCATION OR CROSSOVER WITH EXISTING SERVICES.
4. PROVIDE AND INSTALL A NEW 800A/3P, 120-208V FUSED MAIN SERVICE DISCONNECT.
5. PROVIDE AND INSTALL A NEW METERING CABINET AS PER OAKVILLE HYDRO REQUIREMENTS.
6. PROVIDE AND INSTALL NEW MAIN DISTRIBUTION PANEL C/W FEEDER AND BRANCH CIRCUITS. REFER TO THE DRAWING 'E-2' FOR MORE DETAIL.
7. PROVIDE AND INSTALL NEW MAIN SPLITTER AND RE-CONNECT THE EXISTING RESIDENTIAL FEEDERS TO IT. DISTRIBUTE THE LOAD EVENLY BETWEEN THE THREE -PHASE AND PROVIDE NEW WIRING FROM SPLITTER TO THE LINE SIDE OF THE ENCLOSED CIRCUIT BREAKER.
8. PROVIDE AND INSTALL A NEW WEATHERPROOF 60A, 120/240V, 1Ø3W, 12CCT PANEL ON THE EXTERIOR WALL ADJACENT TO THE NEW HEAT PUMP UNIT FOR EACH RESIDENTIAL SUITE. SUPPLY HEAT PUMP AND BASEBOARD HEATERS INSIDE EACH UNIT FROM THE EXTERIOR PANEL. PROVIDE A LABEL IN IN-SUITE PANEL AND INDICATE " BASEBOARD HEATERS ARE SUPPLIED FROM THE EXTERIOR PANEL".
9. INCLUDE COST FOR INCREASING THE CONDUCTOR SIZE BASED ON ITS ACTUAL LENGTH AND CALCULATED VOLTAGE DROP.
10. CONTRACTOR TO PROVIDE A LAYOUT SHOWING THE UNDERGROUND CONDUCTORS FOR NEW OUTDOOR PANELS FOR REVIEW AND APPROVAL.
11. FOLLOW REQUIREMENTS OF RULE 6-302 (2) OF OESC: RACEWAYS ENTERING A BUILDING AND FORMING PART OF AN UNDERGROUND SERVICE SHALL BE SEALED AND SHALL:
    a) ENTER THE BUILDING ABOVE GROUND WHERE PRACTICABLE; OR
    b) BE SUITABLY DRAINED; OR
    c) BE INSTALLED IN SUCH A WAY THAT MOISTURE AND GAS WILL NOT ENTER THE BUILDING.

SINGLE LINE DIAGRAM – EXISTING & NEW WORK

SCALE: NTS

REVISION NO.

No.	DATE	DESCRIPTION
I.	19/06/2024	ISSUED FOR OAKVILLE HYDRO
II.	28/06/2024	ISSUED FOR ESA PLAN REVIEW
III.	15/07/2024	ISSUED FOR TENDER
IV.	28/06/2024	RE-ISSUED OAKVILLE HYDRO
VI.	23/09/2024	RE-ISSUED FOR TENDER

THE CONTRACTOR MUST VERIFY ALL DIMENSIONS ON AND REPORT ANY DISCREPANCIES TO THE ENGINEER BEFORE PROCEEDING WITH THE WORK.

DO NOT SCALE DRAWINGS.

SEAL

LICENSED PROFESSIONAL ENGINEER
K. NAJAFZADEH
100510929
SEP. 23, 2024
PROVINCE OF ONTARIO

NORTH | TRUE NORTH

CONSULTANT

SAB ENGINEERING Inc.
588 EDWARD AVE., UNIT 25, RICHMOND HILL, ONT., L4C 9Y6
TEL. (905)-787 8885 FAX (905)-787 8771

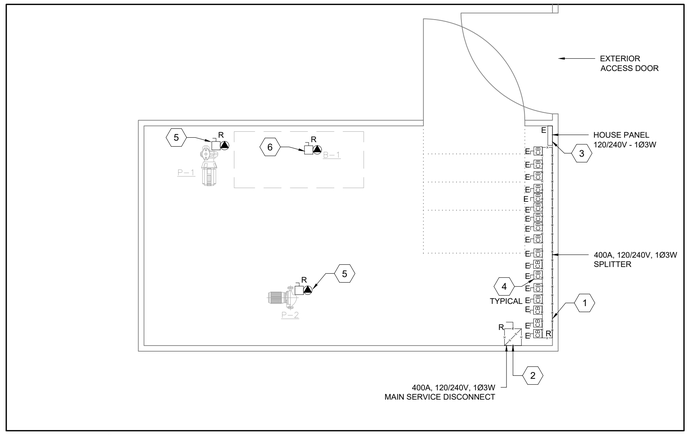
PROJECT

H.V.A.C. & POWER UPGRADES
WOODSIDE DR. & SEDGEWICK CRES
OAKVILLE, ONTARIO L6L 4K9

DRAWING TITLE

ELECTRICAL SERVICES
SINGLE LINE DIAGRAMS

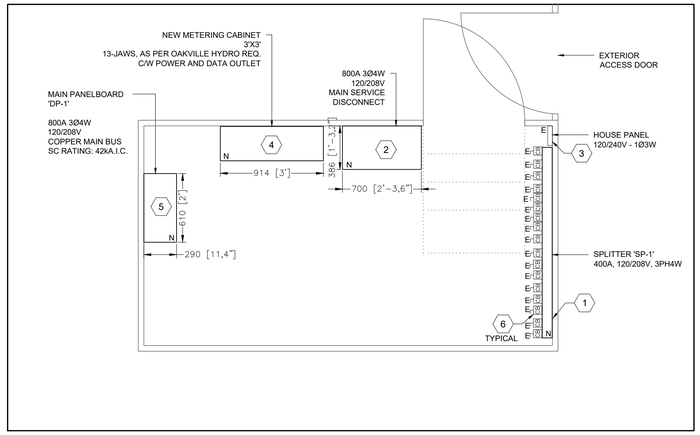
DATE	SCALE
JUN. 24	N.T.S.
DRAWN BY: K.N.	DWG. No.: E-3
JOB No.: 2024-35	



BOILER ROOM #1 POWER LAYOUT – EXISTING & DEMOLITION WORK
SCALE: 1:25

DEMO NOTES:

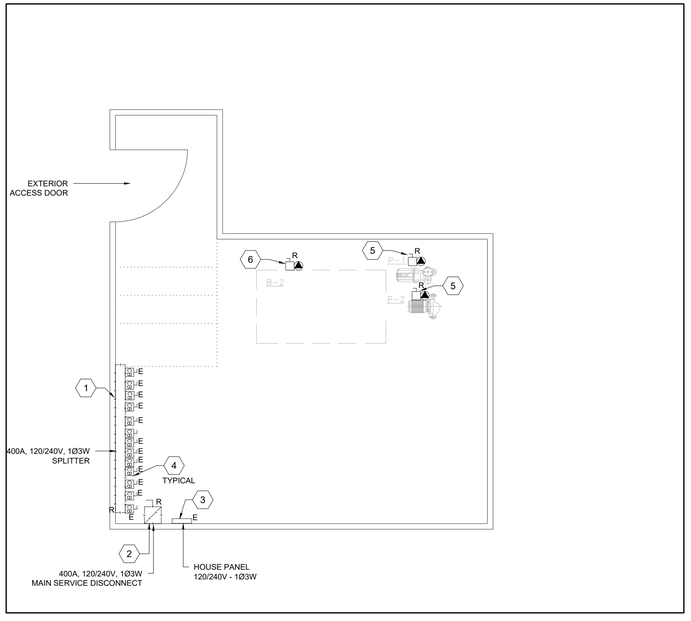
1. EXISTING 400A SPLITTER TO BE REMOVE AND REPLACED BY A NEW 400A, 120/208V, 3Ø4W SPLITTER.
2. EXISTING MAIN SERVICE DISCONNECT TO BE REMOVED C/W WIRING AND CONDUIT.
3. EXISTING HOUSE PANEL TO REMAIN. HOUSE PANEL METER TO BE REMOVED.
4. EXISTING ENCLOSED CIRCUIT BREAKER SERVICE DISCONNECTS TO REMAIN.
5. REMOVE THE DIRECT POWER CONNECTION C/W WIRING AND CONDUIT OF THE EXISTING PUMP.
6. REMOVE THE DIRECT POWER CONNECTION C/W WIRING AND CONDUIT OF THE EXISTING BOILER.



BOILER ROOM #1 POWER LAYOUT – EXISTING & NEW WORK
SCALE: 1:25

DESIGN NOTES:

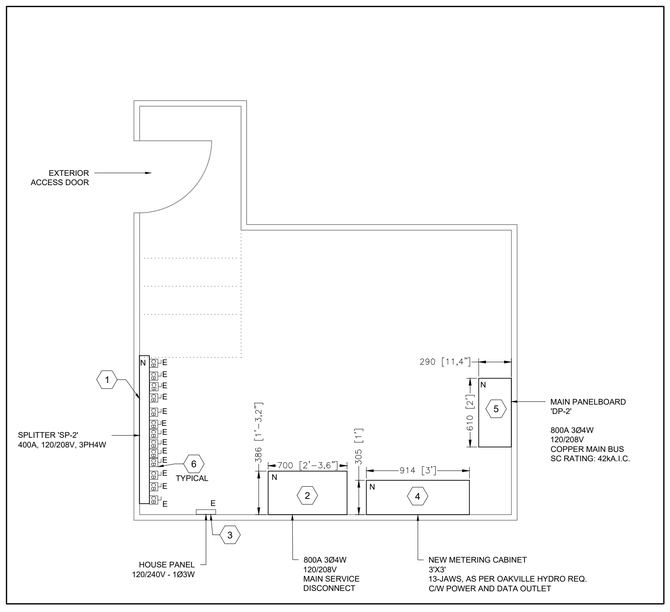
1. PROVIDE AND INSTALL A NEW 400A, 3Ø4W, 120/208V SPLITTER C/W FEEDER AND BRANCH CIRCUITS. REFER TO THE SLD FOR MORE DETAIL.
2. PROVIDE AND INSTALL A NEW 800A, 3Ø4W, 120/208V, FUSED DISCONNECT SWITCH C/W WIRING AND CONDUIT. REFER TO THE SLD FOR MORE DETAIL.
3. EXISTING HOUSE PANEL TO REMAIN. MODIFY THE FEEDER WRING AND CONNECT DIRECTLY TO THE ENCLOSED CIRCUIT BREAKER.
4. PROVIDE AND INSTALL A NEW METERING CABINET C/W 13-JAW METER BASE AS PER OAKVILLE HYDRO REQUIREMENTS.
5. PROVIDE AND INSTALL A NEW 800A, 120/208V, 3Ø4W PANELBOARD AT THE INDICATED LOCATION. REFER TO THE SLD AND DWG. E-2 FOR MORE DETAILS.
6. PROVIDE NEW WIRING AND CONDUIT FROM THE LINE SIDE OF THE ENCLOSED CIRCUIT BREAKERS TO THE NEW SPLITTER TERMINAL BLOCKS.



BOILER ROOM #2 POWER LAYOUT – EXISTING & DEMOLITION WORK
SCALE: 1:25

DEMO NOTES:

1. EXISTING 400A SPLITTER TO BE REMOVE AND REPLACED BY A NEW 400A, 120/208V, 3Ø4W SPLITTER.
2. EXISTING MAIN SERVICE DISCONNECT TO BE REMOVED C/W WIRING AND CONDUIT.
3. EXISTING HOUSE PANEL TO REMAIN. HOUSE PANEL METER TO BE REMOVED.
4. EXISTING ENCLOSED CIRCUIT BREAKER SERVICE DISCONNECTS TO REMAIN.
5. REMOVE THE DIRECT POWER CONNECTION C/W WIRING AND CONDUIT OF THE EXISTING PUMP.
6. REMOVE THE DIRECT POWER CONNECTION C/W WIRING AND CONDUIT OF THE EXISTING BOILER.



BOILER ROOM #2 POWER LAYOUT – EXISTING & NEW WORK
SCALE: 1:25

DESIGN NOTES:

1. PROVIDE AND INSTALL A NEW 400A, 3Ø4W, 120/208V SPLITTER C/W FEEDER AND BRANCH CIRCUITS. REFER TO THE SLD FOR MORE DETAIL.
2. PROVIDE AND INSTALL A NEW 800A, 3Ø4W, 120/208V, FUSED DISCONNECT SWITCH C/W WIRING AND CONDUIT. REFER TO THE SLD FOR MORE DETAIL.
3. EXISTING HOUSE PANEL TO REMAIN. MODIFY THE FEEDER WRING AND CONNECT DIRECTLY TO THE ENCLOSED CIRCUIT BREAKER.
4. PROVIDE AND INSTALL A NEW METERING CABINET C/W 13-JAW METER BASE AS PER OAKVILLE HYDRO REQUIREMENTS.
5. PROVIDE AND INSTALL A NEW 800A, 120/208V, 3Ø4W PANELBOARD AT THE INDICATED LOCATION. REFER TO THE SLD AND DWG. E-2 FOR MORE DETAILS.
6. PROVIDE NEW WIRING AND CONDUIT FROM THE LINE SIDE OF THE ENCLOSED CIRCUIT BREAKERS TO THE NEW SPLITTER TERMINAL BLOCKS.

ELECTRICAL LEGEND	
ABBREVIATION	
E	EXISTING TO REMAIN
R	EXISTING TO BE DEMOLISHED/REMOVED
N	NEW MATERIAL/EQUIPMENT/SERVICES
REL	MATERIAL/EQUIPMENT/SERVICES TO BE RELOCATED.
ER	EXISTING IN RELOCATED POSITION
WP	WEATHER PROOF
NIC	NOT IN CONTRACT
POWER DISTRIBUTION	
	UNFUSED DISCONNECTING MEANS
	FUSED DISCONNECTING MEANS
	COMBINATION MOTOR STARTER C/W FUSED/UNFUSED DISCONNECTING MEANS (NEMA TYPE C/W H.O.A SELECTOR SWITCH)
	MAGNETIC MOTOR STARTER C/W PILOT LIGHT
	SINGLE PHASE MOTOR LOAD
	THREE PHASE MOTOR LOAD
	DIRECT CONNECTION C/W DISCONNECT SWITCH FOR SINGLE PHASE MOTOR
	DIRECT CONNECTION C/W DISCONNECT SWITCH FOR THREE PHASE MOTOR
EF	EXHAUST FAN
	EQUIPMENT DIRECT CONNECTION
	TRANSFORMER AS SPECIFIED
	FLUSH OR RECESSED PANEL
	ELECTRICAL BASEBOARD HEATER C/W BUILT-IN THERMOSTAT

REVISION NO.

No.	DATE	DESCRIPTION
I.	19/06/2024	ISSUED FOR OAKVILLE HYDRO
II.	28/06/2024	ISSUED FOR ESA PLAN REVIEW
III.	15/07/2024	ISSUED FOR TENDER
IV.	28/06/2024	RE-ISSUED OAKVILLE HYDRO
VI.	23/09/2024	RE-ISSUED FOR TENDER

THE CONTRACTOR MUST VERIFY ALL DIMENSIONS ON AND REPORT ANY DISCREPANCIES TO THE ENGINEER BEFORE PROCEEDING WITH THE WORK.

DO NOT SCALE DRAWINGS.

SEAL

LICENSED PROFESSIONAL ENGINEER
K. NAJAFZADEH
100510929
SEP. 23, 2024
PROVINCE OF ONTARIO

NORTH | TRUE NORTH

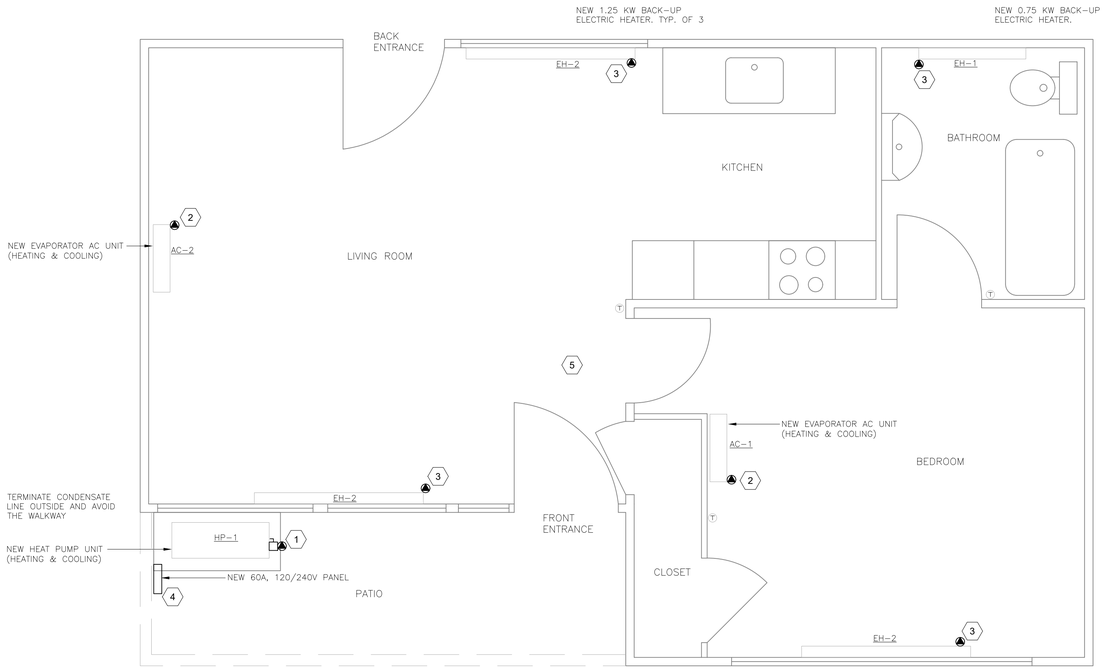
CONSULTANT

SAB ENGINEERING Inc.
588 EDWARD AVE., UNIT 25, RICHMOND HILL, ONT., L4C 9Y6
TEL. (905)-787 8885 FAX (905)-787 8771

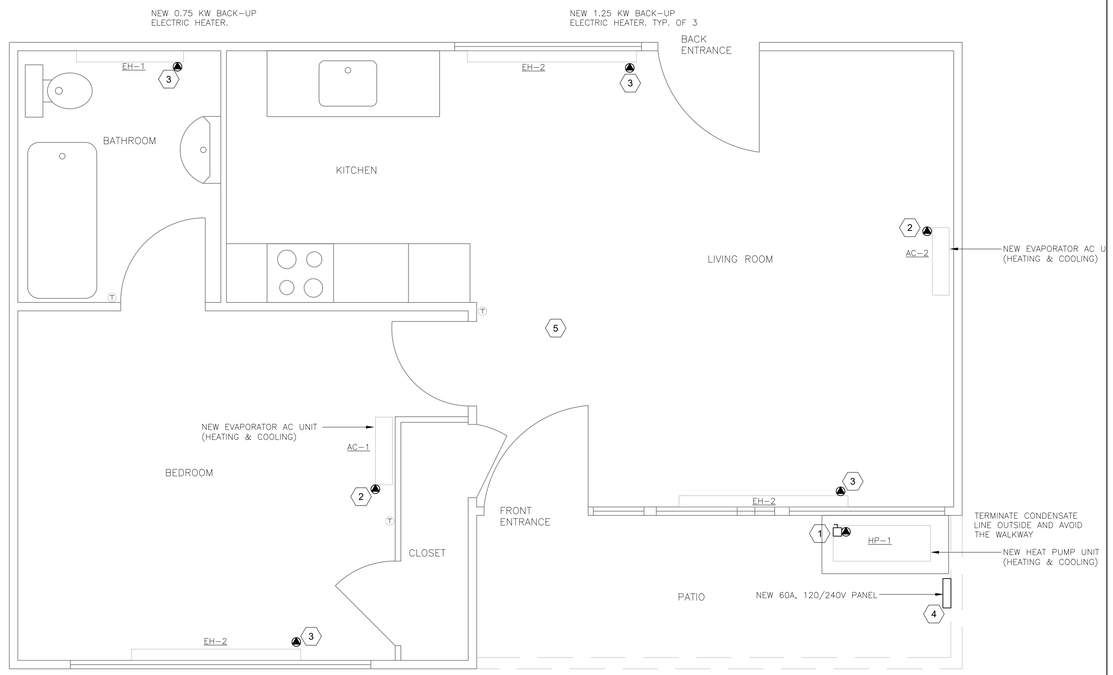
PROJECT
H.V.A.C. & POWER UPGRADES
WOODSIDE DR. & SEDGEWICK CRES
OAKVILLE, ONTARIO L6L 4K9

DRAWING TITLE
BOILER ROOMS
POWER LAYOUT
DEMO & NEW WORKS

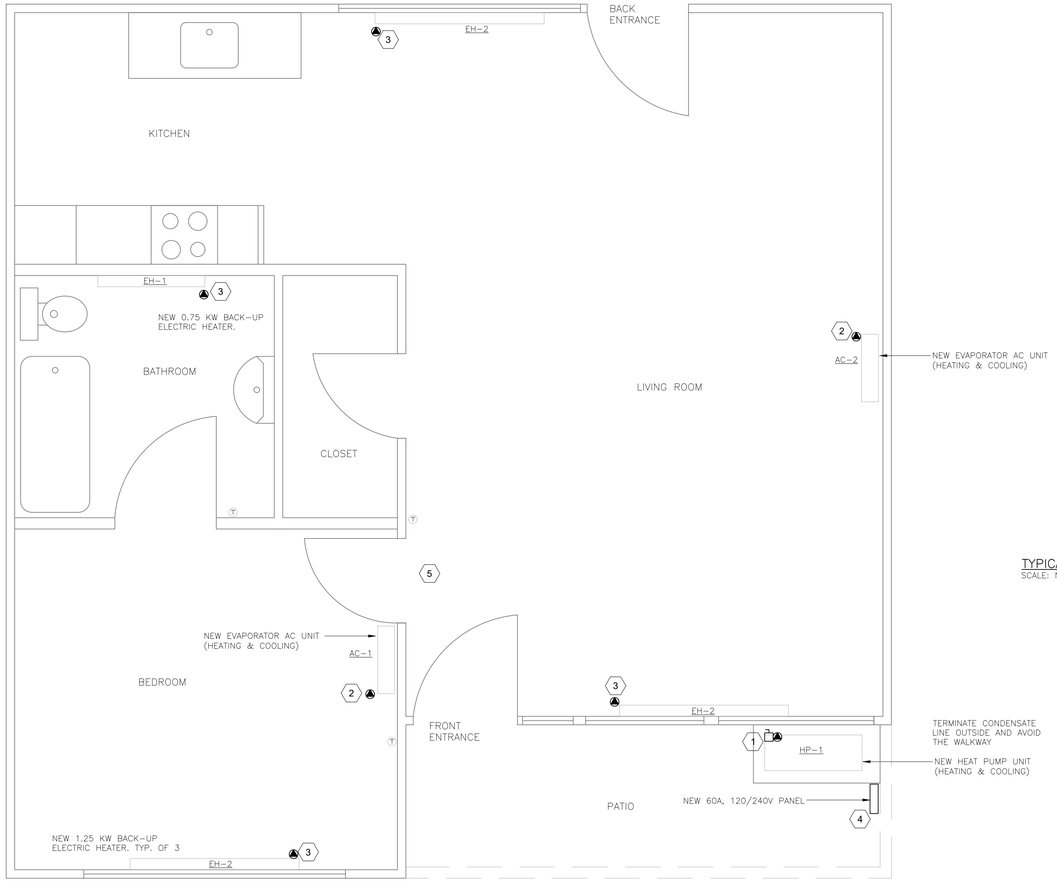
DATE	SCALE
JUN. 24	1:25
DRAWN BY	DWG. No.
K.N.	E-4
JOB No.	
2024-35	



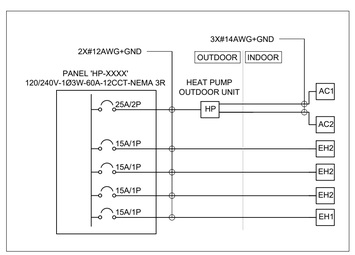
TYPICAL SUITE (PATIO ON THE LEFT OF FRONT ENTRANCE) – NEW WORKS
SCALE: 1:25



TYPICAL SUITE (PATIO ON THE RIGHT OF FRONT ENTRANCE) – NEW WORKS
SCALE: 1:25



TYPICAL SUITE (#252, 254, 256, 258) – NEW WORKS
SCALE: 1:25



TYPICAL WIRING DIAGRAM FOR NEW HEAT PUMP SYSTEM AND BASEBOARD HEATERS
SCALE: NTS

DESIGN NOTES:

1. PROVIDE NEW DIRECT CONNECTION C/W DISCONNECT SWITCH WIRING AND CONDUIT FOR THE NEW HEAT PUMP OUTDOOR UNIT.
2. PROVIDE NEW DIRECT CONNECTION C/W WIRING AND CONDUIT FOR THE NEW INDOOR UNIT.
3. PROVIDE NEW DIRECT CONNECTION C/W WIRING AND CONDUIT FOR THE NEW BASEBOARD HEATER.
4. PROVIDE AND INSTALL NEW PANEL C/W FEEDER, BRANCH CIRCUITS AND CIRCUIT BREAKERS.
5. COORDINATE WITH OTHER TRADES AND INCLUDE COST FOR ALL REQUIRED OPENINGS, PATCHING, AND PAINTING AS NEEDED FOR THE NEW EQUIPMENT INSTALLATION.

REVISION NO.

No.	DATE	DESCRIPTION
I.	19/06/2024	ISSUED FOR OAKVILLE HYDRO
II.	28/06/2024	ISSUED FOR ESA PLAN REVIEW
III.	15/07/2024	ISSUED FOR TENDER
IV.	28/06/2024	RE-ISSUED OAKVILLE HYDRO
VI.	23/09/2024	RE-ISSUED FOR TENDER

THE CONTRACTOR MUST VERIFY ALL DIMENSIONS ON AND REPORT ANY DISCREPANCIES TO THE ENGINEER BEFORE PROCEEDING WITH THE WORK.

DO NOT SCALE DRAWINGS.

SEAL

LICENSED PROFESSIONAL ENGINEER
K. NAJAFZADEH
100510929
SEP. 23, 2024
PROVINCE OF ONTARIO

NORTH | TRUE NORTH

CONSULTANT

SAB ENGINEERING Inc.
588 EDWARD AVE., UNIT 25, RICHMOND HILL, ONT., L4C 9Y6
TEL. (905)-787 8885 FAX (905)-787 8771

PROJECT
H.V.A.C. & POWER UPGRADES
WOODSIDE DR. & SEDGEWICK CRES
OAKVILLE, ONTARIO L6L 4K9

DRAWING TITLE
TYPICAL SUITE PLANS
POWER LAYOUT
NEW WORKS

DATE	SCALE
JUN. 24	1:25
DRAWN BY: K.N.	DWG. No. E-5
JOB No. 2024-35	

SCHEDULE 2 – CONTRACTOR CHECKLIST

The following health and safety program information is to be completed and submitted with the proposal submission. The Region/HCHC reserves the right to review this submission and request documented verification of the stated health and safety program content.

CONTRACTOR NAME (CORPORATION):
CONTRACTOR'S REPRESENTATIVE:
NUMBER OF STAFF (FULL & PART-TIME) EMPLOYED:
TENDER / BID #:

1. WORKPLACE SAFETY AND INSURANCE BOARD

A.	ACCIDENT STATISTICS / REPORTING	YES	NO	Number
i)	Do you maintain files on accident reports?			
ii)	Do you submit reports to the Ministry of Labour for all lost time, medical aid and other legislated accidents/incidents?			
iii)	Do you file a Form 7 with the WSIB for accidents requiring medical attention?			
iv)	Has your company sustained any critical injuries and, if so, how many over the last five years?			
v)	Did you report these critical injuries to the Ministry of Labour?			
vi)	Has your company sustained a fatality; if so, how many?			
vii)	Have you reported any occupational illnesses, such as dermatitis or carpal tunnel syndrome to the WSIB and, if so, how many?			

B.	FIRST AID	YES	NO	Number
i)	How many trained First Aid Responders will be available at the job site?			
ii)	Are up-to-date First Aid Certificates readily available?			
iii)	How many First Aid kits will be available at the job site?			
iv)	Do you maintain First Aid treatment records (not reportable to WSIB)?			
v)	Do you inspect and record the First Aid kits every three months?			

2. HEALTH & SAFETY

A.	HEALTH & SAFETY POLICY AND PROGRAM	YES	NO	N/A
	If you have more than five employees, full and part-time, do you have a Health & Safety policy statement, and a program in place to implement this policy? (This is not a legislated requirement for contractors with five or less employees)			

B.	SAFETY MEETINGS	YES	NO	N/A	Frequency
i)	Do you have a Joint Health and Safety Committee (JHSC) in place? (This is a legislated requirement for contractors with 20 or more full and part-time employees)				
ii)	Do you have a Health & Safety Representative in place, rather than a committee? (A Health & Safety Representative is a legislated requirement for contractors with six to 19 full and part-time employees)				
iii)	Do you hold JHSC meetings?				
	How often?				
	Do you record and maintain minutes?				
iv)	Do you hold safety meetings or tailgates?				
	If so, how often?				
	Do you maintain records of these meetings?				

For Section C, mark each training program conducted by your company that is applicable to the current award and the frequency of the training.

Do you have a corresponding written policy and procedure for each of the topics/hazards noted?
Please record all other courses, not listed, that you conduct with your employees.

C.	TRAINING POLICY / PROGRAMS	YES	NO	N/A	Frequency of Training	Written Procedure	
						YES	NO
	WHMIS – Generic (Legislation Overview)						
	WHMIS – Specific Chemical Review						
	Designated Substances (please list):						
	Accident Investigation						
	Respiratory Protection						
	Workplace Inspections						
	Transportation of Dangerous Goods (TDG)						
	Confined Space Entry						
	Traffic Control						
	Housekeeping						
	Fire Protection						
	First Aid						
	Emergency Procedures						
	Trenching / Shoring / Excavation						

	TRAINING POLICY / PROGRAMS ***continued***	YES	NO	N/A	Frequency of Training	Written Procedure	
						YES	NO
	Lockout / Tag out						
	Forklift						
	Chainsaw						
	Electrical Safety						
	Ladder Safety						
	Crane / Rigging Safety						
	Rescue / Retrieval						
	Lifting Techniques (Manual / Mechanical)						
	Universal Precautions						
	Other (please list):						

For Section D, mark the PPE that you will be providing for the job to be performed.
List all other PPE not noted that you require, or will be providing.

D.	**PERSONAL PROTECTIVE EQUIPMENT REQUIREMENTS**	YES	NO	N/A
	Hard Hats			
	Safety Glasses			
	Safety Goggles			
	Face Shields			
	Hearing Protection			
	Safety Boots			
	Gloves			
	Safety Harnesses (Full Body)			
	Personal Floatation Devices / Life Jackets			
	Traffic Vests			
	Respiratory Protection (specify type):			
	Protective Clothing (gowns, masks, TYVEX suits)			
	Other (please list):			

Section E meets the basic WHMIS requirements.

E.	HAZARDOUS SUBSTANCES	YES	NO	N/A	Copies Requested	Copies Received
i)	Please enclose a list of all chemicals to be used on site.					
ii)	Are all products appropriately labeled?					
iii)	Do you conduct annual training, or review, of the chemicals used by your employees?					
iv)	Please provide a list of all designated substances, such as lead or mercury, to be used on the job.					
v)	If you use designated substances, do you have a control program?					
vi)	Are your chemicals stored in adequate storage containers for use on the job site?					
vii)	Do you have a written policy and procedure for hazardous chemicals?					
viii)	Please enclose a copy of all safety data sheets (SDSs) for products to be used on the job.					

F.	ORIENTATION	YES	NO	N/A
i)	Do you provide an orientation program for all new employees?			
ii)	Please mark each topic reviewed in orientation, if applicable, and list all other topics covered:			
	Foot Protection			
	Head Protection			
	Eye Protection			
	Hearing Protection			
	Respiratory Protection			
	Safety Harness and Lifeline			
	Scaffolding			
	Housekeeping			
	Ladders			
	Fire Protection			
	First Aid Facilities			
	Emergency Procedures (e.g. Fire, Spills)			
	Toxic / Hazardous Substances			
	Trenching / Excavation			
	Signs, Barricades, Flagging			
	Electrical Safety			
	Confined Space Entry			

ORIENTATION - *continued*		YES	NO	N/A
	Crane Safety			
	Accident Reporting			
	Occupational Health & Safety Act			
	Other (please list):			

G.	**EQUIPMENT**	YES	NO	N/A	Frequency	Copies	
						Requested	Received
i)	Enclose a list of all equipment to be used on the job site, excluding non-powered hand tools.						
ii)	Do you conduct pre-start inspections of large motorized equipment						
	Do you maintain records of these inspections?						
iii)	Do you conduct monthly inspections of all motorized equipment?						
	Do you maintain records of these inspections?						
iv)	Do you conduct routine maintenance on all equipment						
	How often is the maintenance conducted?						
	Do you maintain records of this maintenance?						
v)	Are operational manuals available on the job site or on the equipment for all large motorized equipment?						

H.	**EQUIPMENT APPROVED SAFE**	YES	NO	N/A
i)	Do you have all large motorized equipment, such as cranes or forklifts, certified on an annual basis?			
ii)	Which company performs this certification?			

I.	WORK PERMITS	YES	NO	N/A
	Do you use written work permits for the following jobs, if applicable? List all other work permits not noted.			
	Hot Work			
	Confined Space Entry			
	Lockout / Tagout			
	Other (please list):			

The undersigned hereby acknowledges and represents that the information set out in this form is accurate as of the date of signing.

Dated at _____ this _____ day of _____ 20 .

_____
Signature of Signing Officer

_____
Name

_____
Title

MAPLE ENVIRONMENTAL INC.
ENVIRONMENT, HEALTH & SAFETY CONSULTANTS

January, 2016

MAPLE PROJECT NO. 16023

DESIGNATED SUBSTANCE AND DETAILED ASBESTOS BUILDING MATERIALS SURVEY REPORT

Rotary Gardens Housing Complex

1285 Sedgewick Crescent

Oakville, ON

L6L 1X7

Presented to:

Ms. Kathy Harris
Regional Municipality of Halton
Facilities Design & Development
Asset Management
Regional Municipality of Halton
1151 Bronte Road – Level 1
Oakville, ON
L6M 3L1

482 South Service Rd. E. • Suite 116 • Oakville • Ontario • L6J 2X6 • Tel: 905-257-4408 • Fax: 905-257-8865
www.MapleEnvironmental.com

EXECUTIVE SUMMARY

MAPLE Environmental Inc. ("MAPLE") was retained by the Region of Halton to perform a survey for Designated Substances as well as mould and PCBs within the Rotary Gardens Housing Complex located at 234 to 274 Woodside Drive and 1285 to 1299 Sedgwick Drive, Oakville, Ontario (the "Site"), to fulfill requirements under Section 30 of the Occupational Health and Safety Act (Designated Substances).

The survey was limited to the Laundry Rooms, Boiler Rooms, and Units 238, 1293, 244, and 262. The findings of the current assessment are summarized below. Please refer to the main body of the report for details.

FINDINGS

Asbestos

Confirmed asbestos-containing materials (ACM) identified within the buildings at the time of the assessment are as follows:

- Vinyl Floor Tiles
- Mastic associated with Vinyl Floor Tiles
- Mechanical Insulations (Parging Cement Insulation)
- Drywall Joint Compound

Suspect asbestos-containing materials identified within the buildings at the time of the assessment are as follows:

- Transite Cement (Pipes) located within and outside the building
- Fire Door Insulation

Please refer to the main report to view location, quantities, and condition of ACM observed within the buildings at the time of the assessment.

Lead

- No paint finishes within the building were found to be lead-containing.
- It should be noted that lead may also be present in wiring connectors, electric cable sheathing, mortar, ceramic tile glazing and solder joints on copper piping, where present.

Mercury

- Mercury vapour is present in all fluorescent light tubes.

Silica

- Free crystalline silica is commonly found in insulation material and construction sand, and may be present in gypsum rock, mortar, concrete and masonry products, ceiling tiles and insulation where present in the building.

Mould

- Staining and minor mould growth was observed on drywall ceilings, within crawl spaces, and attic spaces within various areas of the complex.
- It is possible that mould growth is present in concealed areas such as wall or ceiling cavities, pipe chases, etc. or in areas not currently assessed by Maple. The client should notify Maple should any water damage or suspect mould growth be discovered.
- Please refer to the main report to view location, quantities, and condition of mould observed within the buildings at the time of the assessment.

Polychlorinated Biphenyls

- The fluorescent lamp fixtures observed contained a combination of T8 and T12 fluorescent light tubes. T12 fixtures are older fixtures and have the potential of having PCB-containing ballast. T8 fixtures have electronic ballast and are considered as not containing PCB.

RECOMMENDATIONS

Asbestos

Asbestos-containing materials were found to be present within the building at the time of the assessment. Therefore an Asbestos Management Program (AMP) is required for this Housing Complex.

It should be noted that the assessment was limited in scope to four (4) Residential Units and Common Areas. Additional remedial work may be required in other units not identified herein.

For compliance with Regulation 278/05 the following remedial action is required:

Using Type 1 Asbestos procedures repair all ACM in FAIR condition at the locations listed in the table below:

Unit & Room Name	Building Material	Building System	Description	Quantity
Unit 244 Bedroom	Drywall	Wall	Above Doorway	1 SF
Unit 262 Bedroom	Drywall	Wall	Above Doorway	1 SF
North-West Boiler Room	Drywall	Ceiling	Holes in Drywall	5 SF

Using Type 1 Asbestos procedures, remove all ACM in POOR condition at the locations listed in the table below:

Unit & Room Name	Building Material	Building System	Description	Quantity
Unit 1293 Bedroom	VFT-01	Floor	Damage Within the Closet	10 SF
Unit 238 Bedroom	VFT-02	Floor	Tile Debris Within the Closet	1 SF
Unit 262 Crawl Space	VFT-04	Floor	Damage to Backside of Hatch	7 SF
North-West Boiler Room	VFT-05	Floor	Damage to Edging	2 SF
South-East Boiler Room	Drywall	Ceiling	In Corner of Room	10 SF

Using Type 2 Asbestos procedures, repair all ACM in FAIR condition at the locations listed in the table below:

Unit & Room Name	Building Material	Building System	Quantity
Unit 262 Crawl Space	Parging Cement	Pipe Fittings	15 Each
North-West Laundry Room Crawl Space	Parging Cement	Pipe Fitting	1 Each

Using Type 2 Asbestos procedures, clean-up all ACM in FAIR condition at the location listed in the table below:

Unit & Room Name	Building Material	Building System	Description	Quantity
South-East Boiler Room	Drywall	Ceiling	Drywall Debris on Floor	10 SF

Using Type 2 Asbestos procedures remove all ACM in POOR condition at the locations listed in the table below:

Unit & Room Name	Building Material	Building System	Quantity
North-West Laundry Room Crawl Space	Parging Cement	Pipe Fitting	1 Each

All remaining asbestos-containing materials identified within the assessed portions of the facility were observed to be in GOOD condition and therefore no additional immediate recommendations are warranted.

Lead

Low Level Lead paints (0.1% or less) are considered virtually safe provided that;

- airborne lead concentrations are kept below 0.05 mg/m^3
- general dust suppression and worker hygiene procedures are utilized
- torching or other activities that create fumes are not completed

Mercury

No immediate recommendations are warranted. Follow appropriate procedures if disturbed or removed.

Silica

No immediate recommendations are warranted. Follow appropriate procedures if disturbed or removed.

Mould

Using Level 2 mould remediation procedures (at a minimum), remove and replace the fibreglass batt insulation within the attic spaces of Units 1293, 238 and 244. Additionally, use abrasive cleaning on the stained wood sheathing.

Using Level 2 mould remediation procedures, remove the mould present on the fibreglass panel within the Crawl Space of Unit 1293, and the mould present within the Attic of the South-East Laundry Room.

Additionally, monitor the staining on the ceilings within the North-West and South-West Boiler Rooms and the staining below the window within the Living Room in Unit 238.

PCBs

When removing light fixture ballasts, all ballasts not clearly marked as "non-PCB" on the label should be separated, handled and disposed of as PCB-containing or inspected by competent persons to ascertain PCB content.

General Statement

The Executive Summary must be read in conjunction with the main body of this report.

TABLE OF CONTENTS

1.0 INTRODUCTION

MAPLE Environmental Inc. ("MAPLE") was retained by the Region of Halton to perform a survey for Designated Substances as well as mould and PCBs within the Rotary Gardens housing complex located at 234 to 274 Woodside Drive and 1285 to 1299 Sedgwick Drive, Oakville, Ontario (the "Site").

The subject site is a 28 unit townhouse that was constructed prior to 1990. The scope of the assessment was limited to 4 of the 28 units (Units 238, 1293, 244 and 262) as well as the common areas (including the Laundry and Boiler Rooms). Findings are considered representative of building finishes present in Units not assessed at the time of the current survey.

Section 30 of the Ontario Occupational Health and Safety Act requires that the following Designated Substances be included in a Designated Substance survey:

Asbestos
Lead
Mercury
Silica
Isocyanates
Vinyl Chloride Monomer
Benzene
Acrylonitrile
Coke Oven Emissions
Arsenic
Ethylene Oxide

Although not deemed Designated Substances, mould and polychlorinated biphenyls (PCBs) were included in the assessment as they are subject to similar guidelines.

The findings of the inventory are contained in the following report. Elaine Skinner and Samantha Russo of MAPLE conducted the fieldwork on December 15th, 2016.

2.0 APPLICABLE ONTARIO REGULATIONS

Applicable Ontario Regulations for each of the materials included in the assessment are briefly described below.

2.1 Designated Substances and Other Hazardous Materials

Section 30 of the Occupational Health and Safety Act requires building owners or their agents (architects, general contractors, etc.) to prepare or have prepared a Designated Substance report for specified potentially hazardous materials possibly present in a facility. The owner must ensure that a prospective constructor has received a Designated Substance report before entering into a binding contract with the contractor. The owner is liable to the contractor for damages and costs arising from unreported materials (of which the owner should reasonably have been aware), and could also be subject to orders and fines from the Ministry of Labour.

In addition to the requirements under the Occupational Health and Safety Act, Section 6 of the Ministry of Labour Regulations for Construction Projects requires the contractor, when submitting the Notice of Project form, report any Designated Substances likely to be used, handled or disturbed during the project.

There are no specific Ministry of Labour regulations for control of the other Designated Substances on construction projects. However, the Ministry of Labour actively enforces the general duty clause of the Health and Safety Act which protects workers and provides guidance on exposure monitoring, permissible exposure levels, medical monitoring, etc. for all Designated Substances.

Although Regulations exist for many of the Designated Substances, they apply to industry settings using Designated Substances in manufacturing processes, and do not apply to general property management, renovation or maintenance of buildings.

2.2 Ontario Regulation 278/05 (Asbestos)

Ontario Regulation 278/05 applies to buildings with regards to maintenance, renovations or demolition work where asbestos-containing materials (ACM) is present and may be disturbed. The Regulation requires that a detailed asbestos inventory be performed in all buildings where friable and non-friable asbestos materials are present. The inventory must be available at the work place and must identify the type of asbestos, and location of asbestos on a room-by-room basis. The following report does not necessarily meet the requirements for an asbestos survey under Ontario Regulation 278/05.

In addition, the regulation requires all buildings where asbestos has been used as part of the building to implement an Asbestos Management Program (AMP).

The major requirements of the AMP include:

- Preparation and maintenance of an on-site record of where asbestos material is located;
- Written notification provided to tenants or lessees occupying space where asbestos is present;
- Advise workers of the owner, other staff and outside contractors of the presence and location of ACM;
- Institute and maintain a program for the training and instruction of every worker employed in the building that is likely to work in close proximity to and may disturb asbestos.
- Update the asbestos report (minimum annually)
- Preparation of written asbestos work practices;
- Repair or removal of all damaged asbestos where it may be disturbed; and
- Other record keeping.

2.3 Ontario Regulation 347

Ontario Regulation 347 applies to the transport of waste from the location of generation to a landfill site authorized to receive specific wastes. The regulation also prescribes procedures on how the specific wastes are to be handled at the landfill site.

The major requirements of the building owner and the person(s) removing the waste are to ensure that:

- The waste is appropriately packaged and labelled;
- The transport vehicle is appropriately placard; and
- The waste is to be transported as directly as possible to the landfill site once it leaves the site.

Some wastes require the owner to register a Generator (of waste) number and many wastes require classification that can restrict or even prohibit their disposal in landfill.

It is important to note that the building owner can be held responsible for the waste until the waste disposal site accepts it.

2.4 Ontario Regulation 362

Ontario Regulation 362, made under the Ontario Environmental Protection Act applies to the waste management and transport of PCB waste from the location of generation to a landfill site authorized to receive specific wastes. The regulation also prescribes procedures on how the specific wastes are to be handled at the landfill site.

3.0 SURVEY SCOPE AND METHODOLOGY

In order to determine the location of materials included in the assessment, the project technologist entered each room, service area, etc. where practical (i.e. where access was possible without the demolition of walls, roof or ceilings or destruction of flooring). Representative views were made above accessible suspended ceiling systems. Cavities within solid ceiling and wall systems were accessed via existing access panels only. The inventory did not include demolition of building systems or finishes to check on possible hidden conditions.

For housing complexes, it is not generally practicable to enter every unit as part of the survey. As such, as directed by the client, four (4) units were included in the survey. It is assumed that the balance of the Units have similar finishes and materials.

3.1 Asbestos-Containing Building Materials (ACM)

The scope of the survey included all friable asbestos products and all major non-friable asbestos materials. The term friable is applied to a material that can be readily reduced to dust or powder by hand or moderate pressure. Asbestos materials that are friable have a much greater potential to release airborne asbestos fibres when disturbed.

Typical friable asbestos materials include: sprayed fireproofing or thermal insulation, textured (stippled) plaster, and thermal mechanical insulation. Typical non-friable materials include: asbestos cement (transite) products, vinyl floor tiles, asbestos textiles and gaskets. Additional materials such as ceiling tiles, drywall joint compounds, plaster and vinyl sheet flooring are classified as non-friable, but because of their ability to release dust when disturbed are considered as "potentially friable" for the purpose of this report.

Bulk samples of materials suspected to contain asbestos were collected for analysis during the survey. Specifically, a small volume of material was removed either from a damaged section of suspect material, or taken from intact material. In these latter cases, the material from which the sample was collected was sealed with tape to temporarily prevent fibre release. Samples were placed in plastic bags and sealed until receipt by an independent laboratory. To ensure quality results, the independent laboratory chosen successfully participates in an "Asbestos Proficiency Analytical Testing Program". As such, these independent laboratories are responsible for their findings.

Bulk samples were collected in accordance with regulatory sampling requirements and with sufficient frequency to obtain a general pattern of asbestos use within the building. Due to building renovations or modifications that may have occurred in the past, the consistency of the application of asbestos materials may not be uniform throughout the entire Site. It is important to note that without sampling each individual wall, pipe section, ceiling tile, etc. it is not possible to identify the asbestos content of every material present in the building. For this reason, visually similar materials are considered to be homogenous with those already sampled elsewhere in the building without additional analysis.

O. Reg. 278/05 prescribes that a minimum number of samples be collected of materials suspected to contain asbestos. These minimum sampling requirements are summarized in Table 1, below.

Table 1 - Suspect ACM Bulk Sampling Requirements

Type of Material	Quantity of Material Present	Minimum # of Bulk Samples Required
Surfacing Materials (i.e. sprayed fireproofing, drywall joint compound, texture coat, and plaster)	Up to 90 sq. m. (1000 sq. ft.)	3
	From 90 sq. m. (1000 sq. ft.) to 450 sq. m. (5000 sq. ft.)	5
	Greater than 450 sq. m. (5000 sq. ft.)	7
All other potential ACM	Any	3

Excluding surfacing materials, the laboratory was instructed to cease analysis within Sample Groups of homogenous materials when one of the samples in the group is found to contain asbestos. For example, if three samples of a type of vinyl floor tile are collected (as required by O. Reg. 278/05) and submitted for analysis and the first sample is positively identified as containing asbestos, the balance of the sample group is not analysed.

In order to properly locate and record all asbestos suspect materials in the buildings, a thorough investigation of each accessible room was performed in each of the 4 units where access was provided, as well as common areas within the complex (Laundry and Boiler Rooms). Inspections were made above ceilings and with-in mechanical chases where access is possible without demolition of wall and ceiling finishes.

EMC Scientific Inc. ("EMC"), an independent laboratory, was selected to analyse the collected bulk suspect asbestos samples. EMC successfully participates in an "Asbestos Proficiency Analytical Testing Program" and as such, is responsible for its findings. EMC followed the Code of Practice for the identification of asbestos in bulk material, as detailed in O. Reg. 278/05. Bulk samples were analysed using the Polarized Light Microscopy ("PLM") Technique with Dispersion Staining. The identification of asbestos fibre in bulk material is based on a collective set of parameters dependent on the unique shape and crystallographic properties of each fibre as viewed through the microscope. This method is useful for the qualitative identification of asbestos and the semi-quantitative determination of asbestos content in bulk materials expressed as a percent of projected area. The method identifies types of asbestos and also measures percent of asbestos as perceived by the analyst in comparison to standard area projections or trained experience.

The recommendations made as part of this report with respect to asbestos have taken into consideration: the condition and accessibility of the material, vibration, air movement, and general activities likely to occur within the vicinity of the ACM.

Where ACM is found to be in GOOD condition and not likely to deteriorate or fall, the general recommendation would be to re-evaluate the condition of the material on an annual basis (required by O. Reg. 278/05). This recommendation can be subject to change if the material is located in a manner that persons untrained in asbestos awareness could physically damage it.

Where ACM is found to be damaged (i.e. FAIR or POOR condition), a recommendation to have the material cleaned-up, repaired, removed, enclosed, or encapsulated is offered. The recommendation will also indicate which asbestos procedure should be used to perform the remedial work (i.e. Type 1, Type 2, Type 3, or Glove Bag Removal Methods).

In each area or room inventoried, the technician recorded the quantity, and condition (GOOD, FAIR, or POOR) of each suspect material.

The definitions for condition and accessibility items are as follows:

GOOD Material is intact with no visible signs of damage.

FAIR Material is visibly damaged but can be repaired.

POOR Material is damaged beyond repair and likely needs to be removed.

3.2 Lead

The assessment included the collection and analysis of all major paint colour applications for the presence of lead in the paint. Other materials that possibly contain lead were identified by known historic use, where relevant. EMSL Analytical Inc. ("EMSL"), an independent laboratory, was selected to analyse the collected bulk suspect lead samples, using atomic absorption spectrophotometry. EMSL is AIHA (American Industrial Hygiene Association) and NIOSH (National Institute of Occupational Safety and Health) accredited for this type of analysis. The Laboratory Analysis Report for lead in paint samples is included with this report as Appendix II.

3.3 Mercury

The assessment included a visual identification of fluorescent light tubes, switches, electrical controls, heating system thermostats, thermometers, and other components historically known to contain mercury.

3.4 Mould

The assessment for mould was conducted in accordance with standard industry practice as set out in the Environmental Abatement Council of Ontario (EACO) Mould Abatement Guideline and in the Canadian Construction Association (CCA) "Mould Guidelines for the Canadian Construction Industry" for a visual assessment. Although there are no regulatory requirements in Ontario for such an assessment, the EACO and CCA Guidelines, and similar guidelines from other agencies have been accepted as the industry standard by most experts, consultants, the Ontario Ministry of Labour, and the Canadian Construction Association.

All guidelines and protocols for mould assessments indicate that assessments should be performed largely on a visual basis with limited collection of bulk and/or air samples. The Ontario Ministry of Labour has consistently enforced the removal of all mould from buildings regardless of mould genus or species, and therefore bulk samples or air samples for confirmation of mould are not typically collected for investigative purposes where mould is visible.

3.5 Polychlorinated Biphenyls

Manufacturers labels/codes collected from fluorescent lamp ballasts suspected of containing Polychlorinated Biphenyls (PCBs) are compared with Environment Canada's document titled "Identification of Lamp Ballasts Containing PCBs", which identifies PCB-containing ballasts.

3.6 Other Materials

Other materials listed in Section 1.0 of this report were identified on a visual basis where present, as part of the current assessment. It should be noted that no manufacturing or heavy industrial activities are known by Maple to occur at the Site. Therefore, Designated Substances associated with these activities (i.e. those other than Asbestos, Lead, Mercury, and Silica) would not be expected to be present at the subject facility.

3.7 Limitations and Omissions from Scope

Due to the nature of building construction some limitations exist as to the possible thoroughness of any building materials inventory. The field observations, measurements, and analysis are considered sufficient in detail and scope to form a reasonable basis for the findings presented in this report. Maple warrants that the findings and conclusions contained herein have been made in accordance with generally accepted evaluation methods in the industry and applicable regulations at the time of the performance of the inventory.

It is possible that conditions may exist which could not be reasonably identified within the scope of the inventory or which were not apparent during the Site assessment. Maple believes that the information collected during the assessment concerning the property is reliable. No other warranties are implied or expressed.

During a standard ACM inventory performed for the purposes of regulatory compliance, it is industry practice to exclude certain suspect asbestos-containing materials from sampling. These materials are often excluded from sampling due to the risk of compromising the health and safety of the technician, other building occupants, or the integrity of the systems with which these materials are associated. Examples of such materials include; elevator brakes, roofing felts and mastics, high voltage wiring, mechanical packing and gaskets, underground services or piping, fire-doors, window caulking and levelling compound. Where observed, these materials were presumed to be ACM.

4.0 INVENTORY FINDINGS

At the time of the assessment, there was access to all areas of the units assessed, with the exception of the attic space within Unit 262. In addition, there was limited access to the crawl spaces within each of the units.

4.1 Asbestos

The following is a brief discussion of the extent to which ACM was identified in the building. The discussion is organized under the headings of materials that are generally suspected of containing asbestos. The sample numbers refer to the laboratory analysis report presented as Appendix I and summarised in Table 2 below. Thirty-one (31) bulk samples were collected for the determination of asbestos content and submitted to the lab to be analysed. Due to the presence of more than one phase of material in some of the original samples the laboratory may have performed multiple analyses for some samples. In addition, some of the samples may not have been analysed due to the positive confirmation of asbestos in a previous sample of the same material during analysis. As a result, a total of thirty-seven (37) samples were analyzed.

Table 2
Summary of Analysis of Bulk Samples
1285 Sedgewick Crescent, Oakville, ON

Sample No.	Sample Location	Sample Description	Result
A01-A	Unit 1293 Living Room Closet	12” x 12” Off-White with Beige Flecks Vinyl Floor Tile	ND
		Black Mastic	ND
A01-B	Unit 1293 Bedroom Closet	12” x 12” Off-White with Beige Flecks Vinyl Floor Tile	ND
		Black Mastic	ND
A01-C	Unit 1293 Bedroom Closet	12” x 12” Off-White with Beige Flecks Vinyl Floor Tile	ND
		Black Mastic	ND
A02-A	**Unit 283 Bedroom Closet**	**9” x 9” White with Green & Blue Spots Vinyl Floor Tile**	**2% CH**
		Brown Mastic	ND
A02-B	Unit 283 Bedroom Closet	9” x 9” White with Green & Blue Spots Vinyl Floor Tile	NA
		Brown Mastic	ND
A02-C	Unit 283 Bedroom Closet	9” x 9” White with Green & Blue Spots Vinyl Floor Tile	NA
		Brown Mastic	ND

Table 2
Summary of Analysis of Bulk Samples
1285 Sedgewick Crescent, Oakville, ON

Sample No.	Sample Location	Sample Description	Result
A03-A	Unit 262 Bedroom Closet	12" x 12" Off-White with Grey Flecks Vinyl Floor Tile	ND
		Black Mastic	ND
A03-B	**Unit 262 Bedroom Closet**	12" x 12" Off-White with Grey Flecks Vinyl Floor Tile	ND
		Black Mastic	**1% CH**
A03-C	South-East Laundry Room	12" x 12" Off-White with Grey Flecks Vinyl Floor Tile	ND
		Black Mastic	NA
A04-A	**Unit 262 Bedroom Closet**	**12" x 12" Beige with Brown Streaks Vinyl Floor Tile**	**3% CH**
		Black Mastic	**1% CH**
A04-B	Unit 262 Bedroom Closet	12" x 12" Beige with Brown Streaks Vinyl Floor Tile	NA
		Black Mastic	NA
A04-C	Unit 262 Bedroom Closet	12" x 12" Beige with Brown Streaks Vinyl Floor Tile	NA
		Black Mastic	NA
A05-A	**North-West Boiler Room**	**9" x 9" Brown with Dark Brown Streaks Vinyl Floor Tile**	**2% CH**
		Black Mastic	**3% CH**
A05-B	North-West Boiler Room	9" x 9" Brown with Dark Brown Streaks Vinyl Floor Tile	NA
		Black Mastic	NA
A05-C	North-West Boiler Room	9" x 9" Brown with Dark Brown Streaks Vinyl Floor Tile	NA
		Black Mastic	NA
A06-A	Unit 1293 Crawl Space (Applied to Walls)	Black Tar Paper	ND
A06-B	Unit 238 Crawl Space (Applied to Walls)	Black Tar Paper	ND
A06-C	Unit 238 Crawl Space (Applied to Walls)	Black Tar Paper	ND
A07-A	**Unit 262 Crawl Space**	**Parging Cement**	**50% CH**
A07-B	Unit 262 Crawl Space	Parging Cement	NA
A07-C	Unit 262 Crawl Space	Parging Cement	NA
A08-A	Unit 262 Crawl Space	Cellulose: Brown Layer	ND
		Cellulose: Black Layer	ND
A08-B	Unit 262 Crawl Space	Cellulose: Brown Layer	ND
		Cellulose: Black Layer	ND
A08-C	North-West Laundry Room Crawl Space	Cellulose: Brown Layer	ND
		Cellulose: Black Layer	ND
A09-A	**Unit 144 Bedroom**	**Beige Drywall Joint Compound**	**2% CH**
		White Drywall Joint Compound	ND
A09-B	Unit 262 Bedroom	Drywall Joint Compound	ND

Table 2 Summary of Analysis of Bulk Samples 1285 Sedgewick Crescent, Oakville, ON			
Sample No.	**Sample Location**	**Sample Description**	**Result**
A09-C	**Unit 244 Kitchen**	**Drywall Joint Compound**	**3% CH**
A09-D	**Unit 238 Bedroom**	**Drywall Joint Compound**	**3% CH**
A09-E	**North-West Laundry Room**	**Drywall Joint Compound**	**2% CH**
A09-F	**South-East Boiler Room**	**Drywall Joint Compound**	**3% CH**
A09-G	**North-West Boiler Room**	**Drywall Joint Compound**	**2% CH**

ND – None Detected, CH – Chrysotile Asbestos, NA – Sample Not Analyzed

Asbestos-containing materials (ACM) and suspect ACM are present in the form of vinyl floor tiles, mastic (associated with vinyl floor tiles), parging cement, drywall joint compound, transite cement pipes, and fire door insulation. Details for all confirmed and suspect asbestos-containing materials are presented below under the headings of the most typical asbestos applications in buildings.

Destructive testing was not conducted and as such some areas within the building were not accessible for an assessment (i.e. above solid ceilings, behind walls). Access for viewing within wall and ceiling cavities was not always possible. Suspect asbestos materials may be present within ceiling and wall cavities that were not identified in this report. This comment is particularly important for materials such as mechanical insulation and vermiculite. Caution should be taken when demolishing solid wall finishes within the building.

Additionally, not all units on site were assessed. If building materials are discovered that are not identified in the report they should be assumed to be asbestos-containing until sampling proves otherwise.

4.1.1 Sprayed Fireproofing (Friable)

No sprayed fireproofing was observed within the complex at the time of the assessment.

4.1.2 Thermal Mechanical Insulation (Friable)

Asbestos and non-asbestos mechanical insulations are present in the complex. The various types of mechanical insulations and the system to which they are applied are summarised below.

Pipe Fittings:

Parging cement insulation on pipe fittings (which include elbows, valves, tees, hangers, etc.) was observed within the Crawl Space of Unit 262.

Three (3) representative samples (Sample Set A07:A-C) of parging cement were collected and analysed for determination of asbestos content. Analysis of Sample Set A07 found that the samples contained **50% Chrysotile asbestos.**

Fifteen (15) asbestos-containing parging cement fittings were observed within the crawl space of Unit 262, and were found to be in FAIR condition at the time of the assessment.

Additionally, two (2) asbestos-containing parging cement fittings were observed within the crawl space of the North-West Laundry Room. One (1) fitting was found to be in FAIR condition, and one (1) was found to be in POOR condition at the time of the assessment.

Due to limited access within the crawl spaces, it is assumed that all crawl spaces within the building complex have additional parging cement fittings that are not noted in this report.

All other pipe fittings observed within the building were either insulated with non-asbestos fibreglass, PVC, armaflex, or were not insulated.

Pipe Straights:

Layered paper insulation known as "Cellulose" was observed within the Crawl Spaces of Unit 262 and North-West Laundry Room. Cellulose is historically found on cold water piping, drains, and in some instances on condensate return piping.

Three (3) representative samples (Sample Set A08:A-C) of Cellulose pipe insulation were collected and analysed for determination of asbestos content. Analysis of Sample Set A08 found that the samples do not contain asbestos.

All remaining pipe straights observed were either insulated with non-asbestos fibreglass, PVC, armaflex, or were not insulated.

Duct Systems

Duct systems observed throughout the complex were observed to be not insulated.

Mechanical Equipment

Radiators, boilers, boiler breeching, hot water tanks and expansion control tanks were observed to be externally not insulated.

4.1.3 Texture Finish (Friable)

No textured finishes were observed within the complex at the time of the assessment.

4.1.4 Acoustic Ceiling Tiles (Potentially Friable)

No acoustic ceiling tile systems were observed within the complex at the time of the assessment.

4.1.5 Vinyl Sheet Flooring (Potentially Friable)

No asbestos-containing vinyl sheet flooring finishes were identified within the complex at the time of the assessment.

Two (2) visually distinct types of vinyl sheet flooring finishes were observed within select units of the complex. No samples of the vinyl sheet flooring were collected as unit residents notified Maple that the material was recently installed and is therefore not suspected to contain asbestos.

4.1.6 Vinyl Floor Tile (Non-Friable)

Asbestos-containing vinyl floor tile systems were identified within the complex at the time of the assessment.

Five (5) visually distinct types of vinyl floor tiles systems were observed in the building. A brief description of each type of vinyl floor tile is outlined below.

- **VFT-01 (12" x 12" Off-White with Beige Flecks)**

  Three (3) representative samples (Sample Set A01:A-C) of VFT-01 were collected and analyzed for determination of asbestos content. Analysis of Sample Set A01 found that the samples do not contain asbestos. Black mastic was also analyzed as part of the sample set and was found not to contain asbestos. Although the samples indicate that the material does not contain asbestos, black mastic associated with other vinyl floor tile was found to contain asbestos in other areas of the complex. Ontario Regulation 278/05 requires homogenous material to be considered as an asbestos-containing material if one or more samples are found to contain asbestos. As such, all black mastic is to be considered as asbestos-containing until sampling proves otherwise. As the tile cannot be removed without the disturbance of the associated mastic, VFT-01 is also deemed to be asbestos-containing.

  Asbestos-containing VFT-01 was observed within Unit 1293 and the North-West Laundry Room, and was found to range from GOOD to POOR condition at the time of the assessment. Approximately 10 SF was observed in POOR condition within the Bedroom of Unit 1293.

- **VFT-02 (9" x 9" White with Green & Blue Spots)**

  Three (3) representative samples (Sample Set A02:A-C) of VFT-02 were collected and analyzed for determination of asbestos content. Analysis of Sample Set A02 found that the samples contain **2% Chrysotile asbestos**. Black mastic was also analyzed as part of the sample set and was found not to contain asbestos. Although the samples indicate that the material does not contain asbestos, black mastic associated with other vinyl floor tile was found to contain asbestos in other areas of the complex. Ontario Regulation 278/05 requires homogenous material to be considered as an asbestos-containing material if one or more samples are found to contain asbestos. As such, all black mastic is to be considered as asbestos-containing until sampling proves otherwise.

  Asbestos-containing VFT-02 was observed within Unit 238, and was found to be in GOOD condition at the time of the assessment, with the exception of 1 SF of tile debris in the Bedroom.

- **VFT-03 (12" x 12" Off-White with Grey Flecks)**

  Three (3) representative samples (Sample Set A03:A-C) of VFT-03 were collected and analyzed for determination of asbestos content. Analysis of

Sample Set A03 found that the samples do not contain asbestos. However, black mastic was also analyzed as part of the sample set and was found to contain **1% Chrysotile asbestos**. As the tile cannot be removed without the disturbance of the associated mastic, VFT-03 is also deemed to be asbestos-containing.

Asbestos-containing VFT-03 was observed within Unit 262 and the South-East Laundry Room, and was found to be in GOOD condition at the time of the assessment.

- **VFT-04 (12" x 12" Beige with Brown Streaks)**

  Three (3) representative samples (Sample Set A04:A-C) of VFT-04 were collected and analyzed for determination of asbestos content. Analysis of Sample Set A04 found that the samples contain **3% Chrysotile asbestos**. Black mastic was also analyzed as part of the sample set and was found to contain **1% Chrysotile asbestos**.

  Asbestos-containing VFT-04 was observed on the backside of the floor hatch within the bedroom of Unit 262, and was found to be in POOR condition at the time of the assessment.

- **VFT-05 (9" x 9" Beige with Dark Brown Streaks)**

  Three (3) representative samples (Sample Set A05:A-C) of VFT-05 were collected and analyzed for determination of asbestos content. Analysis of Sample Set A05 found that the samples contain **2% Chrysotile asbestos**. Black mastic was also analyzed as part of the sample set and was found to contain **3% Chrysotile asbestos**.

  Asbestos-containing VFT-05 was observed within the North-West Boiler Room, and was found to range from GOOD to POOR condition at the time of the assessment. Approximately 2 SF was observed in POOR condition on the stairs.

4.1.7 Asbestos Cement Products "Transite" (Non-Friable)

Asbestos-containing transite cement products in the form of transite pipes were identified within the crawl space of the North-West Laundry Room at the time of the assessment

Four (4) transite pipes acting as casing for conduit were observed within the crawl space of the North-West Laundry Room. A visual assessment indicates that the pipes continue to the exterior of the building. Therefore, there are suspect transite pipes buried on the north side of the North-West Laundry Room.

No samples were collected of the transite pipes as sampling could damage the integrity of the material. Transite is historically known to contain Chrysotile, Amosite and/or Crocidolite Asbestos. Visual identification of this material is usually reliable although a non-asbestos equivalent is also available. The material is assumed to contain asbestos until sampling proves otherwise.

The transite pipes located within the North-West Laundry Room were observed to be in GOOD condition at the time of the assessment.

4.1.8 Drywall Joint Compound (DJC) (Potentially Friable)

Asbestos-containing drywall joint compound was identified within the building at the time of the assessment.

Interior drywall finishes were present in the form of wall and ceiling finishes throughout the majority of the complex.

Seven (7) representative samples (Sample Set A09:A-G) of drywall joint compound were collected and analyzed for determination of asbestos content. Analysis of Sample Set A09 found that six (6) of the samples contained between **2-3% Chrysotile asbestos**. No asbestos was detected in samples A09-B. However, Ontario Regulation 278/05 requires homogenous material to be considered as an asbestos-containing material if one or more samples are found to contain asbestos. As such, all drywall joint compound is to be considered as asbestos-containing until sampling proves otherwise.

Asbestos-containing drywall joint compound was observed throughout the complex, and was found to range from GOOD to POOR condition at the time of the assessment. Drywall with joint compound applied was observed in FAIR condition within the following locations:

- Unit 244 Bedroom (~4 SF)
- Unit 262 Bedroom (~1 SF)
- North-West Boiler Room (~5 SF)

Approximately 10 SF of the drywall ceiling was observed in POOR condition within the South-East Boiler Room and debris was noted on the floor.

Should drywall joint compound be identified in rooms not accessed by Maple, collection and analysis of the drywall joint compound is required.

4.1.9 Plaster (Potentially Friable)

No plaster finishes were observed within the complex.

Should plaster finishes be identified in rooms not accessed by Maple, collection and analysis of the plaster is required.

4.1.10 Vermiculite (Friable)

No vermiculite insulation was observed to be present within the complex at the time of the assessment. It should be noted that loose fill vermiculite insulation can often be present within voids of masonry and possibly some pre-manufactured building components that would not be identified during the course of this assessment.

4.1.11 Other

- Black Tar Paper

  Black tar paper was observed to be applied to the walls within the majority of the crawl spaces within the complex.

  Three (3) representative samples (Sample Set A06:A-C) of black tar paper were collected and analyzed for asbestos. Analysis of Sample Set A06 found that the samples do not contain asbestos.

- **Fire Door**

  A fire proof door was observed at the entrance to the South-East Boiler Room. No samples of the insulation within the door were collected as the material is sealed within the door. This material should be assumed to contain asbestos until sampling proves otherwise.

- **Blown-in Fibreglass Insulation**

  Blown-in fibreglass insulation was observed within the attic spaces of each Unit. No samples of the insulation were collected, as the material is not suspected to contain asbestos.

4.2 Lead

The following is a brief discussion of the extent to which suspect lead-containing paints and materials were identified in the areas surveyed. The sample numbers refer to the Laboratory Analysis Report presented as Appendix II and summarised in Table 3 below. A total of four (4) samples were collected for determination of lead content and submitted to the laboratory for analysis.

Table 3 - Summary of Analysis of Lead-in-Paint Samples

Sample No.	Sample Location	Sample Description	Lead (%)
Pb-01	Unit 1293 Kitchen	Off-White Paint	0.023%
Pb-02	Unit 238 Living Room	Pink Paint	0.034%
Pb-03	Unit 238 Kitchen	Light Green Paint	0.010%
Pb-04	South-East Laundry Room	White Paint	0.097%

No regulations currently exist in Ontario defining the lower limit of lead-containing material. The Ontario Ministry of Labour (MOL) has issued a guideline for lead abatement, entitled Guideline – Lead on Construction Projects (2004) which is considered enforceable. The Guideline does not specify what constitutes a material as "lead-containing". Instead, it outlines procedures based on the concentration of airborne lead encountered during removal, as well as provides procedures and/or specific operations for lead-containing material removal. However, the Environmental Abatement Council of Ontario (EACO) Lead Guideline for Construction, Renovation, Maintenance or Repair document classifies paint as either Low-Level, Lead-Containing, or Lead-Based as follows:

TABLE 4 EACO Classification of Lead Paint	
Concentration of Lead (%)	**Definition**
0.1 or less	Low Level Lead (Virtually Safe)
Greater than 0.1 but less than 0.5	Lead-Containing
0.5 or greater	Lead-Based

Based on these criteria and the results of the sample analysis, all paints were found to be below the limit of detection and are considered to be "virtually safe".

It should be noted that lead may also be present in wiring connectors, electric cable sheathing, solder joints on copper piping, ceramic glazes, lead sheeting, masonry mortar, and as sub-surface layers to the most recent paint layers currently applied, where present in the surveyed area.

4.3 Mercury

Mercury vapour is present in all fluorescent light tubes.

4.4 Silica

Free crystalline silica, present as common construction sand, is present in all concrete and masonry products where present in the complex.

4.5 Isocyanates

Free isocyanate compounds would not be expected to be found in a non-manufacturing facility.

4.6 Vinyl Chloride Monomer

Vinyl chloride monomer would not be expected to be found in a non-manufacturing facility.

4.7 Benzene

Benzene would not be expected to be found in a non-manufacturing facility.

4.8 Acrylonitrile

Acrylonitrile would not be expected to be found in a non-manufacturing facility.

4.9 Coke Oven Emissions

Coke oven emissions would not be expected to be found in a non-manufacturing facility.

4.10 Arsenic

Arsenic would not be expected to be found in a non-manufacturing facility.

4.11 Ethylene Oxide

Ethylene oxide would not be expected to be found in a non-manufacturing facility.

4.12 Mould

Staining was observed on the wood sheathing and blown-in fibreglass batt insulation within the attic spaces of Units 1293, 238 and 244.

Mould amplification sites were observed on the fibreglass panel within the Crawl Space of Unit 1293, and on the wood sheathing within the Attic of the South-East Laundry Room.

Minor staining was observed on drywall ceilings throughout the complex. Additionally, minor staining was found on the ceilings within the North-West and South-West Boiler Rooms and below the window within the Living Room in Unit 238.

It is possible that mould growth is present in concealed areas such as wall or ceiling cavities, pipe chases, etc. or in areas not currently assessed by Maple. The client should notify Maple should any water damage or suspect mould growth be discovered.

4.13 Polychlorinated Biphenyls

When removing light fixture ballasts, all ballasts not clearly marked as "non-PCB" on the label should be separated, handled and disposed of as PCB-containing or inspected by competent persons to ascertain PCB content.

5.0 RECOMMENDATIONS

5.1 Asbestos

General Recommendations

It is important to note that due to the presence of solid wall and ceiling systems, the assessment was not able to confirm or deny the presence of ACM within wall and ceiling cavities. The presence of concealed ACM should be assumed as well as within Units that were not accessible during the assessment. It is possible that ACM is present that was not identified in this report. Further, caution should be taken when entering or demolishing solid building finishes as ACM may be present.

The assessment confirmed the presence of ACM mechanical insulations within the buildings. Should any proposed renovations likely cause disturbance of the mechanical insulations, the materials would require removal using Type 2, Type 3 or Glove Bag Asbestos procedures as appropriate for the work being performed.

If the asbestos-containing vinyl floor tiles (and associated mastic) are likely to be disturbed, the tiles are to be removed using Type 1 Asbestos procedures (provided no power tools are used and the material is wetted). The use of power tools would require Type 3 Asbestos procedures.

Removal or disturbance of transite cement products requires the use of Type 1 Asbestos procedures (provided no power tools are used and the material is wetted). If power tools are required Type 3 Asbestos procedures need be applied.

Asbestos-containing drywall joint compound is present within the building. Removal or disturbance of ACM drywall less than $1m^2$ will require the use of Type 1 Asbestos procedures, greater than $1m^2$ Type 2 Asbestos procedures.

Specific Recommendations

Asbestos-containing materials were found to be present within the building at the time of the assessment. Therefore an Asbestos Management Program (AMP) is required for this Housing Complex.

It should be noted that the assessment was limited in scope to four (4) Residential Units and Common Areas. Additional remedial work may be required in other units not identified herein.
For compliance with Regulation 278/05 the following remedial action is required:

Using Type 1 Asbestos procedures repair all ACM in FAIR condition at the locations listed in the table below:

Unit & Room Name	Building Material	Building System	Description	Quantity
Unit 244 Bedroom	Drywall	Wall	Above Doorway	1 SF
Unit 262 Bedroom	Drywall	Wall	Above Doorway	1 SF
North-West Boiler Room	Drywall	Ceiling	Holes in Drywall	5 SF

Using Type 1 Asbestos procedures, remove all ACM in POOR condition at the locations listed in the table below:

Unit & Room Name	Building Material	Building System	Description	Quantity
Unit 1293 Bedroom	VFT-01	Floor	Damage Within the Closet	10 SF
Unit 238 Bedroom	VFT-02	Floor	Tile Debris Within the Closet	1 SF
Unit 262 Crawl Space	VFT-04	Floor	Damage to Backside of Hatch	7 SF
North-West Boiler Room	VFT-05	Floor	Damage to Edging	2 SF
South-East Boiler Room	Drywall	Ceiling	In Corner of Room	10 SF

Using Type 2 Asbestos procedures, repair all ACM in FAIR condition at the locations listed in the table below:

Unit & Room Name	Building Material	Building System	Quantity
Unit 262 Crawl Space	Parging Cement	Pipe Fittings	15 Each
North-West Laundry Room Crawl Space	Parging Cement	Pipe Fitting	1 Each

Using Type 2 Asbestos procedures, clean-up all ACM in FAIR condition at the location listed in the table below:

Unit & Room Name	Building Material	Building System	Description	Quantity
South-East Boiler Room	Drywall	Ceiling	Drywall Debris on Floor	10 SF

Using Type 2 Asbestos procedures remove all ACM in POOR condition at the locations listed in the table below:

Unit & Room Name	Building Material	Building System	Quantity
North-West Laundry Room Crawl Space	Parging Cement	Pipe Fitting	1 Each

All remaining asbestos-containing materials identified within the assessed portions of the facility were observed to be in GOOD condition and therefore no additional immediate recommendations are warranted.

5.2 Lead

Based on the Laboratory Analysis Report for the paint samples collected, all paints were found to be below the limit of detection and are considered to be virtually safe.

Low Level Lead paints (0.1% or less) are considered virtually safe provided that;

- airborne lead concentrations are kept below 0.05 mg/m^3
- general dust suppression and worker hygiene procedures are utilized
- torching or other activities that create fumes are not completed

5.3 Mercury

No immediate recommendations are warranted. Follow appropriate procedures if disturbed or removed.

5.4 Silica

No immediate recommendations are warranted. Follow proper respiratory protection and worker safety procedures as outlined in the Ministry of Labour's Guideline- Silica on Construction Projects, 2004, if disturbed or removed.

5.5 Mould

Using Level 2 mould remediation procedures (at a minimum), remove and replace or clean the stained wood sheathing and fibreglass batt insulation within the attic spaces of Units 1293, 238 and 244. Level 1 mould remediation procedures may be performed by building maintenance staff.

Using Level 2 mould remediation procedures, remove the mould present on the fibreglass panel within the Crawl Space of Unit 1293, and the mould present within the Attic of the South-East Laundry Room.

Additionally, monitor the staining to the ceilings within the North-West and South-West Boiler Rooms and the staining below the window within the Living Room in Unit 238.

5.6 Polychlorinated Biphenyls

When removing light fixture ballasts, all ballasts not clearly marked as "non-PCB" on the label should be separated, handled and disposed of as PCB-containing or inspected by competent persons to ascertain PCB content.

6.0 LIMITATIONS

Due to the nature of building construction some limitations exist as to the possible thoroughness of an asbestos inventory. The field observations, measurements, and analysis are considered sufficient in detail and scope to form a reasonable basis for the findings presented in this report. MAPLE warrants that the findings and conclusions contained herein have been made in accordance with generally accepted evaluation methods in the industry and applicable regulations at the time of the performance of the inventory.

It is possible that conditions may exist which could not be reasonably identified within the scope of the inventory or which were not apparent during the site investigation. MAPLE believes that the information collected during the inventory period concerning the property is reliable. No other warranties are implied or expressed.

6.1 Scope of Activity

This report is based upon the application of scientific principles and professional judgement to certain facts with resultant subjective interpretations.

6.2 Limitation of Use of This Report

The Client acknowledges this report has been prepared for the exclusive use of Client and agrees that this report may not be used or relied upon by any third parties.

Any use not authorized by the Region of Halton and Maple which any third party makes of this report, or any reliance on or decision(s) to be made based on it, are the responsibility of such third party(ies) and without any liability of any nature to the Region of Halton and Maple. The Region of Halton and Maple accept no responsibility for damages, if any, suffered by any third party as a result of decisions made or actions based on this report.

Sincerely,

MAPLE ENVIRONMENTAL INC.
Environment, Health and Safety Consultants

Prepared By:	**Reviewed By:**
Samantha Russo	Elaine Skinner
Project Technologist	*Project Technologist*

C:\Users\Samantha\Google Drive\16000 - 16099\16023 Halton Region, Rotary Gardens, Dsub\16023, Halton Region, Rotary Gardens, DSUB Report.doc

APPENDIX I

BULK SAMPLE ANALYSIS RESULTS (ASBESTOS)

emcscientific INCORPORATED

Laboratory Analysis Report

To:

Elaine Skinner / Samantha Russo
Maple Environmental Inc.
482 South Service Road East, Suite 116
Oakville, Ontario
L6J 2X6

EMC LAB REPORT NUMBER: A28472
Job/Project Name: Halton Region **Job No:** 16023
Analysis Method: Polarized Light Microscopy – EPA 600 **Number of Samples:** 31
Date Received: Dec 15/16 **Date Analyzed:** Dec 16&19/16 **Date Reported:** Dec 20/16
Analysts: Victoria Szlachta, *Analyst* and Arabee Sathiaseelan, *Assistant Laboratory Manager*

Client's Sample ID	Lab Sample No.	Description/Location	Sample Appearance	SAMPLE COMPONENTS (%)			
				Asbestos Fibres		Non-asbestos Fibres	Non-fibrous Material
A01-A	A28472-1	12x12 Off-White with Beige Flecks VFT (Unit 1293 Living Room)	2 Phases: a) Beige, vinyl floor tile b) Black, mastic	 **ND** **ND**			 100 100
A01-B	A28472-2	12x12 Off-White with Beige Flecks VFT (Unit 1293 Bedroom Closet)	2 Phases: a) Beige, vinyl floor tile b) Black, mastic	 **ND** **ND**			 100 100
A01-C	A28472-3	12x12 Off-White with Beige Flecks VFT (Unit 1293 Bedroom Closet)	2 Phases: a) Beige, vinyl floor tile b) Black, mastic	 **ND** **ND**			 100 100
A02-A	A28472-4	9x9 White with Green & Blue Spots VFT (Unit283 Bedroom Closet)	2 Phases: a) Off-white, vinyl floor tile b) Brown, mastic	 **Chrysotile** **ND**	 **2**		 98 100
A02-B	A28472-5	9x9 White with Green & Blue Spots VFT (Unit283 Bedroom Closet)	2 Phases: a) NA b) Brown, mastic	 **NA** **ND**			 100
A02-C	A28472-6	9x9 White with Green & Blue Spots VFT (Unit283 Bedroom Closet)	2 Phases: a) NA b) Brown, mastic	 **NA** **ND**			 100
A03-A	A28472-7[6]	12x12 Off-White with Grey Flecks VFT (Unit 262 Bedroom Closet)	2 Phases: a) Off-white, vinyl floor tile b) Black, mastic	 **ND** **ND**			 100 100
A03-B	A28472-8	12x12 Off-White with Grey Flecks VFT (Unit 262 Bedroom Closet)	2 Phases: a) Off-white, vinyl floor tile	 **ND**			 100

emcscientific INCORPORATED

Laboratory Analysis Report

EMC LAB REPORT NUMBER: A28472
Client's Job/Project No.: 16023
Analysts: Victoria Szlachta, *Analyst* / Arabee Sathiaseelan, *Assistant Laboratory Manager*

Client's Sample ID	Lab Sample No.	Description/Location	Sample Appearance	SAMPLE COMPONENTS (%)			
				Asbestos Fibres		Non-asbestos Fibres	Non-fibrous Material
			b) Black, mastic	**Chrysotile**	**1**		99
A03-C	A28472-9	12x12 Off-White with Grey Flecks VFT (Laundry Room SE)	2 Phases: a) Off-white, vinyl floor tile b) NA	 **ND** **NA**			100
A04-A	A28472-10	12x12 Beige with Brown Streaks VFT (Unit 262 Bedroom Closet)	2 Phases: a) Beige, vinyl floor tile b) Black, mastic	 **Chrysotile** **Chrysotile**	 **3** **1**		 97 99
A04-B	A28472-11	12x12 Beige with Brown Streaks VFT (Unit 262 Bedroom Closet)	NA	**NA**			
A04-C	A28472-12	12x12 Beige with Brown Streaks VFT (Unit 262 Bedroom Closet)	NA	**NA**			
A05-A	A28472-13	9x9 Beige with Dark Brown Streaks VFT (Boiler Room NW)	2 Phases: a) Beige, vinyl floor tile b) Black, mastic	 **Chrysotile** **Chrysotile**	 **2** **3**		 98 97
A05-B	A28472-14	9x9 Beige with Dark Brown Streaks VFT (Boiler Room NW)	NA	**NA**			
A05-C	A28472-15	9x9 Beige with Dark Brown Streaks VFT (Boiler Room NW)	NA	**NA**			
A06-A	A28472-16	Black Tar Paper (Crawl Space Within Unit 1293)	Black, tar	**ND**		5	95
A06-B	A28472-17	Black Tar Paper (Crawl Space Within Unit 238)	Black, tar	**ND**		5	95
A06-C	A28472-18	Black Tar Paper (Crawl Space Within	Black, tar	**ND**		5	95

emcscientific INCORPORATED

Laboratory Analysis Report

EMC LAB REPORT NUMBER: A28472
Client's Job/Project No.: 16023
Analysts: Victoria Szlachta, *Analyst* / Arabee Sathiaseelan, *Assistant Laboratory Manager*

Client's Sample ID	Lab Sample No.	Description/Location	Sample Appearance	SAMPLE COMPONENTS (%)			
				Asbestos Fibres		Non-asbestos Fibres	Non-fibrous Material
		Unit 238)					
A07-A	A28472-19	Parging Cement (Crawl Space Within Unit 262)	Grey, parging cement	**Chrysotile**	**50**	20	30
A07-B	A28472-20	Parging Cement (Crawl Space Within Unit 262)	NA	**NA**			
A07-C	A28472-21	Parging Cement (Crawl Space Within Unit 262)	NA	**NA**			
A08-A	A28472-22	Cellulose Pipe Straight (Crawl Space Within Unit 262)	2 Phases: a) Brown, fibrous material b) Black, fibrous material with tar	 **ND** **ND**		 90 60	 10 40
A08-B	A28472-23	Cellulose Pipe Straight (Crawl Space Within Unit 262)	2 Phases: a) Brown, fibrous material b) Black, fibrous material with tar	 **ND** **ND**		 90 60	 10 40
A08-C	A28472-24	Cellulose Pipe Straight (Crawl Space Within Laundry Room NW)	2 Phases: a) Brown, fibrous material b) Black, fibrous material with tar	 **ND** **ND**		 90 60	 10 40
A09-A	A28472-25[7]	Drywall Joint Compound (Unit 144 Bedroom)	2 Phases: a) Beige, joint compound b) White and off-white, joint compound	 **Chrysotile** **ND**	 **2**		 98 100
A09-B	A28472-26	Drywall Joint Compound (Unit 262 Bedroom)	White and off-white, joint compound	**ND**			100
A09-C	A28472-27	Drywall Joint Compound (Unit 244 Kitchen)	Beige, joint compound	**Chrysotile**	**3**		97

emcscientific INCORPORATED

Laboratory Analysis Report

EMC LAB REPORT NUMBER: A28472
Client's Job/Project No.: 16023
Analysts: Victoria Szlachta, *Analyst* / Arabee Sathiaseelan, *Assistant Laboratory Manager*

Client's Sample ID	Lab Sample No.	Description/Location	Sample Appearance	SAMPLE COMPONENTS (%)			
				Asbestos Fibres		Non-asbestos Fibres	Non-fibrous Material
A09-D	A28472-28	Drywall Joint Compound (Unit 238 Bedroom)	Beige, joint compound	**Chrysotile**	**3**		97
A09-E	A28472-29	Drywall Joint Compound (Laundry Room NW)	Beige, joint compound	**Chrysotile**	**2**		98
A09-F	A28472-30	Drywall Joint Compound (Boiler Room SE)	Off-white, joint compound	**Chrysotile**	**3**		97
A09-G	A28472-31	Drywall Joint Compound (Boiler Room NW)	Off-white, joint compound	**Chrysotile**	**2**		98

Note:
1. Bulk samples are analyzed using Polarized Light Microscopy (PLM) and dispersion staining techniques. The analytical procedures are in accordance with EPA 600/R-93/116 method.
2. The results are only related to the samples analyzed. **ND** = None Detected (no asbestos fibres were observed), **NA** = Not Analyzed (analysis stopped due to a previous positive result).
3. This report may not be reproduced, except in full without the written approval of EMC Scientific Inc. This report may not be used by the client to claim product endorsement by NVLAP or any other agency of the U.S. Government.
4. The Ontario Regulatory Threshold for asbestos is 0.5%. The limit of quantification (LOQ) is 0.5%.
5. Vinyl floor tiles may contain very fine asbestos fibres which the PLM method cannot detect. TEM analysis may be necessary to confirm the absence of asbestos.
6. Phase b) is small in size.
7. Phase a) is small in size.

APPENDIX II

BULK SAMPLE ANALYSIS RESULTS (LEAD)

EMSL Canada Inc.
2756 Slough Street, Mississauga, ON L9T 5N4
Phone/Fax: 289-997-4602 / (289) 997-4607
http://www.EMSL.com torontolab@emsl.com

EMSL Canada Or	551613414
CustomerID:	55MAPL78
CustomerPO:	16023
ProjectID:	

Attn: **Elaine Skinner**
Maple Environmental, Inc.
482 South Service Road East
Suite 116
Oakville, ON L6J 2X6

Phone:	(905) 257-4408
Fax:	(905) 257-8865
Received:	12/16/16 1:20 PM
Collected:	12/15/2016

Project: **16023: HALTON REGION**

Test Report: Lead in Paint Chips by Flame AAS (SW 846 3050B/7000B)*

Client Sample Description	*Lab ID*	*Collected*	*Analyzed*	*Lead Concentration*
PB-01	*551613414-0001*	12/15/2016	12/19/2016	0.023 % wt
	Site: OFF-WHITE PAINT (UNIT 1293 KITCHEN)			
PB-02	*551613414-0002*	12/15/2016	12/19/2016	0.034 % wt
	Site: PINK PAINT (UNIT 238)			
PB-03	*551613414-0003*	12/15/2016	12/19/2016	0.010 % wt
	Site: LIGHT GREEN PAINT (UNIT 238 KITCHEN)			
PB-04	*551613414-0004*	12/15/2016	12/19/2016	0.097 % wt
	Site: WHITE PAINT (S-E LAUNDRY)			

Rowena Fanto, Lead Supervisor
or other approved signatory

*Analysis following Lead in Paint by EMSL SOP/Determination of Environmental Lead by FLAA. Reporting limit is 0.010 % wt based on the minimum sample weight per our SOP. Unless noted, results in this report are not blank corrected. This report relates only to the samples reported above and may not be reproduced, except in full, without written approval by EMSL. EMSL bears no responsibility for sample collection activities. Samples received in good condition unless otherwise noted. "<" (less than) result signifies that the analyte was not detected at or above the reporting limit. Measurement of uncertainty is available upon request. The QC data associated with the sample results included in this report meet the recovery and precision requirements unless specifically indicated otherwise. Definitions of modifications are available upon request.

Samples analyzed by EMSL Canada Inc. Mississauga, ON A2LA Accredited Environmental Testing Cert #2845.08

Initial report from 12/23/2016 09:38:15

Schedule 4

Asbestos Assessment

Rotary Gardens
1285-1299 Sedgewick Crescent
and 234-274 Woodside Drive,
Oakville, Ontario, L6L 1X7

Prepared for:

Halton Region

1151 Bronte Road
Oakville, Ontario, L6M 3L1

August 30, 2023

Pinchin File: 320580.001

© 2023 Pinchin Ltd.

Issued to:	**Halton Region**
Issued on:	**August 30, 2023**
Pinchin File:	**320580.001**
Issuing Office:	**Hamilton, ON**

Author: Justin Appleby, ADip.T. (Arch)
Project Technologist
289.925.3875
jappleby@pinchin.com

Reviewer: Leslie Heywood, BEng Mgt
Senior Project Manager
289.237.4294
lheywood@pinchin.com

© 2023 Pinchin Ltd.

EXECUTIVE SUMMARY

Halton Region (Client) retained Pinchin Ltd. (Pinchin) to conduct an asbestos building materials assessment of Rotary Gardens located at 1285-1299 Sedgewick Crescent and 234-274 Woodside Drive, Oakville, Ontario, L6L 1X7. The assessment was performed on June 2, 2023.

The objectives of the assessment were to document the locations of asbestos-containing building materials, evaluate their condition and develop corrective action plans as required for the purposes of long-term management. The results of this assessment are not intended for construction, renovation, demolition, or project tendering purposes.

SUMMARY OF FINDINGS

Asbestos-containing materials (ACM) are present as follows:

- Drywall joint compound
- Vinyl floor tiles

SUMMARY OF RECOMMENDATIONS

The following is a summary of significant recommendations; refer to the body of the report for detailed recommendations:

1. Prepare an Asbestos Management Program (AMP).
2. Perform a reassessment of asbestos materials on an annual basis.
3. Perform a pre-construction assessment and remove all ACM prior to alteration or maintenance work if ACM may be disturbed by the work.
4. Follow appropriate safe work procedures when handling or disturbing asbestos.

This Executive Summary is subject to the same standard limitations as contained in the report and must be read in conjunction with the entire report.

© 2023 Pinchin Ltd.

TABLE OF CONTENTS

APPENDICES

© 2023 Pinchin Ltd.

1.0 INTRODUCTION AND SCOPE

Halton Region (Client) retained Pinchin Ltd. (Pinchin) to conduct an asbestos building materials assessment of Rotary Gardens located at 1285-1299 Sedgewick Crescent and 234-274 Woodside Drive, Oakville, Ontario, L6L 1X7.

Pinchin performed the assessment on June 2, 2023. The surveyor was accompanied by a representative of the Client during the assessment. The assessed area was occupied at the time of the assessment.

The objectives of the assessment were to document the locations of asbestos-containing building materials, evaluate their condition and develop corrective action plans as required. This assessment is only to be used for the purposes of long-term management and routine maintenance. The results of this assessment are not to be used for construction, renovation, demolition, or project tendering purposes.

1.1 Scope of Assessment

The assessment was performed to establish the location and type of asbestos building materials incorporated in the structure(s) and its finishes. The **assessed area** consisted of all common areas of the site (e.g., corridors, mechanical rooms, storage areas, etc.), excluding the building exterior (e.g., exterior cladding and roof) and a representative selection of the tenant units (approximately 10%).

2.0 METHODOLOGY

Pinchin conducted a room-by-room assessment (rooms, corridors, service areas, etc.) to identify the asbestos-containing building materials as defined in the scope.

The assessment was limited to non-intrusive testing. Concealed spaces such as those above solid ceilings and within shafts and pipe chases were accessed via existing access panels only. Demolition of walls, solid ceilings, structural items, interior finishes, or exterior building finishes, to determine the presence of concealed materials was not conducted.

Demolition of masonry block walls (core holes) was not conducted to investigate for loose fill vermiculite insulation. Sampling of roofing materials was not conducted.

For further details on the methodology including test methods, refer to Appendix III.

3.0 BACKGROUND INFORMATION

3.1 Building Description

Description Item	Details
Use	Housing
Number of Floors	The buildings are 1 storey.

© 2023 Pinchin Ltd.

Description Item	Details
Total Area	The total area of the buildings is 18,000 square feet.
Year of Construction	The buildings were constructed in 1956.

3.2 Inaccessible Locations

The following rooms or areas were not accessible and are therefore not included in the report:

Area or Room	Reason
Crawl Space	Inaccessible due to stored tenant items.

4.0 FINDINGS

The following section summarizes the findings of the assessment and provides a general description of the asbestos-containing materials (ACM) identified and their locations. For details on approximate quantities, condition, friability, accessibility, and locations of asbestos materials; refer to the Asbestos Material Summary Report and All Data Report in Appendices V and VI.

4.1 Pipe Insulation

Pipes observed are insulated with fibreglass, or other non-asbestos insulation such as mineral fibre or elastomeric foam insulation (photo 1).

Pipes insulated with asbestos-containing insulations and may be present in inaccessible spaces such as above solid ceilings, in chases, in column enclosures and within shafts.

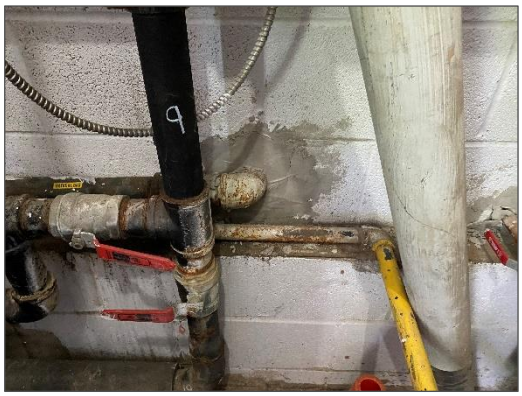


Photo 1

4.2 Mechanical Equipment Insulation

Mechanical equipment (i.e., boilers and hot water tanks) are either uninsulated or insulated with non-asbestos fibreglass (photo 1).

© 2023 Pinchin Ltd.

Photo 1

4.3 Drywall Joint Compound

Drywall joint compound contains asbestos (photo 1). The following table presents a summary of drywall joint compound sampled:

Sample Locations	Sample Number	Asbestos Type
North Boiler Room (Location 6)	S0001A-C	Chrysotile
South Boiler Room (Location 5)	S0005A-C	Chrysotile
South Boiler Room (Location 5)	S0006A-C	Chrysotile
Unit 258 (Location 1)	S0010A-C	Chrysotile
Unit 1293 (Location 3)	S0011A-C	Chrysotile
Unit 1297 (Location 4)	S0012A-C	Chrysotile

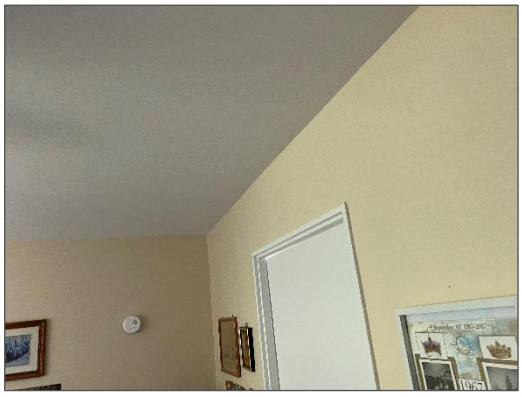


Photo 1

4.4 Vinyl Floor Tiles

Vinyl floor products are present as follows:

© 2023 Pinchin Ltd.

Size, Pattern, Colour, and Photo #	Sample Locations	Sample Number	Asbestos Type (tile)	Asbestos Type (mastic)
12”x12”, beige with white fleck, photo 1	North Boiler Room (Location 6)	S0004A-C	None detected	None detected
9”x9”, white with brown streaks, photo 2	South Boiler Room (Location 5)	S0008A-C	Chrysotile	Chrysotile

Photo 1

Photo 2

4.5 Firestopping

Purple firestopping (sealant), present at pipe and conduit penetrations in the North Boiler Room (Location 6) does not contain asbestos (samples S0002A-C, photo 1).

Firestopping (cementitious), present at pipe and conduit penetrations in the South Boiler Room (Location 5) does not contain asbestos (samples S0009A-C, photo 2).

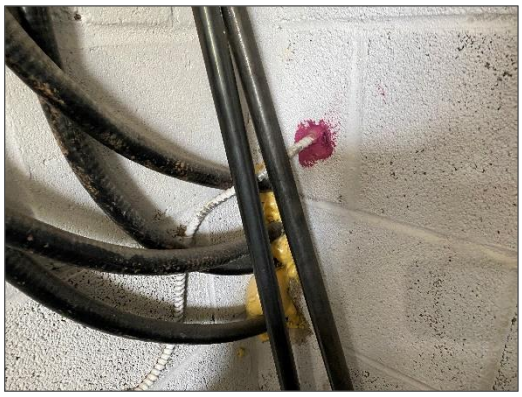


Photo 1

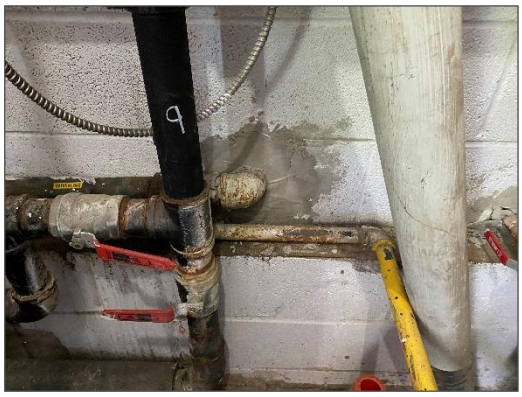


Photo 2

© 2023 Pinchin Ltd.

4.6 Other Building Materials

The following is a summary of other materials sampled, for a complete list of locations, refer to Appendix V.

Description and Photo #	Sample Location (Location #)	Sample Number	Asbestos
Paint on concrete block, photo 1	North Boiler Room (Location 6)	S0003A-C	None detected
Paint on concrete block, photo 2	South Boiler Room (Location 5)	S0007A-C	None detected

Photo 1

Photo 2

4.7 Excluded Asbestos Materials

The following is a list of materials which may contain asbestos and was excluded from the assessment. These materials are presumed to contain asbestos until otherwise proven by sampling and analysis:

- Roofing felts and tar, mastics
- Floor levelling compound
- Electrical components
- Mechanical packing, ropes and gaskets
- Vermiculite
- Adhesives and duct mastics
- Caulking and putties
- Paper products
- Soffit and fascia boards
- Fire resistant doors

© 2023 Pinchin Ltd.

- Vibration dampers on HVAC equipment
- Ropes and gaskets in cast-iron bell and spigot joints
- Sealants on pipe threads

5.0 RECOMMENDATIONS

5.1 General

Perform a detailed intrusive assessment prior to building renovation or demolition operations. The assessment should include destructive testing (e.g., coring and/or removal of building finishes and components), and other hazardous materials (lead, mercury, PCBs, mould, etc.) and materials not tested in this study (e.g., roofing materials, caulking, mastics).

5.2 Remedial Work

The following remedial work is recommended.

Material, Quantity, Condition, and Photo #	Location	Recommended Procedure
9”x9”, white with brown streaks, 5 square feet, poor condition, photo 1	South Boiler Room (Location 5)	Remove and dispose following Type 1 asbestos procedures.

Photo 1

5.3 On-going Management and Maintenance

The following recommendations are made regarding on-going management and maintenance work involving the asbestos materials identified.

5.3.1 Asbestos

Prepare an Asbestos Management Program (AMP). The AMP should address and document, written work practices, worker training, notifications, policies, and responsibilities.

© 2023 Pinchin Ltd.

Perform a reassessment of asbestos materials on an annual basis.

Remove asbestos-containing materials (ACM) prior to alteration or maintenance work if ACM may be disturbed by the work. Follow appropriate asbestos precautions for the classification of work being performed.

Update the asbestos inventory upon completion of the abatement and removal of asbestos-containing materials and any other relevant findings.

6.0 TERMS AND LIMITATIONS

This work was performed subject to the Terms and Limitations presented or referenced in the proposal for this project.

Information provided by Pinchin is intended for Client use only. Pinchin will not provide results or information to any party unless disclosure by Pinchin is required by law. Any use by a third party of reports or documents authored by Pinchin or any reliance by a third party on or decisions made by a third party based on the findings described in said documents, is the sole responsibility of such third parties. Pinchin accepts no responsibility for damages suffered by any third party as a result of decisions made or actions conducted. No other warranties are implied or expressed.

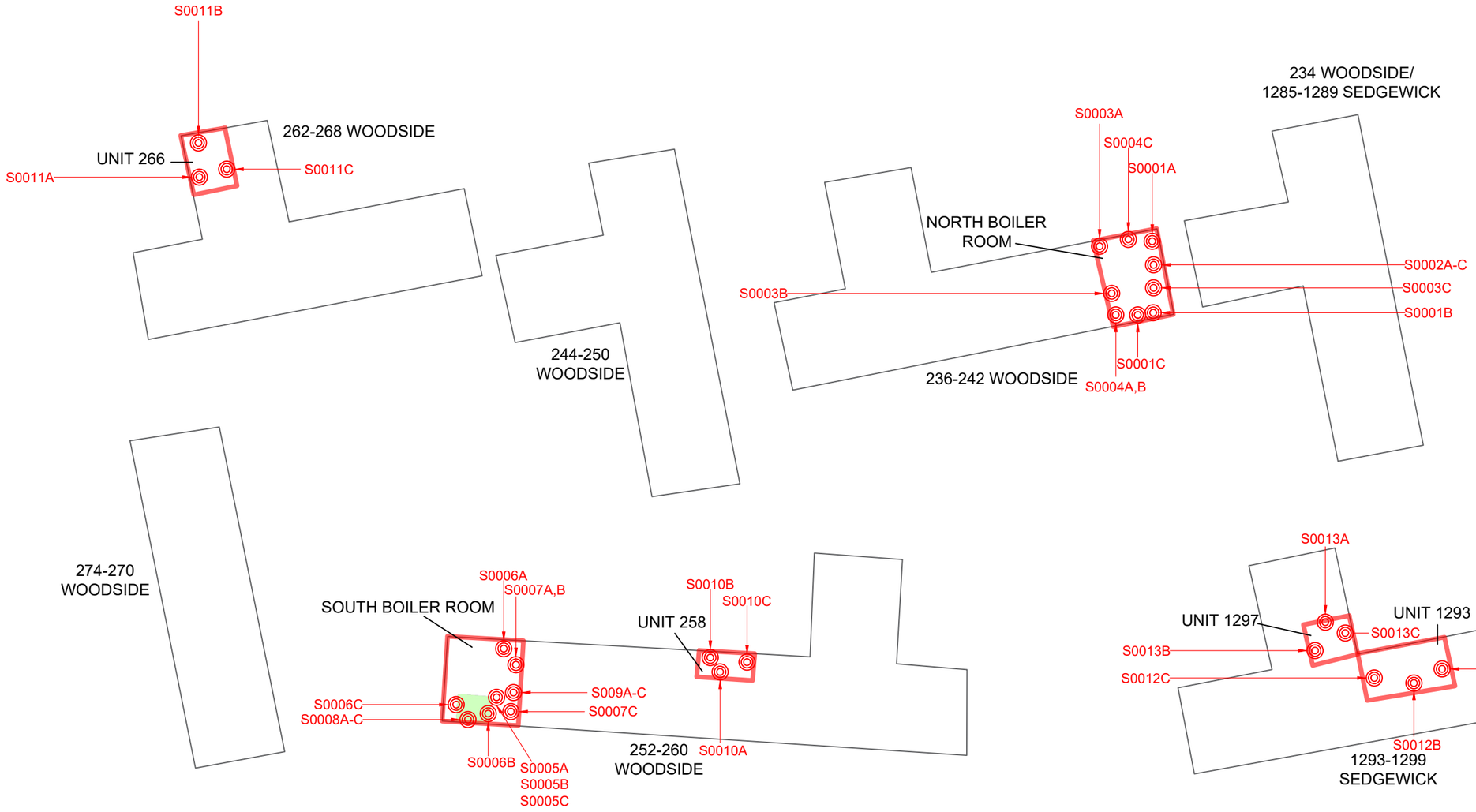
7.0 REFERENCES

The following legislation and documents were referenced in completing the assessment and this report:

1. Asbestos on Construction Projects and in Buildings and Repair Operations, Ontario Regulation 278/05.
2. Designated Substances, Ontario Regulation 490/09.
3. Ministry of the Environment Regulation, R.R.O. 1990 Reg. 347 as amended.

© 2023 Pinchin Ltd.

APPENDIX I
Drawings



LEGEND

- PINCHIN LOCATION NUMBER
- ASBESTOS BULK SAMPLE
- SURVEY BOUNDARY/ASSESSED AREA

ASBESTOS-CONTAINING MATERIALS:

- VINYL FLOOR TILES & MASTIC

FOR CLARITY, THE FOLLOWING ASBESTOS-CONTAINING MATERIALS, ARE PRESENT IN THE ASSESSED AREA, BUT HAVE NOT BEEN HATCHED ON THE DRAWING:

- DRYWALL

CRAWL SPACE UNDER EACH UNIT NAR NOT ASSESSED

NOT ALL KNOWN OR SUSPECTED ASBESTOS-CONTAINING BUILDING MATERIALS MAY BE DEPICTED ON THE DRAWING. REFER TO THE ASBESTOS ASSESSMENT REPORT FOR A COMPLETE LIST OF KNOWN AND SUSPECTED ASBESTOS-CONTAINING BUILDING MATERIALS.

LEGEND IS COLOUR DEPENDENT. NON-COLOUR COPIES MAY ALTER INTERPRETATION.

BASE PLAN PROVIDED BY CLIENT.

PINCHIN

PROJECT NAME:
ASBESTOS ASSESSMENT

CLIENT NAME:
HALTON REGION

PROJECT LOCATION:
ROTARY GARDENS 1285-1299 SEDGEWICK CRESCENT AND 234-274 WOODSIDE DRIVE, OAKVILLE ONTARIO

FIGURE NAME:
SITE PLAN

PROJECT NUMBER:	SCALE:
320580.001	NOT TO SCALE
DRAWN BY: NM	REVIEWED BY: JA
DATE: AUGUST 2023	FIGURE NUMBER: 1 OF 1

APPENDIX II

Asbestos Analytical Certificates

Bulk Asbestos Analysis

By Polarized Light Microscopy
EPA Method: 600/R-93/116 and
40 CFR, Part 763, Subpart E, App.E

NVLAP LAB CODE 200664-0

Lab ID # 173190

Customer: Pinchin Ltd.
6-875 Main St West, Suite 200
Hamilton, ON L8S 4R9

Attn: Justin Appleby
Leslie Heywood

Project: Halton Building 30 Rotary Gardens

Lab Order ID: **10024818**
Analysis: PLM
Date Received: 06/05/2023
Date Reported: 06/13/2023
Date Amended: 06/13/2023

Sample ID / *Lab Sample ID*	Description / *Lab Notes*	Asbestos	Fibrous Components	Non-Fibrous Components	Attributes / Treatment
S0001A	Wall,Drywall And Joint Compound,Loc:6,North Boiler Room	**3% Chrysotile**	**3% Cellulose**	**94% Calcium**	White, Tan Fibrous Homogeneous
10024818_0001					Dissolved
S0001B	Wall,Drywall And Joint Compound,Loc:6,North Boiler Room	**3% Chrysotile**	**3% Cellulose**	**94% Calcium**	White, Tan Fibrous Homogeneous
10024818_0002					Dissolved
S0001C	Wall,Drywall And Joint Compound,Loc:6,North Boiler Room	**3% Chrysotile**	**3% Cellulose**	**94% Calcium**	White, Tan Fibrous Homogeneous
10024818_0003					Dissolved
S0002A	Firestopping (mastic),Purple,Loc:6,North Boiler Room	**None Detected**		**100% Other**	Purple Non-Fibrous Homogeneous
10024818_0004					Ashed
S0002B	Firestopping (mastic),Purple,Loc:6,North Boiler Room	**None Detected**		**100% Other**	Purple Non-Fibrous Homogeneous
10024818_0005					Ashed
S0002C	Firestopping (mastic),Purple,Loc:6,North Boiler Room	**None Detected**		**100% Other**	Purple Non-Fibrous Homogeneous
10024818_0006					Ashed
S0003A	Wall,Paint,Concrete Block,Loc:6,North Boiler Room	**None Detected**	**2% Cellulose**	**98% Other**	Gray Fibrous Homogeneous
10024818_0007					Dissolved
S0003B	Wall,Paint,Concrete Block,Loc:6,North Boiler Room	**None Detected**	**2% Cellulose**	**98% Other**	Gray Fibrous Homogeneous
10024818_0008					Dissolved

Disclaimer: Due to the nature of the EPA 600 method, asbestos may not be detected in samples containing low levels of asbestos. We strongly recommend that analysis of floor tiles, vermiculite, and/or heterogenous soil samples be conducted by TEM for confirmation of "None Detected" by PLM. This report relates only to the samples tested and may not be reproduced, except in full, without the written approval of SAI. This report may not be used by the client to claim product endorsement by NVLAP or any other agency of the U.S. government. Analytical uncertainty available upon request. Scientific Analytical Institute participates in the NVLAP Proficiency Testing program. Unless otherwise noted blank sample correction was not performed. Estimated MDL is 0.1%.

Nicholas Pallares (42)
Analyst

Approved Signatory

Bulk Asbestos Analysis

By Polarized Light Microscopy
EPA Method: 600/R-93/116 and
40 CFR, Part 763, Subpart E, App.E

NVLAP LAB CODE 200664-0

Customer: Pinchin Ltd.
6-875 Main St West, Suite 200
Hamilton, ON L8S 4R9

Attn: Justin Appleby
Leslie Heywood

Project: Halton Building 30 Rotary Gardens

Lab Order ID: **10024818**
Analysis: PLM
Date Received: 06/05/2023
Date Reported: 06/13/2023
Date Amended: 06/13/2023

Sample ID / *Lab Sample ID*	Description / *Lab Notes*	Asbestos	Fibrous Components	Non-Fibrous Components	Attributes / Treatment
S0003C	Wall,Paint,Concrete Block,Loc:6,North Boiler Room	**None Detected**	**2% Cellulose**	**98% Other**	Gray Fibrous Homogeneous
10024818_0009					Dissolved
S0004A - A	Floor,Vinyl Floor Tile And Mastic,12x12 Beige With White Fleck,Loc:6,North Boiler Room	**None Detected**	**2% Cellulose**	**98% Other**	Beige Fibrous Homogeneous
10024818_0010	*vinyl floor tile*				Ashed
S0004A - B	Floor,Vinyl Floor Tile And Mastic,12x12 Beige With White Fleck,Loc:6,North Boiler Room	**None Detected**	**2% Cellulose**	**98% Other**	White, Beige Fibrous Homogeneous
10024818_0034	*mastic/leveling compound*				Ashed
S0004B - A	Floor,Vinyl Floor Tile And Mastic,12x12 Beige With White Fleck,Loc:6,North Boiler Room	**None Detected**	**2% Cellulose**	**98% Other**	Beige Fibrous Homogeneous
10024818_0011	*vinyl floor tile*				Ashed
S0004B - B	Floor,Vinyl Floor Tile And Mastic,12x12 Beige With White Fleck,Loc:6,North Boiler Room	**None Detected**	**2% Cellulose**	**98% Other**	White, Beige Fibrous Homogeneous
10024818_0035	*mastic/leveling compound*				Ashed
S0004C - A	Floor,Vinyl Floor Tile And Mastic,12x12 Beige With White Fleck,Loc:6,North Boiler Room	**None Detected**	**2% Cellulose**	**98% Other**	Beige Fibrous Homogeneous
10024818_0012	*vinyl floor tile - ashed*				Ashed
S0004C - B	Floor,Vinyl Floor Tile And Mastic,12x12 Beige With White Fleck,Loc:6,North Boiler Room	**None Detected**	**2% Cellulose**	**98% Other**	Beige, White Fibrous Homogeneous
10024818_0036	*mastic/leveling compound*				Ashed
S0005A	Wall,Drywall And Joint Compound,Yellow,Loc:5,South Boiler Room	**2% Chrysotile**	**3% Cellulose**	**95% Calcium**	Tan Fibrous Homogeneous
10024818_0037					Dissolved

Disclaimer: Due to the nature of the EPA 600 method, asbestos may not be detected in samples containing low levels of asbestos. We strongly recommend that analysis of floor tiles, vermiculite, and/or heterogenous soil samples be conducted by TEM for confirmation of "None Detected" by PLM. This report relates only to the samples tested and may not be reproduced, except in full, without the written approval of SAI. This report may not be used by the client to claim product endorsement by NVLAP or any other agency of the U.S. government. Analytical uncertainty available upon request. Scientific Analytical Institute participates in the NVLAP Proficiency Testing program. Unless otherwise noted blank sample correction was not performed. Estimated MDL is 0.1%.

Nicholas Pallares (42)
Analyst

Approved Signatory

Bulk Asbestos Analysis

By Polarized Light Microscopy
EPA Method: 600/R-93/116 and
40 CFR, Part 763, Subpart E, App.E

NVLAP LAB CODE 200664-0

Lab ID # 173190

Customer: Pinchin Ltd.
6-875 Main St West, Suite 200
Hamilton, ON L8S 4R9

Attn: Justin Appleby
Leslie Heywood

Project: Halton Building 30 Rotary Gardens

Lab Order ID: **10024818**
Analysis: PLM
Date Received: 06/05/2023
Date Reported: 06/13/2023
Date Amended: 06/13/2023

Sample ID / *Lab Sample ID*	Description / *Lab Notes*	Asbestos	Fibrous Components	Non-Fibrous Components	Attributes / Treatment
S0005B	Wall,Drywall And Joint Compound,Yellow,Loc:5,South Boiler Room	**2% Chrysotile**	**3% Cellulose**	**95% Calcium**	Tan Fibrous Homogeneous
10024818_0038					Dissolved
S0005C	Wall,Drywall And Joint Compound,Yellow,Loc:5,South Boiler Room	**2% Chrysotile**	**3% Cellulose**	**95% Calcium**	Tan Fibrous Homogeneous
10024818_0039					Dissolved
S0006A	Wall,Drywall And Joint Compound,Loc:5,South Boiler Room	**2% Chrysotile**	**3% Cellulose**	**95% Calcium**	Tan Fibrous Homogeneous
10024818_0013					Dissolved
S0006B	Wall,Drywall And Joint Compound,Loc:5,South Boiler Room	**2% Chrysotile**	**3% Cellulose**	**95% Calcium**	Tan Fibrous Homogeneous
10024818_0014					Dissolved
S0006C	Wall,Drywall And Joint Compound,Loc:5,South Boiler Room	**2% Chrysotile**	**3% Cellulose**	**95% Calcium**	Tan Fibrous Homogeneous
10024818_0015					Dissolved
S0007A	Wall,Paint,Concrete Block,Loc:5,South Boiler Room	**None Detected**	**2% Cellulose**	**98% Other**	Gray Fibrous Homogeneous
10024818_0016					Dissolved
S0007B	Wall,Paint,Concrete Block,Loc:5,South Boiler Room	**None Detected**	**2% Cellulose**	**98% Other**	Gray Fibrous Homogeneous
10024818_0017					Dissolved
S0007C	Wall,Paint,Concrete Block,Loc:5,South Boiler Room	**None Detected**	**2% Cellulose**	**98% Other**	Gray Fibrous Homogeneous
10024818_0018					Dissolved

Disclaimer: Due to the nature of the EPA 600 method, asbestos may not be detected in samples containing low levels of asbestos. We strongly recommend that analysis of floor tiles, vermiculite, and/or heterogenous soil samples be conducted by TEM for confirmation of "None Detected" by PLM. This report relates only to the samples tested and may not be reproduced, except in full, without the written approval of SAI. This report may not be used by the client to claim product endorsement by NVLAP or any other agency of the U.S. government. Analytical uncertainty available upon request. Scientific Analytical Institute participates in the NVLAP Proficiency Testing program. Unless otherwise noted blank sample correction was not performed. Estimated MDL is 0.1%.

Nicholas Pallares (42)
Analyst

Approved Signatory

Bulk Asbestos Analysis

By Polarized Light Microscopy
EPA Method: 600/R-93/116 and
40 CFR, Part 763, Subpart E, App.E

NVLAP LAB CODE 200664-0

Lab ID # 173190

Customer: Pinchin Ltd.
6-875 Main St West, Suite 200
Hamilton, ON L8S 4R9

Attn: Justin Appleby
Leslie Heywood

Project: Halton Building 30 Rotary Gardens

Lab Order ID: **10024818**
Analysis: PLM
Date Received: 06/05/2023
Date Reported: 06/13/2023
Date Amended: 06/13/2023

Sample ID / *Lab Sample ID*	Description / *Lab Notes*	Asbestos	Fibrous Components	Non-Fibrous Components	Attributes / Treatment
S0008A - A	Floor,Vinyl Floor Tile And Mastic,9x9 White With Brown Streaks,Loc:5,South Boiler Room	**2% Chrysotile**	**3% Cellulose**	**95% Other**	White, Brown Fibrous Homogeneous
10024818_0019	*vinyl floor tile*				Ashed
S0008A - B	Floor,Vinyl Floor Tile And Mastic,9x9 White With Brown Streaks,Loc:5,South Boiler Room	**5% Chrysotile**	**3% Cellulose**	**92% Other**	Black Fibrous Homogeneous
10024818_0040	*mastic*				Ashed
S0008B - A	Floor,Vinyl Floor Tile And Mastic,9x9 White With Brown Streaks,Loc:5,South Boiler Room	**2% Chrysotile**	**3% Cellulose**	**95% Other**	White, Brown Fibrous Homogeneous
10024818_0020	*vinyl floor tile*				Ashed
S0008B - B	Floor,Vinyl Floor Tile And Mastic,9x9 White With Brown Streaks,Loc:5,South Boiler Room	**5% Chrysotile**	**3% Cellulose**	**92% Other**	Black Fibrous Homogeneous
10024818_0041	*mastic*				Ashed
S0008C - A	Floor,Vinyl Floor Tile And Mastic,9x9 White With Brown Streaks,Loc:5,South Boiler Room	**2% Chrysotile**	**3% Cellulose**	**95% Other**	Brown, White Fibrous Homogeneous
10024818_0021	*vinyl floor tile*				Ashed
S0008C - B	Floor,Vinyl Floor Tile And Mastic,9x9 White With Brown Streaks,Loc:5,South Boiler Room	**5% Chrysotile**	**3% Cellulose**	**92% Other**	Black Fibrous Homogeneous
10024818_0042	*mastic*				Ashed
S0009A	Cement Product,Firestopping,Loc:5,South Boiler Room	**None Detected**	**2% Cellulose**	**98% Other**	Gray Fibrous Homogeneous
10024818_0022					Dissolved
S0009B	Cement Product,Firestopping,Loc:5,South Boiler Room	**None Detected**	**2% Cellulose**	**98% Other**	Gray Fibrous Homogeneous
10024818_0023					Dissolved

Disclaimer: Due to the nature of the EPA 600 method, asbestos may not be detected in samples containing low levels of asbestos. We strongly recommend that analysis of floor tiles, vermiculite, and/or heterogenous soil samples be conducted by TEM for confirmation of "None Detected" by PLM. This report relates only to the samples tested and may not be reproduced, except in full, without the written approval of SAI. This report may not be used by the client to claim product endorsement by NVLAP or any other agency of the U.S. government. Analytical uncertainty available upon request. Scientific Analytical Institute participates in the NVLAP Proficiency Testing program. Unless otherwise noted blank sample correction was not performed. Estimated MDL is 0.1%.

Nicholas Pallares (42)
Analyst

Approved Signatory

Bulk Asbestos Analysis

By Polarized Light Microscopy
EPA Method: 600/R-93/116 and
40 CFR, Part 763, Subpart E, App.E

NVLAP LAB CODE 200664-0

Lab ID # 173190

Customer: Pinchin Ltd.
6-875 Main St West, Suite 200
Hamilton, ON L8S 4R9

Attn: Justin Appleby
Leslie Heywood

Project: Halton Building 30 Rotary Gardens

Lab Order ID: **10024818**
Analysis: PLM
Date Received: 06/05/2023
Date Reported: 06/13/2023
Date Amended: 06/13/2023

Sample ID / *Lab Sample ID*	Description / *Lab Notes*	Asbestos	Fibrous Components	Non-Fibrous Components	Attributes / Treatment
S0009C	Cement Product,Firestopping,Loc:5,South Boiler Room	**None Detected**	**2% Cellulose**	**98% Other**	Gray Fibrous Homogeneous
10024818_0024					Dissolved
S0010A	Wall,Drywall And Joint Compound,Loc:1,Unit 258	**2% Chrysotile**	**3% Cellulose**	**95% Calcium**	Tan Fibrous Homogeneous
10024818_0025					Dissolved
S0010B	Wall,Drywall And Joint Compound,Loc:1,Unit 258	**2% Chrysotile**	**3% Cellulose**	**95% Calcium**	Tan Fibrous Homogeneous
10024818_0026					Dissolved
S0010C	Wall,Drywall And Joint Compound,Loc:1,Unit 258	**2% Chrysotile**	**3% Cellulose**	**95% Calcium**	Tan Fibrous Homogeneous
10024818_0027					Dissolved
S0011A	Wall,Drywall And Joint Compound,Loc:3,Unit 1293	**2% Chrysotile**	**3% Cellulose**	**95% Calcium**	Tan Fibrous Homogeneous
10024818_0028					Dissolved
S0011B	Wall,Drywall And Joint Compound,Loc:3,Unit 1293	**2% Chrysotile**	**3% Cellulose**	**95% Calcium**	Tan Fibrous Homogeneous
10024818_0029					Dissolved
S0011C	Wall,Drywall And Joint Compound,Loc:3,Unit 1293	**2% Chrysotile**	**3% Cellulose**	**95% Calcium**	Tan Fibrous Homogeneous
10024818_0030					Dissolved
S0012A	Wall,Drywall And Joint Compound,Loc:4,Unit 1297	**2% Chrysotile**	**3% Cellulose**	**95% Calcium**	Tan Fibrous Homogeneous
10024818_0031					Dissolved

Disclaimer: Due to the nature of the EPA 600 method, asbestos may not be detected in samples containing low levels of asbestos. We strongly recommend that analysis of floor tiles, vermiculite, and/or heterogenous soil samples be conducted by TEM for confirmation of "None Detected" by PLM. This report relates only to the samples tested and may not be reproduced, except in full, without the written approval of SAI. This report may not be used by the client to claim product endorsement by NVLAP or any other agency of the U.S. government. Analytical uncertainty available upon request. Scientific Analytical Institute participates in the NVLAP Proficiency Testing program. Unless otherwise noted blank sample correction was not performed. Estimated MDL is 0.1%.

Nicholas Pallares (42)
Analyst

Approved Signatory

Bulk Asbestos Analysis

By Polarized Light Microscopy
EPA Method: 600/R-93/116 and
40 CFR, Part 763, Subpart E, App.E

NVLAP LAB CODE 200664-0

Lab ID # 173190

Customer: Pinchin Ltd.
6-875 Main St West, Suite 200
Hamilton, ON L8S 4R9

Attn: Justin Appleby
Leslie Heywood

Project: Halton Building 30 Rotary Gardens

Lab Order ID: **10024818**
Analysis: PLM
Date Received: 06/05/2023
Date Reported: 06/13/2023
Date Amended: 06/13/2023

Sample ID *Lab Sample ID*	Description *Lab Notes*	Asbestos	Fibrous Components	Non-Fibrous Components	Attributes Treatment
S0012B	Wall,Drywall And Joint Compound,Loc:4,Unit 1297	**2% Chrysotile**	**3% Cellulose**	**95% Calcium**	Tan Fibrous Homogeneous
10024818_0032					Dissolved
S0012C	Wall,Drywall And Joint Compound,Loc:4,Unit 1297	**2% Chrysotile**	**3% Cellulose**	**95% Calcium**	Tan Fibrous Homogeneous
10024818_0033					Dissolved

Disclaimer: Due to the nature of the EPA 600 method, asbestos may not be detected in samples containing low levels of asbestos. We strongly recommend that analysis of floor tiles, vermiculite, and/or heterogenous soil samples be conducted by TEM for confirmation of "None Detected" by PLM. This report relates only to the samples tested and may not be reproduced, except in full, without the written approval of SAI. This report may not be used by the client to claim product endorsement by NVLAP or any other agency of the U.S. government. Analytical uncertainty available upon request. Scientific Analytical Institute participates in the NVLAP Proficiency Testing program. Unless otherwise noted blank sample correction was not performed. Estimated MDL is 0.1%.

Nicholas Pallares (42)
Analyst

Approved Signatory

1002481B
Revised

Version 1-15-2012

Client:	Pinchin Ltd.
Contact:	Justin Appleby / Leslie Heywood
Address:	ON
Phone:	
Fax:	
Email:	jappleby@pinchin.com lheywood@pinchin.com
Project:	Halton Building 30 No Stop Positives. Perform ashing on third vinyl floor tile if first two are ND.
Client Notes:	
P.O. #.	320580.001
Date Submitted:	06-13-2023
Analysis:	PLM BULK EPA 600
TurnAroundTime:	6+ days

Instructions:
Use Column "B" for your contact info

To See an Example Click the bottom Example Tab

39
Begin Samples with a "<<" above the first sample

and end with a ">>" below the last sample.
Only Enter your data on the first sheet "Sheet1"

Note: Data 1 and Data 2 are optional fields that do not show up on the official report, however they will be included in the electronic data returned to you to facilitate your reintegration of the report data

Scientific Analytical Institute

4604 Dundas Dr.
Greensboro, NC 27407
Phone: 336.292.3888
Fax: 336.292.3313
Email: lab@sailab.com

<<	
S0001A	Wall,Drywall And Joint Compound,Loc:6,North Boiler Room
S0001B	Wall,Drywall And Joint Compound,Loc:6,North Boiler Room
S0001C	Wall,Drywall And Joint Compound,Loc:6,North Boiler Room
S0002A	Firestopping (mastic),Purple,Loc:6,North Boiler Room
S0002B	Firestopping (mastic),Purple,Loc:6,North Boiler Room
S0002C	Firestopping (mastic),Purple,Loc:6,North Boiler Room
S0003A	Wall,Paint,Concrete Block,Loc:6,North Boiler Room
S0003B	Wall,Paint,Concrete Block,Loc:6,North Boiler Room
S0003C	Wall,Paint,Concrete Block,Loc:6,North Boiler Room
S0004A	Floor,Vinyl Floor Tile And Mastic,12x12 Beige With White Fleck,Loc:6,North Boiler Room
S0004B	Floor,Vinyl Floor Tile And Mastic,12x12 Beige With White Fleck,Loc:6,North Boiler Room
S0004C	Floor,Vinyl Floor Tile And Mastic,12x12 Beige With White Fleck,Loc:6,North Boiler Room
S0005A	**Wall,Drywall And Joint Compound,Yellow,Loc:5,South Boiler Room**
S0005B	**Wall,Drywall And Joint Compound,Yellow,Loc:5,South Boiler Room**
S0005C	**Wall,Drywall And Joint Compound,Yellow,Loc:5,South Boiler Room**
S0006A	Wall,Drywall And Joint Compound,Loc:5,South Boiler Room
S0006B	Wall,Drywall And Joint Compound,Loc:5,South Boiler Room
S0006C	Wall,Drywall And Joint Compound,Loc:5,South Boiler Room
S0007A	Wall,Paint,Concrete Block,Loc:5,South Boiler Room
S0007B	Wall,Paint,Concrete Block,Loc:5,South Boiler Room
S0007C	Wall,Paint,Concrete Block,Loc:5,South Boiler Room
S0008A	Floor,Vinyl Floor Tile And Mastic,9x9 White With Brown Streaks,Loc:5,South Boiler Room
S0008B	Floor,Vinyl Floor Tile And Mastic,9x9 White With Brown Streaks,Loc:5,South Boiler Room
S0008C	Floor,Vinyl Floor Tile And Mastic,9x9 White With Brown Streaks,Loc:5,South Boiler Room
S0009A	Firestopping (friable),Loc:5,South Boiler Room
S0009B	Firestopping (friable),Loc:5,South Boiler Room
S0009C	Firestopping (friable),Loc:5,South Boiler Room
S0010A	Wall,Drywall And Joint Compound,Loc:1,Unit 258
S0010B	Wall,Drywall And Joint Compound,Loc:1,Unit 258
S0010C	Wall,Drywall And Joint Compound,Loc:1,Unit 258
S0011A	Wall,Drywall And Joint Compound,Loc:2,Unit 266
S0011B	Wall,Drywall And Joint Compound,Loc:2,Unit 266
S0011C	Wall,Drywall And Joint Compound,Loc:2,Unit 266
S0012A	Wall,Drywall And Joint Compound,Loc:3,Unit 1293
S0012B	Wall,Drywall And Joint Compound,Loc:3,Unit 1293
S0012C	Wall,Drywall And Joint Compound,Loc:3,Unit 1293
S0013A	Wall,Drywall And Joint Compound,Loc:4,Unit 1297
S0013B	Wall,Drywall And Joint Compound,Loc:4,Unit 1297
S0013C	Wall,Drywall And Joint Compound,Loc:4,Unit 1297
>>	

6/13

Accepted ☒

Rejected ☐

APPENDIX III
Methodology

1.0 GENERAL

An inspection was conducted to identify the asbestos-containing materials (ACM) incorporated in the structure and its finishes as defined by the scope of work.

Information regarding the location and condition of ACM encountered and visually estimated quantities were recorded. The locations of any samples collected were recorded on small-scale plans. As-built drawings and previous reports were referenced where provided.

Sample collection was conducted in accordance with our Standard Operating Procedures.

The inspection for asbestos included friable and non-friable asbestos-containing materials (ACM). A friable material is a material that when dry can be crumbled, pulverized or powdered by hand pressure.

A separate set of samples was collected of each type of homogenous material suspected to contain asbestos. A homogenous material is defined by the US EPA as material that is uniform in texture and appearance, was installed at one time, and is unlikely to consist of more than one type or formulation of material. The homogeneous materials were determined by visual examination and available information on the phases of construction and prior renovations.

Samples were collected at a rate that is in compliance with the requirements of local regulations and guidelines. In some cases, manufactured products such as asbestos cement pipe were visually identified without sample confirmation.

The analysis was performed in accordance with Test Method EPA/600/R-93/116: Method for the Determination of Asbestos in Bulk Building Materials, July 1993.

Analytical results were compared to the following criteria.

Jurisdiction*	Friable	Non-Friable
Ontario	0.5%	0.5%

Where building materials are described in the report as “non-asbestos” or “does not contain asbestos”, this means that either no asbestos was detected by the analytical method utilized in any of the multiple samples or, if detected, it is below the lower limit of an asbestos-containing material in the applicable regulation. Additionally, these terms are used for materials which historically are known to not include asbestos in their manufacturing.

Asbestos materials were evaluated in order to make recommendations regarding remedial work. The priority for remedial action was based on several factors:

- Friability (friable or non-friable);

© 2023 Pinchin Ltd.

- Condition (good, fair, poor, debris);
- Accessibility (ranking from accessible to all building users to inaccessible);
- Visibility (whether the material is obscured by other building components).
- Efficiency of the work (for example, if damaged ACM is being removed in an area, it may be most practical to remove all ACM in the area even if it is in good condition).

For a complete description of the Evaluation Criteria and Basis of Recommendations, refer to Annex A.

Template: Methodology for Asbestos Assessment, HAZ, July 22, 2021

© 2023 Pinchin Ltd.

METHODOLOGY ANNEX A EVALUATION CRITERIA

1.0 EVALUATION CRITERIA AND BASIS OF RECOMMENDATIONS

The detailed asbestos assessment provides information regarding the location, condition, accessibility and friability of the asbestos-containing materials (ACM). In order to make recommendations for compliance with current regulations, Pinchin developed the following criteria.

2.0 EVALUATION OF CONDITION

2.1 Friable Sprayed or Trowelled Fireproofing, Thermal Insulation and Texture Finishes (Surfacing Materials)

To evaluate the condition of ACM sprayed or trowelled on fireproofing, sprayed or trowelled thermal insulation (non-mechanical), or texture, decorative or acoustic finishes, the following criteria are applied:

Good	Surface of material shows no significant signs of damage, deterioration or delamination. Good condition includes unencapsulated or unpainted fireproofing or texture finishes, where no or limited delamination or damage is observed, or encapsulated fireproofing or texture finishes where the encapsulant or paint has been applied after the damage or fallout occurred.
Poor	A sprayed material that shows signs of significant damage or is significantly delaminating or deteriorating. This may be limited to surface delamination or some portion of the substrate may be exposed.

In Locations where damage exists in isolated areas, both good and poor condition may be applicable. The extent of each condition will be recorded. Fair condition is not utilized in the evaluation of ACM sprayed or trowelled fireproofing, sprayed or trowelled thermal insulation (non-mechanical), or texture, decorative or acoustic finishes.

The evaluation of the above products above ceilings may be limited by the number of observations and by building components such as ducts or full height walls that obstruct the above ceiling observations.

2.2 Friable Mechanical or Thermal System Insulation (TSI)

To evaluate the condition of mechanical insulation on vessels, boilers, breeching, ducts, pipes, fan units, equipment etc. the following criteria are applied:

Good	Insulation is completely covered in jacketing and exhibits no evidence of damage or deterioration. No insulation is exposed. Includes conditions where the jacketing has minor damage (i.e. scuffs or stains), but the jacketing is not penetrated.
Fair	Minor penetrating damage to jacketed insulation (cuts, tears, nicks, deterioration or delamination) or undamaged insulation that has never been jacketed. Insulation is exposed but not showing surface disintegration. The extent of missing insulation ranges from minor to none. Damage can be repaired.

© 2023 Pinchin Ltd.

Poor	Original insulation jacket is missing, damaged, deteriorated or delaminated. Insulation is exposed and significant areas have been dislodged. Damage cannot be readily repaired. Includes components where insulation may have been removed incompletely.

The evaluation of mechanical insulation may be limited by the number of observations made and building components such as ducts or full height walls that obstruct observations. It is often not possible to observe each foot of mechanical insulation from all angles.

2.3 Potentially Friable Materials and Miscellaneous Friable Materials

Potentially friable ACM are products that are basically non-friable while in place but have the potential to generate friable dust upon removal or if significantly disturbed without appropriate procedures. These products may become friable if damaged. Potentially friable materials include materials such as acoustic ceiling tiles and plaster. To evaluate the condition of potentially friable materials, the following criteria are applied:

Good	No significant damage or deterioration. Still serving its intended use as a building material or finish.
Fair	Showing signs of some cracking or breakage, but is not deteriorating (e.g. cracked plaster, broken but in place ceiling tile, missing tile or section of plaster etc.). The condition is such that it is still serving its intended use as a building material or finish but may require repair for mainly cosmetic purposes.
Poor	Significant deterioration or breaking apart of the material. Material has deteriorated to the point it is not serving its intended use as building material or finish. Material has deteriorated to a point it has become friable. Normally potentially friable ACM in Poor condition is not repairable and requires at least localized removal and replacement.

2.4 Non-Friable Materials

Non-friable ACM cover a wide range of products with a wide variation in their tendency to release dust or asbestos fibres to the air. Many of these materials, (particularly where the matrix is an unweathered bitumen, asphalt or tar material) do not release fibres except in very unusual circumstances or during significant disturbance (e.g. use of abrasive power tools). Others with a cementitious matrix (asbestos-cement products) can more readily release dust due to abrasion, demolition, weathering, etc. The potential for asbestos release from non-friable ACM is always lower than from friable ACM. To evaluate the condition of non-friable Materials, the following criteria are applied:

Good	No significant damage or deterioration. Still serving its intended use as a building material or finish.

© 2023 Pinchin Ltd.

Fair	Showing signs of some cracking or breakage but is not deteriorating (e.g. cracked vinyl floor tile, missing piece of tile or transite, etc.). The condition is such that it is still serving its intended use as a building material or finish but may require repair for mainly cosmetic purposes.
Poor	Significant deterioration or breaking apart of the material to the point at which it cannot be repaired, and it will require at least local removal. Material has deteriorated to the point it is not serving its intended use as building material or finish. Material may have deteriorated to a point where traffic or disturbance may cause it to become friable.

2.5 Evaluation of ACM Debris

The identification of the exact location or presence of debris on the top of ceiling tiles is limited by the number of observations made and the presence of building components such as ducts or full height walls that obstruct observations.

The presence of fallen or dislodged ACM is noted separately from the ACM source and is referred to as Debris. Debris may be friable if from a friable ACM source or a badly deteriorated non-friable ACM source. Debris may also be non-friable (such as fallen pieces of transite sheet or mastic fittings, or broken, dislodged floor tiles).

Debris	Debris may be friable or non-friable but is always identified as debris.

2.6 Evaluation of Presumed Asbestos-Containing Material (PACM)

Presumed asbestos-containing materials (PACM), are building materials that may contain asbestos but were not sampled or analyzed due to inaccessibility or the need to perform destructive testing to obtain a reasonable sample set. Evaluation of these materials is based on the assumption that these PACM are asbestos-containing.

A list of PACM is provided in the report and they are generally not included in the detailed room by room reports. Typically, they are excluded because they are inaccessible or present in very small quantities. If PACM are evaluated, Pinchin uses the criteria that correspond with the type (and friability) of the material listed above.

© 2023 Pinchin Ltd.

3.0 EVALUATION OF ACCESSIBILITY

The accessibility of building materials known or suspected of being ACM is rated according to the following criteria:

Access (A)	Common areas of the building within reach of all building users (approximately 8 ’-9’ from floor or standard ceiling height). Includes other areas where occupant activities may result in disturbance of material that is not normally within reach from floor level, but may be disturbed by common activities (e.g. gymnasiums, workshops, warehouses)
Access (B)	Areas of the building accessed primarily by Maintenance/Caretaking/Janitorial Staff and within reach without use of a ladder. Includes areas within reach in Boiler Rooms, Electrical Rooms, Janitors Closets, Elevator Rooms, Mechanical Rooms, etc. Includes materials within reach from fixed ladders or catwalks, mezzanines, and accessible pipe chases.
Access (C) and Visible	Areas of the building above 8' - 9’ where use of a ladder or scaffold is required to reach the ACM. Only includes ACM that are visible to view without the removal or opening of other building components such as ceiling tiles or service access panels. Visible column on HMIS sheets will say YES.
Access (C) and not Visible	Areas of the building above 8' - 9’ where use of a ladder or scaffold is required to reach the ACM. Includes ACM that are not visible to view and require the removal of a building component to see, such as ceilings tiles or access panels to view and access. Includes rarely entered crawl spaces, attic spaces, etc. Observations will be limited to the extent visible from the access points. Visible column on HMIS sheets will say NO.
Access (D)	Areas of the building behind inaccessible solid ceiling systems, walls or equipment etc. where demolition of the ceiling, wall or equipment etc. is required to reach the ACM. Material inaccessible due to height or location or is only accessed under unusual situations. Evaluation of condition and extent of ACM is limited or impossible, depending on the surveyor's ability to visually examine materials in Access D.

4.0 ACTION MATRIX AND DEFINITIONS

Pinchin’s evaluation of the viability of a specific asbestos control option is based on the consideration of the friability, condition, accessibility and visibility of a material. The logic used is that damaged ACM located in an area frequently accessed by all building occupants is of a higher priority than damaged ACM located in an infrequently accessed service area. The action matrix considers the potential for fibre release (primarily from friable ACM) and the possible concerns from regulatory bodies and many building occupants to all damaged ACM (including non-friable).

In any building with asbestos, many current regulations require an Asbestos Management Program be implemented. Depending on the condition and the accessibility, more active measures such as repair or removal may be recommended. The following matrix provides guidance for recommended Actions in the absence of renovation or demolition. In the event of construction or maintenance activity which will disturb ACM more aggressive control or removal will be required.

© 2023 Pinchin Ltd.

4.1 Action Matrix

The following tables outline the action decisions based on the relationship of assessed factors. Table I applies to friable ACM. Table II applies to non-friable ACM.

Table I Decision Matrix for Friable ACM

Access	Condition			Debris
	Good	Fair	Poor	
(A)	Action 5[1]	Action 5[2]	Action 3	Action 1
(B)	Action 7	Action 6[3]	Action 3	Action 1
(C) Visible	Action 7	Action 6	Action 3	Action 2
(C) Not Visible	Action 7	Action 7	Action 4	Action 2
(D)	Action 7	Action 7	Action 7	Action 7

Table II Decision Matrix for Potentially Friable and Non-Friable ACM

Access	Condition			Debris
	Good	Fair	Poor	
(A)	Action 7	Action 7[4]	Action 3	Action 1
(B)	Action 7	Action 7	Action 3	Action 1
(C) Visible	Action 7	Action 7	Action 4	Action 2
(C) Not Visible	Action 7	Action 7	Action 4	Action 2
(D)	Action 7	Action 7	Action 7	Action 7

4.2 Action Definitions

The following are the definitions in the Action Matrix Table presented above:

Action Definitions	
Action 1	Clean-Up of ACM Debris Restrict access that is likely to cause a disturbance of the ACM Debris and clean up ACM Debris. Utilize appropriate asbestos precautions.

[1] If friable ACM in access (A)/Good condition is not proactively removed Action 7 (Manage) is recommended.
[2] If friable ACM in access (A)/Fair condition is not proactively removed repair is recommended.
[3] If friable ACM in access (B)/Fair condition is likely to be disturbed after repair proactive removal is recommended.
[4] Action 7 is recommended for all non-friable ACM in Fair condition however some clients may wish to repair or take some action primarily for cosmetic reasons

© 2023 Pinchin Ltd.

Action Definitions	
Action 2	Precautions for Access Which may Disturb ACM Debris Use appropriate means to isolate the debris or to limit entry to the area which may disturb the material. At locations where ACM Debris can remain in place in lieu of removal or clean-up (e.g. Debris on top of ceiling tiles or behind lockable door), Utilize appropriate asbestos precautions to enter the area if this will disturb debris. The precautions will be required until the ACM Debris has been cleaned up.
Action 3	ACM Removal Remove ACM. Utilize asbestos procedures appropriate to the scope of the removal work. Until it is removed, restrict access to the material so it is not disturbed.
Action 4	Precautions for Work Which may Disturb ACM in Poor Condition. Utilize appropriate asbestos precautions if ACM may be disturbed by work on or near ACM. This does not require restricting access to the area, only control of work which may contact or disturb the ACM. Removal is the only viable option if work will disturb ACM.
Action 5	Proactive ACM Removal Remove friable ACM where the presence of friable asbestos in Good condition is not desirable. If friable ACM in Fair condition is not removed, then Repair friable ACM.
Action 6	ACM Repair Repair friable ACM in Fair condition which is not likely to be damaged again or disturbed by normal use of the area or room. Pinchin recommends proactive removal if friable ACM is likely to be damaged or disturbed during normal use of the area or room
Action 7	Asbestos Management Program with Routine Surveillance Implement an Asbestos Management Program, including routine surveillance of ACM. Reassess materials regularly (typically once per year).

Master Template: Methodology Annex A to Appendix I Evaluation Criteria, HAZ, January 10, 2020

© 2023 Pinchin Ltd.

APPENDIX IV

Location Summary Report

HMIS
HAZARDOUS MATERIALS INVENTORY SYSTEM

LOCATIONS LIST

PINCHIN
1.855.PINCHIN www.pinchin.com

Client:Halton Region

Site: 1285-1299 Sedgewick Crescent and 234-274 Woodside, Oakville, ON

Building Name: Rotary Gardens
Survey Date:
Building Phases: A: 1956

Last Re-Assessment:

Location No.	Name or Description	Area ft²	Floor No.	Bldg. Phase	Notes
1	Unit 258	0	1	A	
2	Unit 266	0	1	A	
3	Unit 1293	0	1	A	
4	Unit 1297	0	1	A	
5	South Boiler Room	0	1	A	
6	North Boiler Room	0	1	A	

Copyright Pinchin Ltd. 2023

APPENDIX V

Asbestos Material Summary Report / Sample Log

HMIS
HAZARDOUS MATERIALS INVENTORY SYSTEM

HAZARDOUS MATERIALS SUMMARY / SAMPLE LOG

PINCHIN
1.855.PINCHIN www.pinchin.com

Client:Halton Region **Site: 1285-1299 Sedgewick Crescent and 234-274 Woodside, Oakville, ON** **Building Name: Rotary Gardens** **Survey Date:**

HAZMAT	Sample No	System/Component/Material/Sample Description	Locations	Bldg. Phase	LF	SF	EA	%	Type	Positive	Friability
Asbestos	S0001 ABC	Wall, Ceiling | | Drywall And Joint Compound |	6	A	0	1400	0	0	Chrysotile	Yes	NF
Asbestos	S0002 ABC	Other | | Firestopping (mastic) | Purple	6	A	0	2	0	0	None Detected	No	
Asbestos	S0003 ABC	Wall | | Paint | Concrete Block	6	A	0	800	0	0	None Detected	No	
Asbestos	S0004 ABC	Floor | | Vinyl Floor Tile And Mastic | 12x12 Beige With White Fleck	5,6	A	0	400	0	0	None Detected	No	
Asbestos	S0005 ABC	Wall | | Drywall And Joint Compound |	5	A	0	200	0	0	Chrysotile	Yes	NF
Asbestos	S0006 ABC	Wall, Ceiling | | Drywall And Joint Compound |	5	A	0	1400	0	0	Chrysotile	Yes	NF
Asbestos	S0007 ABC	Wall | | Paint | Concrete Block	5	A	0	800	0	0	None Detected	No	
Asbestos	S0008 ABC	Floor | | Vinyl Floor Tile And Mastic | 9x9 White With Brown Streaks	5	A	0	20	0	0	Chrysotile	Yes	NF
Asbestos	S0009 ABC	Other | | Firestopping (cementitious) |	5	A	0	10	0	0	None Detected	No	
Asbestos	S0010 ABC	Wall, Ceiling | | Drywall And Joint Compound |	1	A	0	1400	0	0	Chrysotile	Yes	NF
Asbestos	S0011 ABC	Wall, Ceiling | | Drywall And Joint Compound |	2	A	0	1400	0	0	Chrysotile	Yes	NF
Asbestos	S0012 ABC	Wall, Ceiling, Wall | | Drywall And Joint Compound |	3,4	A	0	2800	0	0	Chrysotile	Yes	NF
Asbestos	V9500	Wall | | Mortar | Thin-set	1,2,3,4	A	0	200	0	0	Presumed Asbestos	Yes	NF

Quantities shown above are based on visual approximations only and may be subject to variation. Copyright Pinchin Ltd. 2023

HMIS
HAZARDOUS MATERIALS INVENTORY SYSTEM

HAZARDOUS MATERIALS SUMMARY / SAMPLE LOG

PINCHIN
1.855.PINCHIN www.pinchin.com

Legend:

Sample number	
S####	Asbestos sample collected
L####	Paint sample collected
P####	PCB sample collected
M####	Mould sample collected
V####	Material visually similar to numbered sample collected
V0000	Known non Hazardous Material
V9000	Material is visually identified as Hazardous Material
V9500	Material is presumed to be Hazardous Material
[Loc. No.]	Abated Material

Units	
SF	Square feet
LF	Linear feet
EA	Each
%	Percentage

NF	Non Friable material.
F	Friable material
PF	Potentially Friable material

Quantities shown above are based on visual approximations only and may be subject to variation. Copyright Pinchin Ltd. 2023

APPENDIX VI

HMIS Data Report

HMIS
HAZARDOUS MATERIALS INVENTORY SYSTEM

ALL DATA REPORT

PINCHIN
1.855.PINCHIN www.pinchin.com

Client: Halton Region
Location: #1 : Unit 258
Survey Date: 2023-06-02

Site: Buildings
Floor: 1

Building Name: Rotary Gardens
Room #:
Last Re-Assessment: 0000-00-00

Area (sqft): 0

ASBESTOS																
System	Component	Material	Item	Covering	A*	V*	AP*	Good	Fair	Poor	Unit	Sample	Asbestos Type	Amount	Hazard	Friable
Ceiling		Drywall and joint compound			A	Y		800(7)			SF	V0010	Chrysotile	0.5-5%	Confirmed Asbestos	NF
Duct	Not Accessible															
Floor		Laminate			A	Y										
Mechanical Equipment	Not Accessible															
Piping	Not Accessible															
Structure	Not Accessible															
Wall		Drywall and joint compound			A	Y		600(7)			SF	S0010ABC	Chrysotile	0.5-5%	Confirmed Asbestos	NF
Wall		Ceramic Tiles			A	Y										
Wall		Mortar, Thin-set			D	N		50(7)			SF	V9500	Presumed Asbestos		Presumed Asbestos	NF

Quantities shown above are based on visual approximations only and may be subject to variation. Copyright Pinchin Ltd. 2023

HMIS
HAZARDOUS MATERIALS INVENTORY SYSTEM

ALL DATA REPORT

PINCHIN
1.855.PINCHIN www.pinchin.com

Client: Halton Region
Location: #2 : Unit 266
Survey Date: 2023-06-02

Site: Buildings
Floor: 1

Building Name: Rotary Gardens
Room #:
Last Re-Assessment: 0000-00-00

Area (sqft): 0

ASBESTOS																
System	Component	Material	Item	Covering	A*	V*	AP*	Good	Fair	Poor	Unit	Sample	Asbestos Type	Amount	Hazard	Friable
Ceiling		Drywall and joint compound			A	Y		800(7)			SF	V0011	Chrysotile	0.5-5%	Confirmed Asbestos	NF
Duct	Not Accessible															
Floor		Laminate			A	Y										
Mechanical Equipment	Not Accessible															
Piping	Not Accessible															
Structure	Not Accessible															
Wall		Drywall and joint compound			A	Y		600(7)			SF	S0011ABC	Chrysotile	0.5-5%	Confirmed Asbestos	NF
Wall		Ceramic Tiles			A	Y										
Wall		Mortar, Thin-set			D	N		50(7)			SF	V9500	Presumed Asbestos		Presumed Asbestos	NF

Quantities shown above are based on visual approximations only and may be subject to variation. Copyright Pinchin Ltd. 2023

HMIS
HAZARDOUS MATERIALS INVENTORY SYSTEM

ALL DATA REPORT

PINCHIN
1.855.PINCHIN www.pinchin.com

Client: Halton Region
Location: #3 : Unit 1293
Survey Date: 2023-06-02

Site: Buildings
Floor: 1

Building Name: Rotary Gardens
Room #:
Last Re-Assessment: 0000-00-00

Area (sqft): 0

ASBESTOS																
System	Component	Material	Item	Covering	A*	V*	AP*	Good	Fair	Poor	Unit	Sample	Asbestos Type	Amount	Hazard	Friable
Ceiling		Drywall and joint compound			A	Y		800(7)			SF	V0012	Chrysotile	0.5-5%	Confirmed Asbestos	NF
Duct	Not Accessible															
Floor		Laminate			A	Y										
Mechanical Equipment	Not Accessible															
Piping	Not Accessible															
Structure	Not Accessible															
Wall		Drywall and joint compound			A	Y		600(7)			SF	S0012ABC	Chrysotile	0.5-5%	Confirmed Asbestos	NF
Wall		Ceramic Tiles			A	Y										
Wall		Mortar, Thin-set			D	N		50(7)			SF	V9500	Presumed Asbestos		Presumed Asbestos	NF

Quantities shown above are based on visual approximations only and may be subject to variation. Copyright Pinchin Ltd. 2023

HMIS
HAZARDOUS MATERIALS INVENTORY SYSTEM

ALL DATA REPORT

PINCHIN
1.855.PINCHIN www.pinchin.com

Client: Halton Region
Location: #4 : Unit 1297
Survey Date: 2023-06-02

Site: Buildings
Floor: 1

Building Name: Rotary Gardens
Room #:
Last Re-Assessment: 0000-00-00

Area (sqft): 0

ASBESTOS																
System	Component	Material	Item	Covering	A*	V*	AP*	Good	Fair	Poor	Unit	Sample	Asbestos Type	Amount	Hazard	Friable
Ceiling		Drywall and joint compound			A	Y		800(7)			SF	V0012	Chrysotile	0.5-5%	Confirmed Asbestos	NF
Duct	Not Accessible															
Floor		Laminate			A	Y										
Mechanical Equipment	Not Accessible															
Piping	Not Accessible															
Structure	Not Accessible															
Wall		Drywall and joint compound			A	Y		600(7)			SF	V0012	Chrysotile	0.5-5%	Confirmed Asbestos	NF
Wall		Ceramic Tiles			A	Y										
Wall		Mortar, Thin-set			D	N		50(7)			SF	V9500	Presumed Asbestos		Presumed Asbestos	NF

Quantities shown above are based on visual approximations only and may be subject to variation. Copyright Pinchin Ltd. 2023

HMIS HAZARDOUS MATERIALS INVENTORY SYSTEM

ALL DATA REPORT

PINCHIN 1.855.PINCHIN www.pinchin.com

Client: Halton Region
Location: #5 : South Boiler Room
Survey Date: 2023-06-02

Site: Buildings
Floor: 1

Building Name: Rotary Gardens
Room #:
Last Re-Assessment: 0000-00-00

Area (sqft): 0

ASBESTOS																
System	Component	Material	Item	Covering	A*	V*	AP*	Good	Fair	Poor	Unit	Sample	Asbestos Type	Amount	Hazard	Friable
Ceiling		Drywall and joint compound			A	Y		800(7)			SF	V0006	Chrysotile	0.5-5%	Confirmed Asbestos	NF
Duct	Not Accessible															
Floor		Concrete (poured)			A	Y										
Floor		Vinyl Floor Tile and Mastic, 12x12 beige with white fleck			A	Y		200			SF	V0004	None Detected	N.D.	None	
Floor		Vinyl Floor Tile and Mastic, 9x9 white with brown streaks			A	Y		15(7)		5(3)	SF	S0008ABC	Chrysotile	0.5-5%	Confirmed Asbestos	NF
Mechanical Equipment		Fibreglass			A	Y										
Other		Firestopping (Cementitious)			A	Y		10			SF	S0009ABC	None Detected	N.D.	None	
Piping	Not Accessible															
Structure	Not Accessible															
Wall		Drywall and joint compound			A	Y		600(7)			SF	S0006ABC	Chrysotile	0.5-5%	Confirmed Asbestos	NF
Wall		Drywall and joint compound, Yellow			A	Y		200(7)			SF	S0005ABC	Chrysotile	0.5-5%	Confirmed Asbestos	NF
Wall		Masonry			A	Y										
Wall		Paint, Concrete block			A	Y		800			SF	S0007ABC	None Detected	N.D.	None	

Quantities shown above are based on visual approximations only and may be subject to variation. Copyright Pinchin Ltd. 2023

HMIS HAZARDOUS MATERIALS INVENTORY SYSTEM

ALL DATA REPORT

PINCHIN 1.855.PINCHIN www.pinchin.com

Client: Halton Region
Location: #6 : North Boiler Room
Survey Date: 2023-06-02

Site: Buildings
Floor: 1

Building Name: Rotary Gardens
Room #:
Last Re-Assessment: 0000-00-00

Area (sqft): 0

ASBESTOS																
System	Component	Material	Item	Covering	A*	V*	AP*	Good	Fair	Poor	Unit	Sample	Asbestos Type	Amount	Hazard	Friable
Ceiling		Drywall and joint compound			A	Y		800(7)			SF	V0001	Chrysotile	0.5-5%	Confirmed Asbestos	NF
Duct	Not Accessible															
Floor		Concrete (poured)			A	Y										
Floor		Vinyl Floor Tile and Mastic, 12x12 beige with white fleck			A	Y		200			SF	S0004ABC	None Detected	N.D.	None	
Mechanical Equipment		Fibreglass			A	Y										
Other		Firestopping (mastic), Purple			A	Y		2			SF	S0002ABC	None Detected	N.D.	None	
Piping	Not Accessible															
Structure	Not Accessible															
Wall		Drywall and joint compound			A	Y		600(7)			SF	S0001ABC	Chrysotile	0.5-5%	Confirmed Asbestos	NF
Wall		Masonry			A	Y										
Wall		Paint, Concrete block			A	Y		800			SF	S0003ABC	None Detected	N.D.	None	

Quantities shown above are based on visual approximations only and may be subject to variation. Copyright Pinchin Ltd. 2023

HMIS
HAZARDOUS MATERIALS INVENTORY SYSTEM

ALL DATA REPORT

PINCHIN
1.855.PINCHIN www.pinchin.com

Legend:

Sample number	
S####	Asbestos sample collected
V####	Material visually similar to numbered sample collected
V0000	Known non-asbestos material
V9000	Visually identified as an asbestos material
V9500	Material is presumed to be an asbestos material

Units	
SF	Square feet
LF	Linear feet
EA	Each
%	Percentage

Other	
A	Access
V	Visible
AP	Air Plenum
F	Friable material
NF	Non Friable material
PF	Potentially Friable material

Access	
A	Accessible to all building occupants
B	Accessible to maintenance and operations staff without a ladder
C	Accessible to maintenance and operations staff with a ladder. Also rarely entered, locked areas
D	Not normally accessible

Condition	
Good	No visible damage or deterioration
Fair	Minor, repairable damage, cracking, delamination or deterioration
Poor	Irreparable damage or deterioration with exposed and missing material

Visible	
Y	The material is visible when standing on the floor of the room, without the removal or opening of other building components (e.g. ceiling tiles or access panels).
N	The material is not visible to view when standing on the floor of the room and requires the removal of a building component (e.g. ceilings tiles or access panels) to view and access. Includes rarely entered crawlspaces, attic spaces, etc. Observations will be limited to the extent visible from the access points.

Air Plenum	
Yes or No	The material is in a return air plenum or in a direct airstream or there is evidence of air erosion (e.g. duct for heating or cooling blowing directly on or across an ACM). This field is only completed where Air Plenum consideration is required by regulation.

Colour Coding	
	The material is known to contain regulated concentrations of asbestos; either by analytical results or visible identification (use of the V9000 code).
	The material is presumed to contain asbestos; based on visual appearances; typically a material known to historically contain asbestos; however, not sampled due to limited access or the destructive nature of the sampling.

Action					
(1)	Clean up of ACM Debris	(2)	Precautions for Access Which may Disturb ACM Debris	(3)	ACM removal
(4)	Precautions for Work Which may Disturb ACM in Poor Condition	(5)	Proactive ACM removal (Minimum repair required for fair condition)	(6)	ACM repair
(7)	Management program and surveillance				

Quantities shown above are based on visual approximations only and may be subject to variation. Copyright Pinchin Ltd. 2023

ATTACHMENTS

ATTACHMENT "A"

BID BOND

BID BOND

Standard Construction Document

CCDC 220 - 2002

No. _____ Bond Amount $_____

_____ as Principal, hereinafter called the Principal, and

_____ a corporation created and existing under the laws

of _____ and duly authorized to transact the business of Suretyship in _____ as Surety, hereinafter called the Surety, are held and firmly bound unto _____ as Obligee, hereinafter called the Obligee, in the amount of _____

_____ Dollars ($ _____) lawful money of Canada, for the payment of which sum the Principal and the Surety bind themselves, their heirs, executors, administrators, successors and assigns, jointly and severally.

WHEREAS, the Principal has submitted a written bid to the Obligee, dated _____ day of _____, in the year _____

for _____

_____

The condition of this obligation is such that if the Principal shall have the bid accepted within the time period prescribed in the Obligee's bid documents, or, if no time period is specified in the Obligee's bid documents, within _____ ( ) days from the closing date as specified in the Obligee's bid documents, and the Principal enters into a formal contract and gives the specified security, then this obligation shall be void; otherwise, provided the Obligee takes all reasonable steps to mitigate the amount of such excess costs, the Principal and the Surety will pay to the Obligee the difference in money between the amount of the bid of the Principal and the amount for which the Obligee legally contracts with another party to perform the work if the latter amount be in excess of the former.

The Principal and Surety shall not be liable for a greater sum than the Bond Amount.

It is a condition of this bond that any suit or action must be commenced within seven (7) months of the date of this Bond.

No right of action shall accrue hereunder to or for the use of any person or corporation other than the Obligee named herein, or the heirs, executors, administrators or successors of the Obligee.

IN WITNESS WHEREOF, the Principal and the Surety have Signed and Sealed this Bond dated _____ day of _____, in the year _____ .

SIGNED and SEALED

in the presence of

ATTORNEY IN FACT

Principal

_____
Signature

_____
Name of person signing

Surety

_____
Signature

_____
Name of person signing

CCDC Copyright 2002
Canadian Construction Documents Committee

(CCDC 220 – 2002 has been approved by the Surety Association of Canada)

ATTACHMENT "B"

AGREEMENT TO BOND

We, the undersigned, hereby agree to become bound as Surety for _____ (hereinafter referred to as the Proponent) for a Performance Bond totalling fifty percent (50%) of the Total Bid Price (including HST) and for a Labour & Material Payment Bond totalling fifty per cent (50%) of the Total Bid Price (including HST) all conforming to the Contract Documents, for the full and due performance of the work shown as described therein and for the payment of all labour and materials and maintenance, if the Proposal for the construction of

RFP # 1260-24 Rotary Gardens Power and HVAC Upgrades

_____

is accepted by Halton Community Housing Corporation.

It is a condition of this Agreement to Bond that if the above-mentioned Proposal is accepted, the undersigned will supply the above-specified bonds within ten (10) days from the day upon which notification of selection of the Proposal is provided.

This Agreement to Bond shall remain valid for the duration of the Irrevocability Period as set out in Request for Proposals Section 1.11 – Award and Irrevocability of Proposal.

The surety acknowledges that a digitally signed and sealed Performance Bond and Labour & Material Bond delivered to the Region on behalf of HCHC by electronic means are:

i. permitted under the *Electronic Commerce Act, 2000,* S.O. 2000, c. 17;
ii. binding on the surety;
iii. enforceable in accordance with the surety's terms and enforceable in law;
iv. for the purposes of any applicable statutory or common laws, regulations or guidelines, deemed to be originals hand delivered to the Region and HCHC; and
v. on the basis of the forgoing, the surety acknowledges and agrees that it would be estopped from and covenants not to challenge the enforceability of the bonds on the basis that each are digitally signed and sealed and delivered to the Region on behalf of HCHC by electronic means.

DATED this ____ day of _____, 2024

_____
Name of Surety Company

_____
Signature of Authorized Person Signing for Company

(Company Seal)

_____
Title

NOTE: Surety must be licensed to conduct surety and insurance business in Canada or in Ontario, satisfactory to the Region in its reasonable discretion.

ATTACHMENT “C”

AGREEMENT BETWEEN OWNER AND CONTRACTOR (CCDC 2 - 2020)

CCDC 2

CCDC 2

Stipulated Price Contract

2020

[Name of Project]

Apply a CCDC 2 copyright seal here. The application of the seal demonstrates the intention of the party proposing the use of this document that it be an accurate and unamended form of CCDC 2 – 2020 except to the extent that any alterations, additions or modifications are set forth in supplementary conditions.

CANADIAN CONSTRUCTION DOCUMENTS COMMITTEE
CANADIAN CONSTRUCTION DOCUMENTS COMMITTEE
CANADIAN CONSTRUCTION DOCUMENTS COMMITTEE

CCDC 2 STIPULATED PRICE CONTRACT

TABLE OF CONTENTS

CCDC 2 is the product of a consensus-building process aimed at balancing the interests of all parties on the construction project. It reflects recommended industry practices. The CCDC and its constituent member organizations do not accept any responsibility or liability for loss or damage which may be suffered as a result of the use or interpretation of CCDC 2.

CCDC Copyright 2020
Must not be copied in whole or in part without the written permission of the CCDC.

AGREEMENT BETWEEN OWNER AND CONTRACTOR
For use when a stipulated price is the basis of payment.

This Agreement made on day of in the year .
by and between the parties

hereinafter called the "*Owner"*

and

hereinafter called the "*Contractor*"

The *Owner* and the *Contractor* agree as follows:

ARTICLE A-1 THE WORK

The *Contractor* shall:

1.1 perform the *Work* required by the *Contract Documents* for *(insert below the description or title of the Work)*

located at *(insert below the Place of the Work)*

for which the Agreement has been signed by the parties, and for which *(insert below the name of the Consultant)*

is acting as and is hereinafter called the "*Consultant*" and

1.2 do and fulfill everything indicated by the *Contract Documents*, and

1.3 commence the *Work* by the day of in the year and, subject to adjustment in *Contract Time* as provided for in the *Contract Documents*, attain *Ready-for-Takeover*, by the day of in the year .

ARTICLE A-2 AGREEMENTS AND AMENDMENTS

2.1 The *Contract* supersedes all prior negotiations, representations or agreements, either written or oral, relating in any manner to the *Work*, including the bid documents that are not expressly listed in Article A-3 of the Agreement – CONTRACT DOCUMENTS.

2.2 The *Contract* may be amended only as provided in the *Contract Documents*.

Note: This contract is protected by copyright. Use of a CCDC 2 document not containing a CCDC 2 copyright seal constitutes an infringement of copyright. Only sign this contract if the document cover page bears a CCDC 2 copyright seal to demonstrate that it is intended by the parties to be an accurate and unamended version of CCDC 2 – 2020 except to the extent that any alterations, additions or modifications are set forth in supplementary conditions.

ARTICLE A-3 CONTRACT DOCUMENTS

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
- General Conditions
- *

* *(Insert here, attaching additional pages if required, a list identifying all other Contract Documents e.g. supplementary conditions; Division 01 of the Specifications – GENERAL REQUIREMENTS; Project information that the Contractor may rely upon; technical Specifications, giving a list of contents with section numbers and titles, number of pages and date; material finishing schedules; Drawings, giving drawing number, title, date, revision date or mark; addenda, giving title, number, date; time schedule)*

Note: This contract is protected by copyright. Use of a CCDC 2 document not containing a CCDC 2 copyright seal constitutes an infringement of copyright. Only sign this contract if the document cover page bears a CCDC 2 copyright seal to demonstrate that it is intended by the parties to be an accurate and unamended version of CCDC 2 – 2020 except to the extent that any alterations, additions or modifications are set forth in supplementary conditions.

ARTICLE A-4 CONTRACT PRICE

4.1 The *Contract Price*, which excludes *Value Added Taxes*, is:

/100 dollars $

4.2 *Value Added Taxes* (of _____ %) payable by the *Owner* to the *Contractor* are:

/100 dollars $

4.3 Total amount payable by the *Owner* to the *Contractor* for the *Work* is:

/100 dollars $

4.4 These amounts shall be subject to adjustments as provided in the *Contract Documents*.

4.5 All amounts are in Canadian funds.

ARTICLE A-5 PAYMENT

5.1 Subject to the provisions of the *Contract Documents* and *Payment Legislation*, and in accordance with legislation and statutory regulations respecting holdback percentages, the *Owner* shall:

.1 make progress payments to the *Contractor* on account of the *Contract Price* when due in the amount certified by the *Consultant* unless otherwise prescribed by *Payment Legislation* together with such *Value Added Taxes* as may be applicable to such payments,

.2 upon *Substantial Performance of the Work*, pay to the *Contractor* the unpaid balance of the holdback amount when due together with such *Value Added Taxes* as may be applicable to such payment, and

.3 upon the issuance of the final certificate for payment, pay to the *Contractor* the unpaid balance of the *Contract Price* when due together with such *Value Added Taxes* as may be applicable to such payment.

5.2 Interest

.1 Should either party fail to make payments as they become due under the terms of the *Contract* or in an award by adjudication, arbitration or court, interest at the following rates on such unpaid amounts shall also become due and payable until payment:

(1) 2% per annum above the prime rate for the first 60 days.

(2) 4% per annum above the prime rate after the first 60 days.

Such interest shall be compounded on a monthly basis. The prime rate shall be the rate of interest quoted by

(Insert name of chartered lending institution whose prime rate is to be used)

for prime business loans as it may change from time to time.

.2 Interest shall apply at the rate and in the manner prescribed by paragraph 5.2.1 of this Article on the settlement amount of any claim in dispute that is resolved either pursuant to Part 8 of the General Conditions – DISPUTE RESOLUTION or otherwise, from the date the amount would have been due and payable under the *Contract*, had it not been in dispute, until the date it is paid.

ARTICLE A-6 RECEIPT OF AND ADDRESSES FOR NOTICES IN WRITING

6.1 *Notices in Writing* will be addressed to the recipient at the address set out below.

6.2 The delivery of a *Notice in Writing* will be by hand, by courier, by prepaid first class mail, or by other form of electronic communication during the transmission of which no indication of failure of receipt is communicated to the sender.

6.3 A *Notice in Writing* delivered by one party in accordance with this *Contract* will be deemed to have been received by the other party on the date of delivery if delivered by hand or courier, or if sent by mail it will be deemed to have been received five calendar days after the date on which it was mailed, provided that if either such day is not a *Working Day*, then the *Notice in Writing* will be deemed to have been received on the *Working Day* next following such day.

6.4 A *Notice in Writing* sent by any form of electronic communication will be deemed to have been received on the date of its transmission provided that if such day is not a *Working Day* or if it is received after the end of normal business hours on the date of its transmission at the place of receipt, then it will be deemed to have been received at the opening of business at the place of receipt on the first *Working Day* next following the transmission thereof.

6.5 An address for a party may be changed by *Notice in Writing* to the other party setting out the new address in accordance with this Article.

Note: This contract is protected by copyright. Use of a CCDC 2 document not containing a CCDC 2 copyright seal constitutes an infringement of copyright. Only sign this contract if the document cover page bears a CCDC 2 copyright seal to demonstrate that it is intended by the parties to be an accurate and unamended version of CCDC 2 – 2020 except to the extent that any alterations, additions or modifications are set forth in supplementary conditions.

Owner

*name of Owner**

address

email address

Contractor

*name of Contractor**

address

email address

Consultant

*name of Consultant**

address

email address

*** If it is intended that a specific individual must receive the notice, that individual's name shall be indicated.*

ARTICLE A-7 LANGUAGE OF THE CONTRACT

7.1 When the *Contract Documents* are prepared in both the English and French languages, it is agreed that in the event of any apparent discrepancy between the English and French versions, the English / French # language shall prevail.
 # Complete this statement by striking out inapplicable term.

7.2 This Agreement is drawn in English at the request of the parties hereto. La présente convention est rédigée en anglais à la demande des parties.

ARTICLE A-8 SUCCESSION

8.1 The *Contract* shall enure to the benefit of and be binding upon the parties hereto, their respective heirs, legal representatives, successors, and assigns.

Note: This contract is protected by copyright. Use of a CCDC 2 document not containing a CCDC 2 copyright seal constitutes an infringement of copyright. Only sign this contract if the document cover page bears a CCDC 2 copyright seal to demonstrate that it is intended by the parties to be an accurate and unamended version of CCDC 2 – 2020 except to the extent that any alterations, additions or modifications are set forth in supplementary conditions.

In witness whereof the parties hereto have executed this Agreement by the hands of their duly authorized representatives.

SIGNED AND DELIVERED
in the presence of:

WITNESS

_____
signature

_____
name of person signing

OWNER

_____
name of Owner

_____
signature

_____
name and title of person signing

WITNESS

_____
signature

_____
name of person signing

CONTRACTOR

_____
name of Contractor

_____
signature

_____
name and title of person signing

N.B. *Where legal jurisdiction, local practice or Owner or Contractor requirement calls for:*
(a) proof of authority to execute this document, attach such proof of authority in the form of a certified copy of a resolution naming the representative(s) authorized to sign the Agreement for and on behalf of the corporation or partnership; or
(b) the affixing of a corporate seal, this Agreement should be properly sealed.

Note: This contract is protected by copyright. Use of a CCDC 2 document not containing a CCDC 2 copyright seal constitutes an infringement of copyright. Only sign this contract if the document cover page bears a CCDC 2 copyright seal to demonstrate that it is intended by the parties to be an accurate and unamended version of CCDC 2 – 2020 except to the extent that any alterations, additions or modifications are set forth in supplementary conditions.

DEFINITIONS

The following Definitions shall apply to all *Contract Documents*.

Change Directive

A *Change Directive* is a written instruction prepared by the *Consultant* and signed by the *Owner* directing the *Contractor* to proceed with a change in the *Work* within the general scope of the *Contract Documents* prior to the *Owner* and the *Contractor* agreeing upon adjustments in the *Contract Price* and the *Contract Time*.

Change Order

A *Change Order* is a written amendment to the *Contract* prepared by the *Consultant* and signed by the *Owner* and the *Contractor* stating their agreement upon:

- a change in the *Work*;
- the method of adjustment or the amount of the adjustment in the *Contract Price*, if any; and
- the extent of the adjustment in the *Contract Time*, if any.

Construction Equipment

Construction Equipment means all machinery and equipment, either operated or not operated, that is required for preparing, fabricating, conveying, erecting, or otherwise performing the *Work* but is not incorporated into the *Work*.

Consultant

The *Consultant* is the person or entity engaged by the *Owner* and identified as such in the Agreement. The *Consultant* is the Architect, the Engineer or entity licensed to practise in the province or territory of the *Place of the Work*.

Contract

The *Contract* is the undertaking by the parties to perform their respective duties, responsibilities and obligations as prescribed in the *Contract Documents* and represents the entire agreement between the parties.

Contract Documents

The *Contract Documents* consist of those documents listed in Article A-3 of the Agreement – CONTRACT DOCUMENTS and amendments agreed upon between the parties.

Contract Price

The *Contract Price* is the amount stipulated in Article A-4 of the Agreement – CONTRACT PRICE.

Contract Time

The *Contract Time* is the time from commencement of the *Work* to the date of *Ready-for-Takeover* as stipulated in paragraph 1.3 of Article A-1 of the Agreement – THE WORK .

Contractor

The *Contractor* is the person or entity identified as such in the Agreement.

Drawings

The *Drawings* are the graphic and pictorial portions of the *Contract Documents*, wherever located and whenever issued, showing the design, location and dimensions of the *Work*, generally including plans, elevations, sections, details, and diagrams.

Notice in Writing

A *Notice in Writing*, where identified in the *Contract Documents*, is a written communication between the parties or between them and the *Consultant* that is transmitted in accordance with the provisions of Article A-6 of the Agreement – RECEIPT OF AND ADDRESSES FOR NOTICES IN WRITING.

Owner

The *Owner* is the person or entity identified as such in the Agreement.

Other Contractor

Other Contractor means a contractor, other than the *Contractor* or a *Subcontractor*, engaged by the *Owner* for the *Project*.

Payment Legislation

Payment Legislation means such legislation in effect at the *Place of the Work* which governs payment under construction contracts.

Place of the Work

The *Place of the Work* is the designated site or location of the *Work* identified in the *Contract Documents*.

Product

Product or Products means material, machinery, equipment, and fixtures forming part of the *Work*, but does not include *Construction Equipment.*

Note: This contract is protected by copyright. Use of a CCDC 2 document not containing a CCDC 2 copyright seal constitutes an infringement of copyright. Only sign this contract if the document cover page bears a CCDC 2 copyright seal to demonstrate that it is intended by the parties to be an accurate and unamended version of CCDC 2 – 2020 except to the extent that any alterations, additions or modifications are set forth in supplementary conditions.

Project

The *Project* means the total construction contemplated of which the *Work* may be the whole or a part.

Ready-for-Takeover

Ready-for-Takeover shall have been attained when the conditions set out in paragraph 12.1.1 of GC 12.1 – READY-FOR-TAKEOVER have been met, as verified by the *Consultant* pursuant to paragraph 12.1.4.2 of GC 12.1 – READY-FOR-TAKEOVER.

Shop Drawings

Shop Drawings are drawings, diagrams, illustrations, schedules, performance charts, brochures, *Product* data, and other data which the *Contractor* provides to illustrate details of portions of the *Work*.

Specifications

The *Specifications* are that portion of the *Contract Documents*, wherever located and whenever issued, consisting of the written requirements and standards for *Products*, systems, workmanship, quality, and the services necessary for the performance of the *Work*.

Subcontractor

A *Subcontractor* is a person or entity having a direct contract with the *Contractor* to perform a part or parts of the *Work* at the *Place of the Work*.

Substantial Performance of the Work

Substantial Performance of the Work is as defined in the lien legislation applicable to the *Place of the Work*.

Supplemental Instruction

A *Supplemental Instruction* is an instruction, not involving adjustment in the *Contract Price* or *Contract Time*, in the form of *Specifications*, *Drawings*, schedules, samples, models, or written instructions, consistent with the intent of the *Contract Documents*. It is to be issued by the *Consultant* to supplement the *Contract Documents* as required for the performance of the *Work*.

Supplier

A *Supplier* is a person or entity having a direct contract with the *Contractor* to supply *Products*.

Temporary Work

Temporary Work means temporary supports, structures, facilities, services, and other temporary items, excluding *Construction Equipment*, required for the execution of the *Work* but not incorporated into the *Work*.

Value Added Taxes

Value Added Taxes means such sum as shall be levied upon the *Contract Price* by the Federal or any Provincial or Territorial Government and is computed as a percentage of the *Contract Price* and includes the Goods and Services Tax, the Quebec Sales Tax, the Harmonized Sales Tax, and any similar tax, the collection and payment of which have been imposed on the *Contractor* by tax legislation.

Work

The *Work* means the total construction and related services required by the *Contract Documents*.

Working Day

Working Day means a day other than a Saturday, Sunday, statutory holiday, or statutory vacation day that is observed by the construction industry in the area of the *Place of the Work*.

Note: This contract is protected by copyright. Use of a CCDC 2 document not containing a CCDC 2 copyright seal constitutes an infringement of copyright. Only sign this contract if the document cover page bears a CCDC 2 copyright seal to demonstrate that it is intended by the parties to be an accurate and unamended version of CCDC 2 – 2020 except to the extent that any alterations, additions or modifications are set forth in supplementary conditions.

GENERAL CONDITIONS

PART 1 GENERAL PROVISIONS

GC 1.1 CONTRACT DOCUMENTS

1.1.1 The intent of the *Contract Documents* is to include the labour, *Products* and services necessary for the performance of the *Work* by the *Contractor* in accordance with these documents. It is not intended, however, that the *Contractor* shall supply products or perform work not consistent with, not covered by, or not properly inferable from the *Contract Documents*.

1.1.2 The *Contract Documents* are complementary, and what is required by one shall be as binding as if required by all. Performance by the *Contractor* shall be required only to the extent consistent with the *Contract Documents*.

1.1.3 The *Contractor* shall review the *Contract Documents* for the purpose of facilitating co-ordination and execution of the *Work* by the *Contractor*.

1.1.4 The *Contractor* is not responsible for errors, omissions or inconsistencies in the *Contract Documents.* If there are perceived errors, omissions or inconsistencies discovered by or made known to the *Contractor*, the *Contractor* shall promptly report to the *Consultant* and shall not proceed with the work affected until the *Contractor* has received corrected or additional information from the *Consultant*.

1.1.5 If there is a conflict within the *Contract Documents*:

.1 the order of priority of documents, from highest to lowest, shall be

- the Agreement between *Owner* and *Contractor*,
- the Definitions,
- Supplementary Conditions,
- the General Conditions,
- Division 01 of the *Specifications*,
- technical *Specifications*,
- material and finishing schedules,
- the *Drawings*.

.2 *Drawings* of larger scale shall govern over those of smaller scale of the same date.

.3 dimensions shown on *Drawings* shall govern over dimensions scaled from *Drawings*.

.4 amended or later dated documents shall govern over earlier documents of the same type.

.5 noted materials and annotations shall govern over graphic indications.

1.1.6 Nothing contained in the *Contract Documents* shall create any contractual relationship between:

.1 the *Owner* and a *Subcontractor*, a *Supplier*, or their agent, employee, or other person performing any portion of the *Work*.

.2 the *Consultant* and the *Contractor*, a *Subcontractor*, a *Supplier*, or their agent, employee, or other person performing any portion of the *Work*.

1.1.7 Words and abbreviations which have well known technical or trade meanings are used in the *Contract Documents* in accordance with such recognized meanings.

1.1.8 References in the *Contract Documents* to the singular shall be considered to include the plural as the context requires.

1.1.9 Neither the organization of the *Specifications* nor the arrangement of *Drawings* shall control the *Contractor* in dividing the work among *Subcontractors* and *Suppliers*.

1.1.10 *Specifications*, *Drawings*, models, and copies thereof furnished by the *Consultant* are and shall remain the *Consultant*'s property, with the exception of the signed *Contract* sets, which shall belong to each party to the *Contract*. All *Specifications*, *Drawings* and models furnished by the *Consultant* are to be used only with respect to the *Work* and are not to be used on other work. These *Specifications*, *Drawings* and models are not to be copied or altered in any manner without the written authorization of the *Consultant*.

1.1.11 Physical models furnished by the *Contractor* at the *Owner*'s expense are the property of the *Owner*.

GC 1.2 LAW OF THE CONTRACT

1.2.1 The law of the *Place of the Work* shall govern the interpretation of the *Contract*.

GC 1.3 RIGHTS AND REMEDIES

1.3.1 Except as expressly provided in the *Contract Documents*, the duties and obligations imposed by the *Contract Documents* and the rights and remedies available thereunder shall be in addition to and not a limitation of any duties, obligations, rights, and remedies otherwise imposed or available by law.

Note: This contract is protected by copyright. Use of a CCDC 2 document not containing a CCDC 2 copyright seal constitutes an infringement of copyright. Only sign this contract if the document cover page bears a CCDC 2 copyright seal to demonstrate that it is intended by the parties to be an accurate and unamended version of CCDC 2 – 2020 except to the extent that any alterations, additions or modifications are set forth in supplementary conditions.

1.3.2 No action or failure to act by the *Owner*, the *Consultant* or the *Contractor* shall constitute a waiver of any right or duty afforded any of them under the *Contract*, nor shall any such action or failure to act constitute an approval of or acquiescence in any breach thereunder, except as may be specifically agreed in writing.

GC 1.4 ASSIGNMENT

1.4.1 Neither party to the *Contract* shall assign the *Contract* or a portion thereof without the written consent of the other, which consent shall not be unreasonably withheld.

PART 2 ADMINISTRATION OF THE CONTRACT

GC 2.1 AUTHORITY OF THE CONSULTANT

2.1.1 The *Consultant* will have authority to act on behalf of the *Owner* only to the extent provided in the *Contract Documents*, unless otherwise modified by written agreement as provided in paragraph 2.1.2.

2.1.2 The duties, responsibilities and limitations of authority of the *Consultant* as set forth in the *Contract Documents* shall be modified or extended only with the written consent of the *Owner*, the *Consultant* and the *Contractor*.

GC 2.2 ROLE OF THE CONSULTANT

2.2.1 The *Consultant* will provide administration of the *Contract* as described in the *Contract Documents*.

2.2.2 The *Consultant* will visit the *Place of the Work* at intervals appropriate to the progress of construction to become familiar with the progress and quality of the work and to determine if the *Work* is proceeding in general conformity with the *Contract Documents*.

2.2.3 If the *Owner* and the *Consultant* agree, the *Consultant* will provide at the *Place of the Work*, one or more project representatives to assist in carrying out the *Consultant*'s responsibilities. The duties, responsibilities and limitations of authority of such project representatives shall be as set forth in writing to the *Contractor*.

2.2.4 Based on the *Consultant*'s observations and evaluation of the *Contractor*'s applications for payment, the *Consultant* will determine the amounts owing to the *Contractor* under the *Contract* and will issue certificates for payment as provided in Article A-5 of the Agreement – PAYMENT, GC 5.3 – PAYMENT and GC 5.5 – FINAL PAYMENT.

2.2.5 The *Consultant* will not be responsible for and will not have control, charge or supervision of construction means, methods, techniques, sequences, or procedures, or for safety precautions and programs required in connection with the *Work* in accordance with the applicable construction safety legislation, other regulations or general construction practice. The *Consultant* will not be responsible for the *Contractor*'s failure to perform the *Work* in accordance with the *Contract Documents*.

2.2.6 Except with respect to GC 5.1 – FINANCING INFORMATION REQUIRED OF THE OWNER, the *Consultant* will be, in the first instance, the interpreter of the requirements of the *Contract Documents*.

2.2.7 Matters in question relating to the performance of the *Work* or the interpretation of the *Contract Documents* shall be initially referred in writing to the *Consultant* by the party raising the question for interpretations and findings and copied to the other party.

2.2.8 Interpretations and findings of the *Consultant* shall be consistent with the intent of the *Contract Documents*. In making such interpretations and findings the *Consultant* will not show partiality to either the *Owner* or the *Contractor*.

2.2.9 The *Consultant*'s interpretations and findings will be given in writing to the parties within a reasonable time.

2.2.10 With respect to claims for a change in *Contract Price*, the *Consultant* will make findings as set out in GC 6.6 – CLAIMS FOR A CHANGE IN CONTRACT PRICE.

2.2.11 The *Consultant* will have authority to reject work which in the *Consultant*'s opinion does not conform to the requirements of the *Contract Documents*. Whenever the *Consultant* considers it necessary or advisable, the *Consultant* will have authority to require inspection or testing of work, whether or not such work is fabricated, installed or completed. However, neither the authority of the *Consultant* to act nor any decision either to exercise or not to exercise such authority shall give rise to any duty or responsibility of the *Consultant* to the *Contractor*, *Subcontractors*, *Suppliers,* or their agents, employees, or other persons performing any of the *Work*.

2.2.12 During the progress of the *Work* the *Consultant* will furnish *Supplemental Instructions* to the *Contractor* with reasonable promptness or in accordance with a schedule for such instructions agreed to by the *Consultant* and the *Contractor.*

2.2.13 The *Consultant* will review and take appropriate action upon *Shop Drawings*, samples and other submittals by the *Contractor*, in accordance with the *Contract Documents*.

Note: This contract is protected by copyright. Use of a CCDC 2 document not containing a CCDC 2 copyright seal constitutes an infringement of copyright. Only sign this contract if the document cover page bears a CCDC 2 copyright seal to demonstrate that it is intended by the parties to be an accurate and unamended version of CCDC 2 – 2020 except to the extent that any alterations, additions or modifications are set forth in supplementary conditions.

2.2.14 The *Consultant* will prepare *Change Orders* and *Change Directives* as provided in GC 6.2 – CHANGE ORDER and GC 6.3 – CHANGE DIRECTIVE.

2.2.15 The *Consultant* will conduct reviews of the *Work* to determine the date of *Substantial Performance of the Work* and verify that *Ready-for-Takeover* has been attained.

2.2.16 All certificates issued by the *Consultant* will be to the best of the *Consultant*'s knowledge, information and belief. By issuing any certificate, the *Consultant* does not guarantee the *Work* is correct or complete.

2.2.17 The *Consultant* will receive and review written warranties and related documents required by the *Contract* and provided by the *Contractor* and will forward such warranties and documents to the *Owner* for the *Owner*'s acceptance.

2..2.18 If the *Consultant*'s engagement is terminated, the *Owner* shall immediately engage a *Consultant* against whom the *Contractor* makes no reasonable objection and whose duties and responsibilities under the *Contract Documents* will be that of the former *Consultant*.

GC 2.3 REVIEW AND INSPECTION OF THE WORK

2.3.1 The *Owner* and the *Consultant* shall have access to the *Work* at all times. The *Contractor* shall provide sufficient, safe and proper facilities at all times for the review of the *Work* by the *Consultant* and the inspection of the *Work* by authorized agencies. If parts of the *Work* are in preparation at locations other than the *Place of the Work*, the *Owner* and the *Consultant* shall be given access to such work whenever it is in progress.

2.3.2 If work is designated for tests, inspections or approvals in the *Contract Documents*, by the *Consultant*'s instructions, or by the laws or ordinances of the *Place of the Work*, the *Contractor* shall give the *Consultant* reasonable notification of when the work will be ready for review and inspection. The *Contractor* shall arrange for and shall give the *Consultant* reasonable notification of the date and time of inspections by other authorities.

2.3.3 The *Contractor* shall furnish promptly to the *Consultant* two copies of certificates and inspection reports relating to the *Work*.

2.3.4 If the *Contractor* covers, or permits to be covered, work that has been designated for special tests, inspections or approvals before such special tests, inspections or approvals are made, given or completed, the *Contractor* shall, if so directed, uncover such work, have the inspections or tests satisfactorily completed, and make good covering work at the *Contractor*'s expense.

2.3.5 The *Consultant* may order any portion or portions of the *Work* to be examined to confirm that such work is in accordance with the requirements of the *Contract Documents*. If the work is not in accordance with the requirements of the *Contract Documents*, the *Contractor* shall correct the work and pay the cost of examination and correction. If the work is in accordance with the requirements of the *Contract Documents*, the *Owner* shall pay the cost of examination and restoration.

2.3.6 The *Contractor* shall pay the cost of making any test or inspection, including the cost of samples required for such test or inspection, if such test or inspection is designated in the *Contract Documents* to be performed by the *Contractor* or is required by the laws or ordinances applicable to the *Place of the Work*.

2.3.7 The *Contractor* shall pay the cost of samples required for any test or inspection to be performed by others if such test or inspection is designated in the *Contract Documents*.

GC 2.4 DEFECTIVE WORK

2.4.1 The *Contractor* shall promptly correct defective work that has been rejected by the *Consultant* as failing to conform to the *Contract Documents* whether or not the defective work was incorporated in the *Work* or the defect is the result of poor workmanship, use of defective products or damage through carelessness or other act or omission of the *Contractor*.

2.4.2 The *Contractor* shall make good promptly *Other Contractors'* work destroyed or damaged by such corrections at the *Contractor*'s expense.

2.4.3 If in the opinion of the *Consultant* it is not expedient to correct defective work or work not performed as provided in the *Contract Documents*, the *Owner* may deduct from the amount otherwise due to the *Contractor* the difference in value between the work as performed and that called for by the *Contract Documents*. If the *Owner* and the *Contractor* do not agree on the difference in value, they shall refer the matter to the *Consultant* for a finding.

PART 3 EXECUTION OF THE WORK

GC 3.1 CONTROL OF THE WORK

3.1.1 The *Contractor* shall have total control of the *Work* and shall effectively direct and supervise the *Work* so as to ensure conformity with the *Contract Documents*.

Note: This contract is protected by copyright. Use of a CCDC 2 document not containing a CCDC 2 copyright seal constitutes an infringement of copyright. Only sign this contract if the document cover page bears a CCDC 2 copyright seal to demonstrate that it is intended by the parties to be an accurate and unamended version of CCDC 2 – 2020 except to the extent that any alterations, additions or modifications are set forth in supplementary conditions.

3.1.2 The *Contractor* shall be solely responsible for construction means, methods, techniques, sequences, and procedures and for co-ordinating the various parts of the *Work* under the *Contract*.

GC 3.2 CONSTRUCTION BY THE OWNER OR OTHER CONTRACTORS

3.2.1 The *Owner* reserves the right to award separate contracts in connection with other parts of the *Project* to *Other Contractors* and to perform work with own forces.

3.2.2 When separate contracts are awarded for other parts of the *Project*, or when work is performed by the *Owner*'s own forces, the *Owner* shall:

.1 provide for the co-ordination of the activities and work of *Other Contractors* and the *Owner*'s own forces with the *Work* of the *Contract*;

.2 enter into separate contracts with *Other Contractors* under conditions of contract which are compatible with the conditions of the *Contract*;

.3 ensure that insurance coverage is provided to the same requirements as are called for in GC 11.1 – INSURANCE and co-ordinate such insurance with the insurance coverage of the *Contractor* as it affects the *Work*; and

.4 take all reasonable precautions to avoid labour disputes or other disputes on the *Project* arising from the work of *Other Contractors* or the *Owner*'s own forces.

3.2.3 When separate contracts are awarded for other parts of the *Project*, or when work is performed by the *Owner*'s own forces, the *Contractor* shall:

.1 afford the *Owner* and *Other Contractors* reasonable opportunity to store their products and execute their work;

.2 co-ordinate and schedule the *Work* with the work of *Other Contractors* or the *Owner*'s own forces that are identified in the *Contract Documents*;

.3 participate with *Other Contractors* and the *Owner* in reviewing their construction schedules when directed to do so; and

.4 report promptly to the *Consultant* in writing any apparent deficiencies in the work of *Other Contractors* or of the *Owner*'s own forces, where such work affects the proper execution of any portion of the *Work*, prior to proceeding with that portion of the *Work*.

3.2.4 Where a change in the *Work* is required as a result of the co-ordination and integration of the work of *Other Contractors* or *Owner*'s own forces with the *Work*, the changes shall be authorized and valued as provided in GC 6.1 – OWNER'S RIGHT TO MAKE CHANGES, GC 6.2 – CHANGE ORDER and GC 6.3 – CHANGE DIRECTIVE.

3.2.5 Disputes and other matters in question between the *Contractor* and *Other Contractors* shall be dealt with as provided in Part 8 of the General Conditions – DISPUTE RESOLUTION provided the *Other Contractors* have reciprocal obligations. The *Contractor* shall be deemed to have consented to arbitration of any dispute with any *Other Contractor* whose contract with the *Owner* contains a similar agreement to arbitrate. In the absence of *Other Contractors* having reciprocal obligations, disputes and other matters in question initiated by the *Contractor* against *Other Contractors* will be considered disputes and other matters in question between the *Contractor* and the *Owner*.

3.2.6 Should the *Owner*, the *Consultant*, *Other Contractors*, or anyone employed by them directly or indirectly be responsible for ill-timed work necessitating cutting or remedial work to be performed, the cost of such cutting or remedial work shall be valued as provided in GC 6.1 – OWNER'S RIGHT TO MAKE CHANGES, GC 6.2 – CHANGE ORDER and GC 6.3 – CHANGE DIRECTIVE.

GC 3.3 TEMPORARY WORK

3.3.1 The *Contractor* shall have the sole responsibility for the design, erection, operation, maintenance, and removal of *Temporary Work* unless otherwise specified in the *Contract Documents*.

3.3.2 The *Contractor* shall engage and pay for registered professional engineering personnel skilled in the appropriate disciplines to perform those functions referred to in paragraph 3.3.1 where required by law or by the *Contract Documents* and in all cases where such *Temporary Work* is of such a nature that professional engineering skill is required to produce safe and satisfactory results.

3.3.3 Notwithstanding the provisions of GC 3.1 – CONTROL OF THE WORK, paragraphs 3.3.1 and 3.3.2 or provisions to the contrary elsewhere in the *Contract Documents* where such *Contract Documents* include designs for *Temporary Work* or specify a method of construction in whole or in part, such designs or methods of construction shall be considered to be part of the design of the *Work* and the *Contractor* shall not be held responsible for that part of the design or the specified method of construction. The *Contractor* shall, however, be responsible for the execution of such design or specified method of construction in the same manner as for the execution of the *Work*.

Note: This contract is protected by copyright. Use of a CCDC 2 document not containing a CCDC 2 copyright seal constitutes an infringement of copyright. Only sign this contract if the document cover page bears a CCDC 2 copyright seal to demonstrate that it is intended by the parties to be an accurate and unamended version of CCDC 2 – 2020 except to the extent that any alterations, additions or modifications are set forth in supplementary conditions.

GC 3.4 CONSTRUCTION SCHEDULE

3.4.1 The *Contractor* shall:

.1 prepare and submit to the *Owner* and the *Consultant* prior to the first application for payment, a construction schedule that indicates the timing of the major activities of the *Work* and provides sufficient detail of the critical events and their inter-relationship to demonstrate the *Work* will be performed in conformity with the *Contract Time*;

.2 monitor the progress of the *Work* relative to the construction schedule and update the schedule on a monthly basis or as stipulated by the *Contract Documents*; and

.3 advise the *Consultant* of any revisions required to the schedule as the result of extensions of the *Contract Time* as provided in Part 6 of the General Conditions – CHANGES IN THE WORK.

GC 3.5 SUPERVISION

3.5.1 The *Contractor* shall provide all necessary supervision and appoint a competent representative who shall be in attendance at the *Place of the Work* while the *Work* is being performed. The appointed representative shall not be changed except for valid reason.

3.5.2 The appointed representative shall represent the *Contractor* at the *Place of the Work*. Information and instructions provided by the *Consultant* to the *Contractor*'s appointed representative shall be deemed to have been received by the *Contractor*, except with respect to Article A-6 of the Agreement – RECEIPT OF AND ADDRESSES FOR NOTICES IN WRITING.

GC 3.6 SUBCONTRACTORS AND SUPPLIERS

3.6.1 The *Contractor* shall preserve and protect the rights of the parties under the *Contract* with respect to work to be performed under subcontract, and shall:

.1 enter into contracts or written agreements with *Subcontractors* and *Suppliers* to require them to perform their work as provided in the *Contract Documents*;

.2 incorporate the applicable terms and conditions of the *Contract Documents* into all contracts or written agreements with *Subcontractors* and *Suppliers*; and

.3 be as fully responsible to the *Owner* for acts and omissions of *Subcontractors*, *Suppliers* and any persons directly or indirectly employed by them as for acts and omissions of persons directly employed by the *Contractor*.

3.6.2 The *Contractor* shall indicate in writing, if requested by the *Owner*, those *Subcontractors* or *Suppliers* whose bids have been received by the *Contractor* which the *Contractor* would be prepared to accept for the performance of a portion of the *Work*. Should the *Owner* not object before signing the *Contract*, the *Contractor* shall employ those *Subcontractors* or *Suppliers* so identified by the *Contractor* in writing for the performance of that portion of the *Work* to which their bid applies.

3.6.3 The *Owner* may, for reasonable cause, at any time before the *Owner* has signed the *Contract*, object to the use of a proposed *Subcontractor* or *Supplier* and require the *Contractor* to employ one of the other subcontract bidders.

3.6.4 If the *Owner* requires the *Contractor* to change a proposed *Subcontractor* or *Supplier*, the *Contract Price* and *Contract Time* shall be adjusted by the difference occasioned by such required change.

3.6.5 The *Contractor* shall not be required to employ as a *Subcontractor* or *Supplier*, a person or firm to which the *Contractor* may reasonably object.

3.6.6 The *Owner*, through the *Consultant*, may provide to a *Subcontractor* or *Supplier* information as to the percentage of the *Subcontractor*'s or *Supplier*'s work which has been certified for payment.

GC 3.7 LABOUR AND PRODUCTS

3.7.1 The *Contractor* shall maintain good order and discipline among the *Contractor*'s employees engaged on the *Work* and employ only workers that are skilled in the tasks assigned.

3.7.2 The *Contractor* shall provide and pay for labour, *Products*, tools, *Construction Equipment*, water, heat, light, power, transportation, and other facilities and services necessary for the performance of the *Work* in accordance with the *Contract*.

3.7.3 Unless otherwise specified in the *Contract Documents*, *Products* provided shall be new. *Products* which are not specified shall be of a quality consistent with those specified and their use acceptable to the *Consultant*.

GC 3.8 SHOP DRAWINGS

3.8.1 The *Contractor* shall provide *Shop Drawings* as required in the *Contract Documents*.

3.8.2 The *Contractor* shall provide *Shop Drawings* to the *Consultant* to review in accordance with an agreed schedule, or in the absence of an agreed schedule, in orderly sequence and sufficiently in advance so as to cause no delay in the *Work* or in the work of *Other Contractors* or the *Owner*'s own forces.

Note: This contract is protected by copyright. Use of a CCDC 2 document not containing a CCDC 2 copyright seal constitutes an infringement of copyright. Only sign this contract if the document cover page bears a CCDC 2 copyright seal to demonstrate that it is intended by the parties to be an accurate and unamended version of CCDC 2 – 2020 except to the extent that any alterations, additions or modifications are set forth in supplementary conditions.

3.8.3 The *Contractor* shall review all *Shop Drawings* before providing them to the *Consultant*. The *Contractor* represents by this review that:

.1 the *Contractor* has determined and verified all applicable field measurements, field construction conditions, *Product* requirements, catalogue numbers and similar data, or will do so, and

.2 the *Contractor* has checked and co-ordinated each *Shop Drawing* with the requirements of the *Work* and of the *Contract Documents*.

3.8.4 The *Consultant*'s review is for conformity to the design concept and for general arrangement only.

3.8.5 At the time of providing *Shop Drawings*, the *Contractor* shall expressly advise the *Consultant* in writing of any deviations in a *Shop Drawing* from the requirements of the *Contract Documents.* The *Consultant* shall indicate the acceptance or rejection of such deviation expressly in writing.

3.8.6 The *Consultant*'s review shall not relieve the *Contractor* of responsibility for errors or omissions in the *Shop Drawings* or for meeting all requirements of the *Contract Documents*.

3.8.7 The *Consultant* will review and return *Shop Drawings* in accordance with the schedule agreed upon, or, in the absence of such schedule, with reasonable promptness so as to cause no delay in the performance of the *Work*.

PART 4 ALLOWANCES

GC 4.1 CASH ALLOWANCES

4.1.1 The *Contract Price* includes the cash allowances, if any, stated in the *Contract Documents*. The scope of the *Work* or costs included in such cash allowances shall be as described in the *Contract Documents*.

4.1.2 The *Contract Price*, and not the cash allowances, includes the *Contractor*'s overhead and profit in connection with such cash allowances.

4.1.3 Expenditures under cash allowances shall be authorized by the *Owner* through the *Consultant*.

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

4.1.5 The net amount of any unexpended cash allowances, after providing for any reallocations as contemplated in paragraph 4.1.4, shall be deducted from the *Contract Price* by *Change Order* without any adjustment for the *Contractor's* overhead and profit on such amount.

4.1.6 The value of the *Work* performed under a cash allowance is eligible to be included in progress payments.

4.1.7 The *Contractor* and the *Consultant* shall jointly prepare a schedule that shows when the items called for under cash allowances must be ordered to avoid delaying the progress of the *Work*.

GC 4.2 CONTINGENCY ALLOWANCE

4.2.1 The *Contract Price* includes the contingency allowance, if any, stated in the *Contract Documents*.

4.2.2 The contingency allowance includes the *Contractor*'s overhead and profit in connection with such contingency allowance.

4.2.3 Expenditures under the contingency allowance shall be authorized and valued as provided in GC 6.1 – OWNER'S RIGHT TO MAKE CHANGES, GC 6.2 – CHANGE ORDER and GC 6.3 – CHANGE DIRECTIVE.

4.2.4 The *Contract Price* shall be adjusted by *Change Order* to provide for any difference between the expenditures authorized under paragraph 4.2.3 and the contingency allowance.

PART 5 PAYMENT

GC 5.1 FINANCING INFORMATION REQUIRED OF THE OWNER

5.1.1 The *Owner* shall, at the request of the *Contractor*, before signing the *Contract*, and promptly from time to time thereafter, furnish to the *Contractor* reasonable evidence that financial arrangements have been made to fulfill the *Owner*'s obligations under the *Contract*.

5.1.2 The *Owner* shall give the *Contractor Notice in Writing* of any material change in the *Owner*'s financial arrangements to fulfil the *Owner*'s obligations under the *Contract* during the performance of the *Contract*.

Note: This contract is protected by copyright. Use of a CCDC 2 document not containing a CCDC 2 copyright seal constitutes an infringement of copyright. Only sign this contract if the document cover page bears a CCDC 2 copyright seal to demonstrate that it is intended by the parties to be an accurate and unamended version of CCDC 2 – 2020 except to the extent that any alterations, additions or modifications are set forth in supplementary conditions.

GC 5.2 APPLICATIONS FOR PAYMENT

5.2.1 Applications for payment on account as provided in Article A-5 of the Agreement – PAYMENT shall be submitted monthly to the *Owner* and the *Consultant* simultaneously as the *Work* progresses.

5.2.2 Applications for payment shall be dated the last day of each payment period, which is the last day of the month or an alternative day of the month agreed in writing by the parties.

5.2.3 The amount claimed shall be for the value, proportionate to the amount of the *Contract*, of *Work* performed and *Products* delivered to the *Place of the Work* as of the last day of the payment period.

5.2.4 The *Contractor* shall submit to the *Consultant*, at least 15 calendar days before the first application for payment, a schedule of values for the parts of the *Work*, aggregating the total amount of the *Contract Price*, so as to facilitate evaluation of applications for payment.

5.2.5 The schedule of values shall be made out in such form as specified in the *Contract* and supported by such evidence as the *Consultant* may reasonably require.

5.2.6 Applications for payment shall be based on the schedule of values accepted by the *Consultant* and shall comply with the provisions of *Payment Legislation*.

5.2.7 Each application for payment shall include evidence of compliance with workers' compensation legislation at the *Place of the Work* and after the first payment, a declaration by the *Contractor* as to the distribution made of the amounts previously received using document CCDC 9A 'Statutory Declaration'.

5.2.8 Applications for payment for *Products* delivered to the *Place of the Work* but not yet incorporated into the *Work* shall be supported by such evidence as the *Consultant* may reasonably require to establish the value and delivery of the *Products*.

GC 5.3 PAYMENT

5.3.1 After receipt by the *Consultant* and the *Owner* of an application for payment submitted by the *Contractor* in accordance with GC 5.2 – APPLICATIONS FOR PAYMENT:

.1 The *Consultant* will issue to the *Owner* and copy to the *Contractor*, no later than 10 calendar days after the receipt of the application for payment, a certificate for payment in the amount applied for, or in such other amount as the *Consultant* determines to be properly due. If the *Consultant* certifies a different amount, or rejects the application or part thereof, the *Owner* shall promptly issue a written notice to the *Contractor* giving reasons for the revision or rejection, such written notice to be in compliance with *Payment Legislation*.

.2 The *Owner* shall make payment to the *Contractor* on account as provided in Article A-5 of the Agreement – PAYMENT on or before 28 calendar days after the receipt by the *Owner* and the *Consultant* of the application for payment, and in any event, in compliance with *Payment Legislation*.

GC 5.4 SUBSTANTIAL PERFORMANCE OF THE WORK AND PAYMENT OF HOLDBACK

5.4.1 The *Consultant* will review the *Work* to certify or verify the validity of the application for *Substantial Performance of the Work* and will promptly, and in any event, no later than 20 calendar days after receipt of the *Contractor*s application:

.1 advise the *Contractor* in writing that the *Work* or the designated portion of the *Work* is not substantially performed and give reasons why, or

.2 state the date of *Substantial Performance of the Work* or a designated portion of the *Work* in a certificate and issue a copy of that certificate to each of the *Owner* and the *Contractor*.

5.4.2 Where the holdback amount required by the applicable lien legislation has not been placed in a separate lien holdback account, the *Owner* shall, no later than 10 calendar days prior to the expiry of the holdback period stipulated in the lien legislation applicable to the *Place of the Work*, place the holdback amount in a bank account in the joint names of the *Owner* and the *Contractor*.

5.4.3 Subject to the requirements of any *Payment Legislation*, all holdback amount prescribed by the applicable lien legislation for the *Work* shall become due and payable to the *Contractor* no later than 10 *Working Days* following the expiration of the holdback period stipulated in the lien legislation applicable to the *Place of the Work*.

5.4.4 The *Contractor* shall submit an application for payment of the lien holdback amount in accordance with GC 5.3 – PAYMENT.

5.4.5 Where legislation permits progressive release of the holdback for a portion of the *Work* and the *Consultant* has certified or verified that the part of the *Work* has been performed prior to *Substantial Performance of the Work*, the *Owner* hereby agrees to release, and shall release, such portion to the *Contractor* in accordance with such legislation.

Note: This contract is protected by copyright. Use of a CCDC 2 document not containing a CCDC 2 copyright seal constitutes an infringement of copyright. Only sign this contract if the document cover page bears a CCDC 2 copyright seal to demonstrate that it is intended by the parties to be an accurate and unamended version of CCDC 2 – 2020 except to the extent that any alterations, additions or modifications are set forth in supplementary conditions.

5.4.6 Notwithstanding any progressive release of the holdback, the *Contractor* shall ensure that such parts of the *Work* are protected pending the issuance of a final certificate for payment and be responsible for the correction of defects or work not performed regardless of whether or not such was apparent when the holdback was released.

GC 5.5 FINAL PAYMENT

5.5.1 When the *Contractor* considers that the *Work* is completed, the *Contractor* shall submit an application for final payment.

5.5.2 The *Consultant* will, no later than 10 calendar days after the receipt of an application from the *Contractor* for final payment, review the *Work* to verify the validity of the application and when the *Consultant* finds the *Contractor*'s application for final payment valid, the *Consultant* will promptly issue a final certificate for payment to the *Owner,* with a copy to the *Contractor*.

5.5.3 If the *Consultant* rejects the application or part thereof, the *Owner* will promptly issue a written notice to the *Contractor* giving reasons for the revision or rejection, such written notice to be in compliance with *Payment Legislation*.

5.5.4 Subject to the provision of paragraph 10.4.1 of GC 10.4 – WORKERS' COMPENSATION, and any legislation applicable to the *Place of the Work*, the *Owner* shall, no later than 5 calendar days after the issuance of a final certificate for payment, pay the *Contractor* as provided in Article A-5 of the Agreement – PAYMENT and in any event, in compliance with *Payment Legislation*.

GC 5.6 DEFERRED WORK

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

GC 5.7 NON-CONFORMING WORK

5.7.1 No payment by the *Owner* under the *Contract* nor partial or entire use or occupancy of the *Work* by the *Owner* shall constitute an acceptance of any portion of the *Work* or *Products* which are not in accordance with the requirements of the *Contract Documents*.

PART 6 CHANGES IN THE WORK

GC 6.1 OWNER'S RIGHT TO MAKE CHANGES

6.1.1 The *Owner*, through the *Consultant*, without invalidating the *Contract*, may make:
.1 changes in the *Work* consisting of additions, deletions or other revisions to the *Work* by *Change Order* or *Change Directive*, and
.2 changes to the *Contract Time* for the *Work*, or any part thereof, by *Change Order*.

6.1.2 The *Contractor* shall not perform a change in the *Work* without a *Change Order* or a *Change Directive*.

GC 6.2 CHANGE ORDER

6.2.1 When a change in the *Work* is proposed or required, the *Consultant* will provide the *Contractor* with a written description of the proposed change in the *Work*. The *Contractor* shall promptly present to the *Consultant*, in a form that can be reasonably evaluated, 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*.

6.2.2 When the *Owner* and the *Contractor* agree to the adjustments in the *Contract Price* and *Contract Time* or to the method to be used to determine the adjustments, such agreement shall be effective immediately and shall be recorded in a *Change Order*. The value of the work performed as the result of a *Change Order* shall be included in the applications for progress payment.

GC 6.3 CHANGE DIRECTIVE

6.3.1 If the *Owner* requires the *Contractor* to proceed with a change in the *Work* prior to the *Owner* and the *Contractor* agreeing upon the corresponding adjustment in *Contract Price* and *Contract Time*, the *Owner*, through the *Consultant*, shall issue a *Change Directive*.

6.3.2 A *Change Directive* shall only be used to direct a change in the *Work* which is within the general scope of the *Contract Documents*.

6.3.3 A *Change Directive* shall not be used to direct a change in the *Contract Time* only.

Note: This contract is protected by copyright. Use of a CCDC 2 document not containing a CCDC 2 copyright seal constitutes an infringement of copyright. Only sign this contract if the document cover page bears a CCDC 2 copyright seal to demonstrate that it is intended by the parties to be an accurate and unamended version of CCDC 2 – 2020 except to the extent that any alterations, additions or modifications are set forth in supplementary conditions.

6.3.4 Upon receipt of a *Change Directive*, the *Contractor* shall proceed promptly with the change in the *Work*.

6.3.5 For the purpose of valuing *Change Directives*, changes in the *Work* that are not substitutions or otherwise related to each other shall not be grouped together in the same *Change Directive*.

6.3.6 The adjustment in the *Contract Price* for a change carried out by way of a *Change Directive* shall be determined on the basis of the cost of the *Contractor*'s actual expenditures and savings attributable to the *Change Directive*, valued in accordance with paragraph 6.3.7 and as follows:

.1 If the change results in a net increase in the *Contractor*'s cost, the *Contract Price* shall be increased by the amount of the net increase in the *Contractor*'s cost, plus the *Contractor*'s percentage fee on such net increase.

.2 If the change results in a net decrease in the *Contractor*'s cost, the *Contract Price* shall be decreased by the amount of the net decrease in the *Contractor*'s cost, without adjustment for the *Contractor*'s percentage fee.

.3 The *Contractor*'s fee shall be as specified in the *Contract Documents* or as otherwise agreed by the parties.

6.3.7 The cost of performing the work attributable to the *Change Directive* shall be limited to the actual cost of the following in as much as it contributes directly to the implementation of the *Change Directive*:

Labour

.1 rates that are listed in the schedule or as agreed by the *Owner* and the *Contractor* including wages, benefits, compensation, contributions, assessments, or taxes incurred for such items as employment insurance, provincial or territorial health insurance, workers' compensation, and Canada or Quebec Pension Plan for:

(1) trade labour in the direct employ of the *Contractor*;

(2) the *Contractor*'s personnel when stationed at the field office;

(3) the *Contractor*'s personnel engaged at shops or on the road, in expediting the production or transportation of materials or equipment; and

(4) the *Contractor*'s office personnel engaged in a technical capacity, or other personnel identified in Article A-3 of the Agreement – CONTRACT DOCUMENTS for the time spent in the performance of the *Work*;

Products, Construction Equipment and Temporary Work

.2 cost of all *Products* including cost of transportation thereof;

.3 in the absence of agreed rates, cost less salvage value of *Construction Equipment*, *Temporary Work* and tools, exclusive of hand tools under $1,000 owned by the *Contractor*;

.4 rental cost of *Construction Equipment*, *Temporary Work* and tools, exclusive of hand tools under $1,000;

.5 cost of all equipment and services required for the *Contractor*'s field office;

Subcontract

.6 subcontract amounts of Subcontractor with pricing mechanism approved by the *Owner*;

Others

.7 travel and subsistence expenses of the *Contractor*'s personnel described in paragraph 6.3.7.1;

.8 deposits lost provided that they are not caused by negligent acts or omissions of the *Contractor*;

.9 cost of quality assurance such as independent inspection and testing services;

.10 charges levied by authorities having jurisdiction at the *Place of the Work*;

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

.12 premium for all contract securities and insurance for which the *Contractor* is required, by the *Contract Documents*, to provide, maintain and pay in relation to the performance of the *Work*;

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

.14 taxes and duties, other than *Value Added Taxes*, income, capital, or property taxes, relating to the *Work* for which the *Contractor* is liable;

.15 charges for voice and data communications, courier services, expressage, transmittal and reproduction of documents, and petty cash items;

.16 cost for removal and disposal of waste products and debris;

.17 legal costs, incurred by the *Contractor*, in relation to the performance of the *Work* provided that they are not:

(1) relating to a dispute between the *Owner* and the *Contractor* unless such costs are part of a settlement or awarded by arbitration or court,

(2) the result of the negligent acts or omissions of the *Contractor*, or

(3) the result of a breach of this *Contract* by the *Contractor*;

.18 cost of auditing when requested by the *Owner*; and

.19 cost of *Project* specific information technology in accordance with the method determined by the parties.

Note: This contract is protected by copyright. Use of a CCDC 2 document not containing a CCDC 2 copyright seal constitutes an infringement of copyright. Only sign this contract if the document cover page bears a CCDC 2 copyright seal to demonstrate that it is intended by the parties to be an accurate and unamended version of CCDC 2 – 2020 except to the extent that any alterations, additions or modifications are set forth in supplementary conditions.

6.3.8 Notwithstanding any other provisions contained in the General Conditions of the *Contract*, it is the intention of the parties that the cost of any item under any cost element referred to in paragraph 6.3.7 shall cover and include any and all costs or liabilities attributable to the *Change Directive* other than those which are the result of or occasioned by any failure on the part of the *Contractor* to exercise reasonable care and diligence in the *Contractor*'s attention to the *Work*. Any cost due to failure on the part of the *Contractor* to exercise reasonable care and diligence in the *Contractor*'s performance of the *Work* attributable to the *Change Directive* shall be borne by the *Contractor*.

6.3.9 The *Contractor* shall keep full and detailed accounts and records necessary for the documentation of the cost of performing the *Work* attributable to the *Change Directive* and shall provide the *Consultant* with copies thereof.

6.3.10 For the purpose of valuing *Change Directives*, the *Owner* shall be afforded reasonable access to all of the *Contractor*'s pertinent documents related to the cost of performing the *Work* attributable to the *Change Directive*.

6.3.11 Pending determination of the final amount of a *Change Directive*, the undisputed value of the *Work* performed as the result of a *Change Directive* is eligible to be included in progress payments.

6.3.12 If the *Owner* and the *Contractor* do not agree on the proposed adjustment in the *Contract Time* attributable to the change in the *Work*, or the method of determining it, the adjustment shall be referred to the *Consultant* for a finding.

6.3.13 When the *Owner* and the *Contractor* reach agreement on the adjustment to the *Contract Price* and to the *Contract Time*, this agreement shall be recorded in a *Change Order*.

GC 6.4 CONCEALED OR UNKNOWN CONDITIONS

6.4.1 If the *Owner* or the *Contractor* discover conditions at the *Place of the Work* which are:

.1 subsurface or otherwise concealed physical conditions which existed before the commencement of the *Work* and differ materially from those indicated in the *Contract Documents*; or

.2 physical conditions, other than conditions due to weather, that are of a nature which differ materially from those ordinarily found to exist and generally recognized as inherent in construction activities of the character provided for in the *Contract Documents*,

then the observing party shall give *Notice in Writing* to the other party of such conditions before they are disturbed and in no event later than 5 *Working Days* after first observance of the conditions.

6.4.2 The *Consultant* will promptly investigate such conditions and make a finding. If the finding is that the conditions differ materially and this would cause an increase or decrease in the *Contractor*'s cost or time to perform the *Work*, the *Owner*, through the *Consultant*, shall issue appropriate instructions for a change in the *Work* as provided in GC 6.2 – CHANGE ORDER or GC 6.3 – CHANGE DIRECTIVE.

6.4.3 If the *Consultant* finds that the conditions at the *Place of the Work* are not materially different or that no change in the *Contract Price* or the *Contract Time* is justified, the *Consultant* will promptly inform the *Owner* and the *Contractor* in writing.

6.4.4 If such concealed or unknown conditions relate to toxic and hazardous substances and materials, artifacts and fossils, or mould, the parties will be governed by the provisions of GC 9.2 – TOXIC AND HAZARDOUS SUBSTANCES, GC 9.3 – ARTIFACTS AND FOSSILS and GC 9.5 – MOULD.

GC 6.5 DELAYS

6.5.1 If the *Contractor* is delayed in the performance of the *Work* by the *Owner*, the *Consultant*, or anyone employed or engaged by them directly or indirectly, contrary to the provisions of the *Contract Documents*, then the *Contract Time* shall be extended for such reasonable time as the *Consultant* may recommend in consultation with the *Contractor*. The *Contractor* shall be reimbursed by the *Owner* for reasonable costs incurred by the *Contractor* as the result of such delay.

6.5.2 If the *Contractor* is delayed in the performance of the *Work* by a stop work order issued by a court or other public authority and providing that such order was not issued as the result of an act or fault of the *Contractor* or any person employed or engaged by the *Contractor* directly or indirectly, resulting in the failure of the *Contractor* to attain *Ready-for-Takeover* by the date stipulated in Article A-1 of the Agreement – THE WORK, then the *Contract Time* shall be extended for such reasonable time as the *Consultant* may recommend in consultation with the *Contractor*. The *Contractor* shall be reimbursed by the *Owner* for reasonable costs incurred by the *Contractor* as the result of such delay.

6.5.3 If the *Contractor* is delayed in the performance of the *Work* by:

.1 labour disputes, strikes, lock-outs (including lock-outs decreed or recommended for its members by a recognized contractors' association, of which the *Contractor* is a member or to which the *Contractor* is otherwise bound),

.2 fire, unusual delay by common carriers or unavoidable casualties,

.3 abnormally adverse weather conditions, or

Note: This contract is protected by copyright. Use of a CCDC 2 document not containing a CCDC 2 copyright seal constitutes an infringement of copyright. Only sign this contract if the document cover page bears a CCDC 2 copyright seal to demonstrate that it is intended by the parties to be an accurate and unamended version of CCDC 2 – 2020 except to the extent that any alterations, additions or modifications are set forth in supplementary conditions.

.4 any cause beyond the *Contractor*'s control other than one resulting from a default or breach of *Contract* by the *Contractor*, then the *Contract Time* shall be extended for such reasonable time as the *Consultant* may recommend in consultation with the *Contractor*. The extension of time shall not be less than the time lost as the result of the event causing the delay, unless the *Contractor* agrees to a shorter extension. The *Contractor* shall not be entitled to payment for costs incurred by such delays unless such delays result from actions by the *Owner*, the *Consultant* or anyone employed or engaged by them directly or indirectly.

6.5.4 No extension shall be made for delay unless *Notice in Writing* of the cause of delay is given to the *Consultant* not later than 10 *Working Days* after the commencement of the delay. In the case of a continuing cause of delay only one *Notice in Writing* shall be necessary.

6.5.5 If no schedule is made under paragraph 2.2.12 of GC 2.2 – ROLE OF THE CONSULTANT, then no request for extension shall be made because of failure of the *Consultant* to furnish instructions until 10 *Working Days* after demand for such instructions has been made.

GC 6.6 CLAIMS FOR A CHANGE IN CONTRACT PRICE

6.6.1 If the *Contractor* intends to make a claim for an increase to the *Contract Price*, or if the *Owner* intends to make a claim against the *Contractor* for a credit to the *Contract Price*, the party that intends to make the claim shall give timely *Notice in Writing* of intent to claim to the other party and to the *Consultant*.

6.6.2 Upon commencement of the event or series of events giving rise to a claim, the party intending to make the claim shall:
.1 take all reasonable measures to mitigate any loss or expense which may be incurred as a result of such event or series of events, and
.2 keep such records as may be necessary to support the claim.

6.6.3 The party making the claim shall submit within a reasonable time to the *Consultant* a detailed account of the amount claimed and the grounds upon which the claim is based and the *Consultant* will make a finding upon such claim.

6.6.4 Where the event or series of events giving rise to the claim has a continuing effect, the detailed account submitted under paragraph 6.6.3 shall be considered to be an interim account and the party making the claim shall, at such intervals as the *Consultant* may reasonably require, submit further interim accounts giving the accumulated amount of the claim and any further grounds upon which it is based. The party making the claim shall submit a final account after the end of the effects resulting from the event or series of events.

6.6.5 The *Consultant's* findings, with respect to a claim made by either party, will be given by *Notice in Writing* to both parties within 30 *Working Days* after receipt of the claim by the *Consultant*, or within such other time period as may be agreed by the parties.

6.6.6 If such finding is not acceptable to either party, the claim shall be settled in accordance with Part 8 of the General Conditions – DISPUTE RESOLUTION.

PART 7 DEFAULT NOTICE

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

7.1.1 If the *Contractor* is adjudged bankrupt, or makes a general assignment for the benefit of creditors because of the *Contractor*'s insolvency, or if a receiver is appointed because of the *Contractor*'s insolvency, the *Owner* may, without prejudice to any other right or remedy the *Owner* may have, terminate the *Contractor*'s right to continue with the *Work*, by giving the *Contractor* or receiver or trustee in bankruptcy *Notice in Writing* to that effect.

7.1.2 If the *Contractor* neglects to perform the *Work* properly or otherwise fails to comply with the requirements of the *Contract* to a substantial degree and if the *Consultant* has given a written statement to the *Owner* and *Contractor* which provides the detail of such neglect to perform the *Work* properly or such failure to comply with the requirements of the *Contract* to a substantial degree, the *Owner* may, without prejudice to any other right or remedy the *Owner* may have, give the *Contractor Notice in Writing*, containing particulars of the default including references to applicable provisions of the *Contract*, that the *Contractor* is in default of the *Contractor*'s contractual obligations and instruct the *Contractor* to correct the default in the 5 *Working Days* immediately following the receipt of such *Notice in Writing*.

7.1.3 If the default cannot be corrected in the 5 *Working Days* specified or in such other time period as may be subsequently agreed in writing by the parties, the *Contractor* shall be in compliance with the *Owner*'s instructions if the *Contractor*:
.1 commences the correction of the default within the specified time,
.2 provides the *Owner* with an acceptable schedule for such correction, and
.3 corrects the default in accordance with the *Contract* terms and with such schedule.

Note: This contract is protected by copyright. Use of a CCDC 2 document not containing a CCDC 2 copyright seal constitutes an infringement of copyright. Only sign this contract if the document cover page bears a CCDC 2 copyright seal to demonstrate that it is intended by the parties to be an accurate and unamended version of CCDC 2 – 2020 except to the extent that any alterations, additions or modifications are set forth in supplementary conditions.

7.1.4 If the *Contractor* fails to correct the default in the time specified or in such other time period as may be subsequently agreed in writing by the parties, without prejudice to any other right or remedy the *Owner* may have, the *Owner* may by giving *Notice in Writing*:
.1 correct such default and deduct the cost thereof from any payment then or thereafter due the *Contractor* for the *Work* provided the *Consultant* has certified such cost to the *Owner* and the *Contractor*, or
.2 terminate the *Contractor*'s right to continue with the *Work* in whole or in part or terminate the *Contract*.

7.1.5 If the *Owner* terminates the *Contractor*'s right to continue with the *Work* as provided in paragraphs 7.1.1 and 7.1.4, the *Owner* shall be entitled to:
.1 take possession of the *Work* and *Products* at the *Place of the Work*; subject to the rights of third parties, utilize the *Construction Equipment* at the *Place of the Work*; finish the *Work* by whatever method the *Owner* may consider expedient, but without undue delay or expense,
.2 withhold further payment to the *Contractor* until a final certificate for payment is issued,
.3 charge the *Contractor* the amount by which the full cost of finishing the *Work* as certified by the *Consultant*, including compensation to the *Consultant* for the *Consultant*'s additional services and a reasonable allowance as determined by the *Consultant* to cover the cost of corrections to work performed by the *Contractor* that may be required under GC 12.3 – WARRANTY, exceeds the unpaid balance of the *Contract Price*; however, if such cost of finishing the *Work* is less than the unpaid balance of the *Contract Price*, the *Owner* shall pay the *Contractor* the difference, and
.4 on expiry of the warranty period, charge the *Contractor* the amount by which the cost of corrections to the *Contractor*'s work under GC 12.3 – WARRANTY exceeds the allowance provided for such corrections, or if the cost of such corrections is less than the allowance, pay the *Contractor* the difference.

7.1.6 The *Contractor*'s obligation under the *Contract* as to quality, correction and warranty of the work performed by the *Contractor* up to the time of termination shall continue in force after such termination of the *Contract*.

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

7.2.1 If the *Owner* is adjudged bankrupt, or makes a general assignment for the benefit of creditors because of the *Owner*'s insolvency, or if a receiver is appointed because of the *Owner*'s insolvency, the *Contractor* may, without prejudice to any other right or remedy the *Contractor* may have, terminate the *Contract* by giving the *Owner* or receiver or trustee in bankruptcy *Notice in Writing* to that effect.

7.2.2 If the *Work* is suspended or otherwise delayed for a period of 20 *Working Days* or more under an order of a court or other public authority and providing that such order was not issued as the result of an act or fault of the *Contractor* or of anyone directly or indirectly employed or engaged by the *Contractor*, the *Contractor* may, without prejudice to any other right or remedy the *Contractor* may have, terminate the *Contract* by giving the *Owner Notice in Writing* to that effect.

7.2.3 The *Contractor* may give *Notice in Writing* to the *Owner*, with a copy to the *Consultant*, that the *Owner* is in default of the *Owner*'s contractual obligations if:
.1 the *Owner* fails to furnish, when so requested by the *Contractor*, reasonable evidence that financial arrangements have been made to fulfill the *Owner*'s obligations under the *Contract*,
.2 the *Consultant* fails to issue a certificate as provided in Part 5 of the General Conditions – PAYMENT,
.3 the *Owner* fails to pay the *Contractor* when due the amounts certified by the *Consultant* or awarded by adjudication, arbitration or court, or
.4 the *Owner* fails to comply with the requirements of the *Contract* to a substantial degree and the *Consultant*, except for GC 5.1 – FINANCING INFORMATION REQUIRED OF THE OWNER, gives a written statement to the *Owner* and the *Contractor* that provides detail of such failure to comply with the requirements of the *Contract* to a substantial degree.

7.2.4 The *Contractor*'s *Notice in Writing* to the *Owner* provided under paragraph 7.2.3 shall advise that if the default is not corrected within 5 *Working Days* following the receipt of the *Notice in Writing*, the *Contractor* may, without prejudice to any other right or remedy the *Contractor* may have, suspend the *Work* or terminate the *Contract*.

7.2.5 If the *Contractor* terminates the *Contract* by giving a *Notice in Writing* to the *Owner* under the conditions set out above, the *Contractor* shall be entitled to be paid for all work performed including reasonable profit, for loss sustained upon *Products* and *Construction Equipment*, and such other damages as the *Contractor* may have sustained as a result of the termination of the *Contract*.

PART 8 DISPUTE RESOLUTION

GC 8.1 AUTHORITY OF THE CONSULTANT

8.1.1 Differences between the parties to the *Contract* as to the interpretation, application or administration of the *Contract* or any failure to agree where agreement between the parties is called for, herein collectively called disputes, which are not resolved

Note: This contract is protected by copyright. Use of a CCDC 2 document not containing a CCDC 2 copyright seal constitutes an infringement of copyright. Only sign this contract if the document cover page bears a CCDC 2 copyright seal to demonstrate that it is intended by the parties to be an accurate and unamended version of CCDC 2 – 2020 except to the extent that any alterations, additions or modifications are set forth in supplementary conditions.

in the first instance by findings of the *Consultant* as provided in GC 2.2 – ROLE OF THE CONSULTANT, shall be settled in accordance with the requirements of Part 8 of the General Conditions – DISPUTE RESOLUTION.

8.1.2 If a dispute arises under the *Contract* in respect of a matter in which the *Consultant* has no authority under the *Contract* to make a finding, the procedures set out in paragraph 8.1.3 and paragraphs 8.3.3 to 8.3.8 of GC 8.3 – NEGOTIATION, MEDIATION AND ARBITRATION, and in GC 8.4 – RETENTION OF RIGHTS apply to that dispute with the necessary changes to detail as may be required.

8.1.3 If a dispute is not resolved promptly, the *Consultant* will give such instructions as in the *Consultant*'s opinion are necessary for the proper performance of the *Work* and to prevent delays pending settlement of the dispute. The parties shall act immediately according to such instructions, it being understood that by so doing neither party will jeopardize any claim the party may have. If it is subsequently determined that such instructions were in error or at variance with the *Contract Documents*, the *Owner* shall pay the *Contractor* costs incurred by the *Contractor* in carrying out such instructions which the *Contractor* was required to do beyond what the *Contract Documents* correctly understood and interpreted would have required, including costs resulting from interruption of the *Work*.

GC 8.2 ADJUDICATION

8.2.1 Nothing in this *Contract* shall be deemed to affect the rights of the parties to resolve any dispute by adjudication as may be prescribed by applicable legislation.

GC 8.3 NEGOTIATION, MEDIATION AND ARBITRATION

8.3.1 In accordance with the rules for mediation as provided in CCDC 40 'Rules for Mediation and Arbitration of Construction Industry Disputes' in effect at the time of bid closing, the parties shall appoint a Project Mediator
.1 within 20 *Working Days* after the *Contract* was awarded, or
.2 if the parties neglected to make an appointment within the 20 *Working Days*, within 10 *Working Days* after either party by *Notice in Writing* requests that the Project Mediator be appointed.

8.3.2 A party shall be conclusively deemed to have accepted a finding of the *Consultant* under GC 2.2 – ROLE OF THE CONSULTANT and to have expressly waived and released the other party from any claims in respect of the particular matter dealt with in that finding unless, within 15 *Working Days* after receipt of that finding, the party sends a *Notice in Writing* of dispute to the other party and to the *Consultant*, which contains the particulars of the matter in dispute and the relevant provisions of the *Contract Documents*. The responding party shall send a *Notice in Writing* of reply to the dispute within 10 *Working Days* after receipt of such *Notice in Writing* setting out particulars of this response and any relevant provisions of the *Contract Documents*.

8.3.3 The parties shall make all reasonable efforts to resolve their dispute by amicable negotiations and agree to provide, without prejudice, frank, candid, and timely disclosure of relevant facts, information and documents to facilitate these negotiations.

8.3.4 After a period of 10 *Working Days* following receipt of a responding party's *Notice in Writing* of reply under paragraph 8.3.2, the parties shall request the Project Mediator to assist the parties to reach agreement on any unresolved dispute. The mediated negotiations shall be conducted in accordance with the rules for mediation as provided in CCDC 40 in effect at the time of bid closing.

8.3.5 If the dispute has not been resolved at the mediation or within such further period as is agreed by the parties, the Project Mediator will terminate the mediated negotiations by giving *Notice in Writing* to the *Owner*, the *Contractor* and the *Consultant*.

8.3.6 By giving a *Notice in Writing* to the other party and the *Consultant*, not later than 10 *Working Days* after the date of termination of the mediated negotiations under paragraph 8.3.5, either party may refer the dispute to be finally resolved by arbitration under the rules of arbitration as provided in CCDC 40 in effect at the time of bid closing. The arbitration shall be conducted in the jurisdiction of the *Place of the Work*.

8.3.7 On expiration of the 10 *Working Days*, the arbitration agreement under paragraph 8.3.6 is not binding on the parties and, if a *Notice in Writing* is not given under paragraph 8.3.6 within the required time, the parties may refer the unresolved dispute to the courts or to any other form of dispute resolution, including arbitration, which they have agreed to use.

8.3.8 If neither party, by *Notice in Writing*, given within 10 *Working Days* of the date of *Notice in Writing* requesting arbitration in paragraph 8.3.6, requires that a dispute be arbitrated immediately, all disputes referred to arbitration as provided in paragraph 8.3.6 shall be:
.1 held in abeyance until:
(1) *Ready-for-Takeover*,
(2) the *Contract* has been terminated, or
(3) the *Contractor* has abandoned the *Work*,
whichever is earlier; and

Note: This contract is protected by copyright. Use of a CCDC 2 document not containing a CCDC 2 copyright seal constitutes an infringement of copyright. Only sign this contract if the document cover page bears a CCDC 2 copyright seal to demonstrate that it is intended by the parties to be an accurate and unamended version of CCDC 2 – 2020 except to the extent that any alterations, additions or modifications are set forth in supplementary conditions.

.2 consolidated into a single arbitration under the rules governing the arbitration under paragraph 8.3.6.

GC 8.4 RETENTION OF RIGHTS

8.4.1 It is agreed that no act by either party shall be construed as a renunciation or waiver of any rights or recourses, provided the party has given the *Notice in Writing* required under Part 8 of the General Conditions – DISPUTE RESOLUTION and has carried out the instructions as provided in paragraph 8.1.3 of GC 8.1 – AUTHORITY OF THE CONSULTANT.

8.4.2 Nothing in Part 8 of the General Conditions – DISPUTE RESOLUTION shall be construed in any way to limit a party from asserting any statutory right to a lien under applicable lien legislation of the jurisdiction of the *Place of the Work* and the assertion of such right by initiating judicial proceedings is not to be construed as a waiver of any right that party may have under paragraph 8.3.6 of GC 8.3 – NEGOTIATION, MEDIATION AND ARBITRATION to proceed by way of arbitration to adjudicate the merits of the claim upon which such a lien is based.

PART 9 PROTECTION OF PERSONS AND PROPERTY

GC 9.1 PROTECTION OF WORK AND PROPERTY

9.1.1 The *Contractor* shall protect the *Work*, the *Owner*'s property and property adjacent to the *Place of the Work* from damage which may arise as the result of the *Contractor*'s operations under the *Contract*, and shall be responsible for such damage, except damage which occurs as the result of:
.1 errors or omissions in the *Contract Documents*; or
.2 acts or omissions by the *Owner*, the *Consultant*, *Other Contractors*, or their agents and employees.

9.1.2 Before commencing any work, the *Contractor* shall determine the location of all underground utilities and structures indicated in the *Contract Documents* or that are reasonably apparent in an inspection of the *Place of the Work*.

9.1.3 Should the *Contractor* in the performance of the *Contract* damage the *Work*, the *Owner*'s property or property adjacent to the *Place of the Work*, the *Contractor* shall be responsible for making good such damage at the *Contractor*'s expense.

9.1.4 Should damage occur to the *Work* or the *Owner*'s property for which the *Contractor* is not responsible, as provided in paragraph 9.1.1, the *Contractor* shall make good such damage to the *Work* and, if the *Owner* so directs, to the *Owner*'s property. The *Contract Price* and *Contract Time* shall be adjusted as provided in GC 6.1 – OWNER'S RIGHT TO MAKE CHANGES, GC 6.2 – CHANGE ORDER and GC 6.3 – CHANGE DIRECTIVE.

GC 9.2 TOXIC AND HAZARDOUS SUBSTANCES

9.2.1 For the purposes of applicable legislation related to toxic and hazardous substances, the *Owner* shall be deemed to have control and management of the *Place of the Work* with respect to existing conditions.

9.2.2 Prior to the *Contractor* commencing the *Work*, the *Owner* shall,
.1 take all reasonable steps to determine whether any toxic or hazardous substances are present at the *Place of the Work*, and
.2 provide the *Consultant* and the *Contractor* with a written list of any such substances that are known to exist and their locations.

9.2.3 The *Owner* shall take all reasonable steps to ensure that no person's exposure to any toxic or hazardous substance exceeds the time weighted levels prescribed by applicable legislation at the *Place of the Work* and that no property is damaged or destroyed as a result of exposure to, or the presence of, toxic or hazardous substances which were at the *Place of the Work* prior to the *Contractor* commencing the *Work*.

9.2.4 Unless the *Contract* expressly provides otherwise, the *Owner* shall be responsible for taking all necessary steps, in accordance with applicable legislation in force at the *Place of the Work*, to dispose of, store or otherwise render harmless any toxic or hazardous substance which was present at the *Place of the Work* prior to the *Contractor* commencing the *Work*.

9.2.5 If the *Contractor*
.1 encounters toxic or hazardous substances at the *Place of the Work*, or
.2 has reasonable grounds to believe that toxic or hazardous substances are present at the *Place of the Work*,
which were not brought to the *Place of the Work* by the *Contractor* or anyone for whom the *Contractor* is responsible and which were not disclosed by the *Owner* or which were disclosed but have not been dealt with as required under paragraph 9.2.4, the *Contractor* shall
.3 take all reasonable steps, including stopping the *Work*, to ensure that no person's exposure to any toxic or hazardous substance exceeds any applicable time weighted levels prescribed by applicable legislation at the *Place of the Work*, and
.4 immediately report the circumstances to the *Consultant* and the *Owner* in writing.

Note: This contract is protected by copyright. Use of a CCDC 2 document not containing a CCDC 2 copyright seal constitutes an infringement of copyright. Only sign this contract if the document cover page bears a CCDC 2 copyright seal to demonstrate that it is intended by the parties to be an accurate and unamended version of CCDC 2 – 2020 except to the extent that any alterations, additions or modifications are set forth in supplementary conditions.

9.2.6 If the *Owner* and the *Contractor* do not agree on the existence, significance of, or whether the toxic or hazardous substances were brought onto the *Place of the Work* by the *Contractor* or anyone for whom the *Contractor* is responsible, the *Owner* shall retain and pay for an independent qualified expert to investigate and determine such matters. The expert's report shall be delivered to the *Owner* and the *Contractor*.

9.2.7 If the *Owner* and the *Contractor* agree or if the expert referred to in paragraph 9.2.6 determines that the toxic or hazardous substances were not brought onto the place of the *Work* by the *Contractor* or anyone for whom the *Contractor* is responsible, the *Owner* shall promptly at the *Owner's* own expense:

.1 take all steps as required under paragraph 9.2.4;
.2 reimburse the *Contractor* for the costs of all steps taken pursuant to paragraph 9.2.5;
.3 extend the *Contract Time* for such reasonable time as the *Consultant* may recommend in consultation with the *Contractor* and the expert referred to in 9.2.6 and reimburse the *Contractor* for reasonable costs incurred as a result of the delay; and
.4 indemnify the *Contractor* as required by GC 13.1 – INDEMNIFICATION.

9.2.8 If the *Owner* and the *Contractor* agree or if the expert referred to in paragraph 9.2.6 determines that the toxic or hazardous substances were brought onto the place of the *Work* by the *Contractor* or anyone for whom the *Contractor* is responsible, the *Contractor* shall promptly at the *Contractor's* own expense:

.1 take all necessary steps, in accordance with applicable legislation in force at the *Place of the Work*, to safely remove and dispose the toxic or hazardous substances;
.2 make good any damage to the *Work*, the *Owner*'s property or property adjacent to the place of the *Work* as provided in paragraph 9.1.3 of GC 9.1 – PROTECTION OF WORK AND PROPERTY;
.3 reimburse the *Owner* for reasonable costs incurred under paragraph 9.2.6; and
.4 indemnify the *Owner* as required by GC 13.1 – INDEMNIFICATION.

9.2.9 If either party does not accept the expert's findings under paragraph 9.2.6, the disagreement shall be settled in accordance with Part 8 of the General Conditions – DISPUTE RESOLUTION. If such disagreement is not resolved promptly, the parties shall act immediately in accordance with the expert's determination and take the steps required by paragraph 9.2.7 or 9.2.8 it being understood that by so doing, neither party will jeopardize any claim that party may have to be reimbursed as provided by GC 9.2 – TOXIC AND HAZARDOUS SUBSTANCES.

GC 9.3 ARTIFACTS AND FOSSILS

9.3.1 Fossils, coins, articles of value or antiquity, structures and other remains or things of scientific or historic interest discovered at the *Place or Work* shall, as between the *Owner* and the *Contractor*, be deemed to be the absolute property of the *Owner*.

9.3.2 The *Contractor* shall take all reasonable precautions to prevent removal or damage to discoveries as identified in paragraph 9.3.1, and shall advise the *Consultant* upon discovery of such items.

9.3.3 The *Consultant* will investigate the impact on the *Work* of the discoveries identified in paragraph 9.3.1. If conditions are found that would cause an increase or decrease in the *Contractor's* cost or time to perform the *Work*, the *Owner*, through the *Consultant*, shall issue appropriate instructions for a change in the *Work* as provided in GC 6.2 – CHANGE ORDER or GC 6.3 – CHANGE DIRECTIVE.

GC 9.4 CONSTRUCTION SAFETY

9.4.1 The *Contractor* shall be responsible for establishing, initiating, maintaining, and supervising all health and safety precautions and programs in connection with the performance of the *Work* in accordance with the applicable health and safety legislation.

9.4.2 The *Owner* and the *Contractor* shall comply with all health and safety precautions and programs established at the *Place of the Work*.

9.4.3 The *Owner* and the *Contractor* shall comply with the rules, regulations and practices required by the applicable health and safety legislation.

9.4.4 The *Owner* shall cause the *Consultant*, *Other Contractors* and the *Owner*'s own forces to comply with all health and safety precautions and programs established by the *Contractor* at the *Place of the Work*.

9.4.5 Nothing in this *Contract* shall affect the determination of liability under the applicable health and safety legislation.

GC 9.5 MOULD

9.5.1 If the *Contractor* or the *Owner* observes or reasonably suspects the presence of mould at the *Place of the Work*, the remediation of which is not expressly part of the *Work*,

.1 the observing party shall promptly report the circumstances to the other party in writing,
.2 the *Contractor* shall promptly take all reasonable steps, including stopping the *Work* if necessary, to ensure that no person suffers injury, sickness or death and that no property is damaged as a result of exposure to or the presence of the mould, and

Note: This contract is protected by copyright. Use of a CCDC 2 document not containing a CCDC 2 copyright seal constitutes an infringement of copyright. Only sign this contract if the document cover page bears a CCDC 2 copyright seal to demonstrate that it is intended by the parties to be an accurate and unamended version of CCDC 2 – 2020 except to the extent that any alterations, additions or modifications are set forth in supplementary conditions.

.3 if the *Owner* and the *Contractor* do not agree on the existence, significance or cause of the mould or as to what steps need be taken to deal with it, the *Owner* shall retain and pay for an independent qualified expert to investigate and determine such matters. The expert's report shall be delivered to the *Owner* and the *Contractor*.

9.5.2 If the *Owner* and the *Contractor* agree, or if the expert referred to in paragraph 9.5.1.3 determines that the presence of mould was caused by the *Contractor*'s operations under the *Contract*, the *Contractor* shall promptly, at the *Contractor*'s own expense:
.1 take all reasonable and necessary steps to safely remediate or dispose of the mould,
.2 make good any damage to the *Work*, the *Owner*'s property or property adjacent to the *Place of the Work* as provided in paragraph 9.1.3 of GC 9.1 – PROTECTION OF WORK AND PROPERTY,
.3 reimburse the *Owner* for reasonable costs incurred under paragraph 9.5.1.3, and
.4 indemnify the *Owner* as required by GC 13.1 – INDEMNIFICATION.

9.5.3 If the *Owner* and the *Contractor* agree, or if the expert referred to in paragraph 9.5.1.3 determines that the presence of mould was not caused by the *Contractor*'s operations under the *Contract*, the *Owner* shall promptly, at the *Owner*'s own expense:
.1 take all reasonable and necessary steps to safely remediate or dispose of the mould,
.2 reimburse the *Contractor* for the cost of taking the steps under paragraph 9.5.1.2 and making good any damage to the *Work* as provided in paragraph 9.1.4 of GC 9.1 – PROTECTION OF WORK AND PROPERTY,
.3 extend the *Contract Time* for such reasonable time as the *Consultant* may recommend in consultation with the *Contractor* and the expert referred to in paragraph 9.5.1.3 and reimburse the *Contractor* for reasonable costs incurred as a result of the delay, and
.4 indemnify the *Contractor* as required by GC 13.1 – INDEMNIFICATION.

9.5.4 If either party does not accept the expert's finding under paragraph 9.5.1.3, the disagreement shall be settled in accordance with Part 8 of the General Conditions – DISPUTE RESOLUTION. If such disagreement is not resolved promptly, the parties shall act immediately in accordance with the expert's determination and take the steps required by paragraphs 9.5.2 or 9.5.3, it being understood that by so doing neither party will jeopardize any claim the party may have to be reimbursed as provided by GC 9.5 – MOULD.

PART 10 GOVERNING REGULATIONS

GC 10.1 TAXES AND DUTIES

10.1.1 The *Contract Price* shall include all taxes and customs duties in effect at the time of the bid closing except for *Value Added Taxes* payable by the *Owner* to the *Contractor* as stipulated in Article A-4 of the Agreement – CONTRACT PRICE.

10.1.2 Any increase or decrease in costs to the *Contractor* due to changes in taxes and duties after the time of the bid closing shall increase or decrease the *Contract Price* accordingly.

GC 10.2 LAWS, NOTICES, PERMITS, AND FEES

10.2.1 The laws of the *Place of the Work* shall govern the *Work*.

10.2.2 The *Owner* shall obtain and pay for development approvals, building permit, permanent easements, rights of servitude, and all other necessary approvals and permits, except for the permits and fees referred to in paragraph 10.2.3 or for which the *Contract Documents* specify as the responsibility of the *Contractor*.

10.2.3 The *Contractor* shall be responsible for the procurement of permits, licences, inspections, and certificates, which are necessary for the performance of the *Work* and customarily obtained by contractors in the jurisdiction of the *Place of the Work* after the issuance of the building permit. The *Contract Price* includes the cost of these permits, licences, inspections, and certificates, and their procurement.

10.2.4 The *Contractor* shall give the required notices and comply with the laws, ordinances, rules, regulations, or codes which are or become in force during the performance of the *Work* and which relate to the *Work*, to the preservation of the public health, and to construction safety.

10.2.5 The *Contractor* shall not be responsible for verifying that the *Contract Documents* are in compliance with the applicable laws, ordinances, rules, regulations, or codes relating to the *Work*. If the *Contract Documents* are at variance therewith, or if, subsequent to the time of bid closing, changes are made to the applicable laws, ordinances, rules, regulations, or codes which require modification to the *Contract Documents*, the *Contractor* shall advise the *Consultant* in writing requesting direction immediately upon such variance or change becoming known. The *Consultant* will issue the changes required to the *Contract Documents* as provided in GC 6.1 – OWNER'S RIGHT TO MAKE CHANGES, GC 6.2 – CHANGE ORDER and GC 6.3 – CHANGE DIRECTIVE.

Note: This contract is protected by copyright. Use of a CCDC 2 document not containing a CCDC 2 copyright seal constitutes an infringement of copyright. Only sign this contract if the document cover page bears a CCDC 2 copyright seal to demonstrate that it is intended by the parties to be an accurate and unamended version of CCDC 2 – 2020 except to the extent that any alterations, additions or modifications are set forth in supplementary conditions.

10.2.6 If the *Contractor* fails to advise the *Consultant* in writing; fails to obtain direction as required in paragraph 10.2.5; and performs work knowing it to be contrary to any laws, ordinances, rules, regulations, or codes; the *Contractor* shall be responsible for and shall correct the violations thereof; and shall bear the costs, expenses and damages attributable to the failure to comply with the provisions of such laws, ordinances, rules, regulations, or codes.

10.2.7 If, subsequent to the time of bid closing, changes are made to applicable laws, ordinances, rules, regulations, or codes of authorities having jurisdiction which affect the cost of the *Work*, either party may submit a claim in accordance with the requirements of GC 6.6 – CLAIMS FOR A CHANGE IN CONTRACT PRICE.

GC 10.3 PATENT FEES

10.3.1 The *Contractor* shall pay the royalties and patent licence fees required for the performance of the *Contract*. The *Contractor* shall hold the *Owner* harmless from and against claims, demands, losses, costs, damages, actions, suits, or proceedings arising out of the *Contractor*'s performance of the *Contract* which are attributable to an infringement or an alleged infringement of a patent of invention by the *Contractor* or anyone for whose acts the *Contractor* may be liable.

10.3.2 The *Owner* shall hold the *Contractor* harmless against claims, demands, losses, costs, damages, actions, suits, or proceedings arising out of the *Contractor*'s performance of the *Contract* which are attributable to an infringement or an alleged infringement of a patent of invention in executing anything for the purpose of the *Contract*, the physical model, plan or design of which was supplied to the *Contractor* as part of the *Contract*.

GC 10.4 WORKERS' COMPENSATION

10.4.1 Prior to commencing the *Work*, and again with the *Contractor*'s applications for payment, the *Contractor* shall provide evidence of compliance with workers' compensation legislation at the *Place of the Work*.

PART 11 INSURANCE

GC 11.1 INSURANCE

11.1.1 Without restricting the generality of GC 13.1 – INDEMNIFICATION, the *Contractor* shall provide, maintain and pay for the following insurance coverages, the requirements of which are specified in CCDC 41 'CCDC Insurance Requirements' in effect at the time of bid closing except as hereinafter provided:

.1 General liability insurance in the name of the *Contractor* and include, or in the case of a single, blanket policy, be endorsed to name, the *Owner* and the *Consultant* as insureds but only with respect to liability, other than legal liability arising out of their sole negligence, arising out of the operations of the *Contractor* with regard to the *Work*. General liability insurance shall be maintained from the date of commencement of the *Work* until one year from the date of *Ready-for-Takeover*. Liability coverage shall be provided for completed operations hazards from the date of *Ready-for-Takeover* on an ongoing basis for a period of 6 years following *Ready-for-Takeover*.

.2 Automobile Liability Insurance from the date of commencement of the *Work* until one year after the date of *Ready-for-Takeover*.

.3 Unmanned aerial vehicle aircraft, manned aircraft or watercraft Liability Insurance when owned or non-owned manned or unmanned aircraft or watercraft are used directly or indirectly in the performance of the *Work*.

.4 "Broad form" property insurance in the joint names of the *Contractor*, the *Owner* and the *Consultant*. The policy shall include as insureds all *Subcontractors*. The "Broad form" property insurance shall be provided from the date of commencement of the *Work* until the earliest of:

(1) 10 calendar days after the date of *Ready-for-Takeover*;

(2) on the commencement of use or occupancy of any part or section of the *Work* unless such use or occupancy is for construction purposes, habitational, office, banking, convenience store under 465 square metres in area, or parking purposes, or for the installation, testing and commissioning of equipment forming part of the *Work*; and

(3) when left unattended for more than 30 consecutive calendar days or when construction activity has ceased for more than 30 consecutive calendar days.

.5 Boiler and machinery insurance in the joint names of the *Contractor*, the *Owner* and the *Consultant*. The policy shall include as insureds all *Subcontractors*. The coverage shall be maintained continuously from commencement of use or operation of the boiler and machinery objects insured by the policy and until 10 calendar days after the date of *Ready-for-Takeover*.

.6 The "Broad form" property and boiler and machinery policies shall provide that, in the case of a loss or damage, payment shall be made to the *Owner* and the *Contractor* as their respective interests may appear. In the event of loss or damage:

(1) the *Contractor* shall act on behalf of the *Owner* for the purpose of adjusting the amount of such loss or damage payment with the insurers. When the extent of the loss or damage is determined, the *Contractor* shall proceed to restore the *Work*. Loss or damage shall not affect the rights and obligations of either party under the *Contract* except

Note: This contract is protected by copyright. Use of a CCDC 2 document not containing a CCDC 2 copyright seal constitutes an infringement of copyright. Only sign this contract if the document cover page bears a CCDC 2 copyright seal to demonstrate that it is intended by the parties to be an accurate and unamended version of CCDC 2 – 2020 except to the extent that any alterations, additions or modifications are set forth in supplementary conditions.

that the *Contractor* shall be entitled to such reasonable extension of *Contract Time* relative to the extent of the loss or damage as the *Consultant* may recommend in consultation with the *Contractor*;

(2) the *Contractor* shall be entitled to receive from the *Owner*, in addition to the amount due under the *Contract*, the amount which the *Owner*'s interest in restoration of the *Work* has been appraised, such amount to be paid as the restoration of the *Work* proceeds in accordance with the progress payment provisions. In addition the *Contractor* shall be entitled to receive from the payments made by the insurer the amount of the *Contractor*'s interest in the restoration of the *Work*; and

(3) to the *Work* arising from the work of the *Owner*, the *Owner*'s own forces or *Other Contractors*, the *Owner* shall, in accordance with the *Owner*'s obligations under the provisions relating to construction by the *Owner* or *Other Contractors*, pay the *Contractor* the cost of restoring the *Work* as the restoration of the *Work* proceeds and as in accordance with the progress payment provisions.

.7 Contractors' Equipment Insurance from the date of commencement of the *Work* until one year after the date of *Ready-for-Takeover*.

.8 Contractors' Pollution Liability Insurance from the date of commencement of the *Work* until one year after the date of *Ready-for-Takeover*.

11.1.2 Prior to commencement of the *Work* and upon the placement, renewal, amendment, or extension of all or any part of the insurance, the *Contractor* shall promptly provide the *Owner* with confirmation of coverage and, if required, a certified true copy of the policies certified by an authorized representative of the insurer together with copies of any amending endorsements applicable to the *Work*.

11.1.3 The parties shall pay their share of the deductible amounts in direct proportion to their responsibility in regards to any loss for which the above policies are required to pay, except where such amounts may be excluded by the terms of the *Contract*.

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

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

11.1.6 If a revised version of CCDC 41 is published, which specifies reduced insurance requirements, the parties shall address such reduction, prior to the *Contractor*'s insurance policy becoming due for renewal, and record any agreement in a *Change Order*.

11.1.7 If a revised version of CCDC 41 is published, which specifies increased insurance requirements, the *Owner* may request the increased coverage from the *Contractor* by way of a *Change Order*.

11.1.8 A *Change Directive* shall not be used to direct a change in the insurance requirements in response to the revision of CCDC 41.

PART 12 OWNER TAKEOVER

GC 12.1 READY-FOR-TAKEOVER

12.1.1 The prerequisites to attaining *Ready-for-Takeover* of the *Work* are limited to the following:

.1 The *Consultant* has certified or verified the *Substantial Performance of the Work*.

.2 Evidence of compliance with the requirements for occupancy or occupancy permit as prescribed by the authorities having jurisdiction.

.3 Final cleaning and waste removal at the time of applying for *Ready-for-Takeover*, as required by the *Contract Documents*.

.4 The delivery to the *Owner* of such operations and maintenance documents reasonably necessary for immediate operation and maintenance, as required by the *Contract Documents*.

.5 Make available a copy of the as-built drawings completed to date on site.

.6 Startup, testing required for immediate occupancy, as required by the *Contract Documents*.

.7 Ability to secure access to the *Work* has been provided to the *Owner*, if required by the *Contract Documents*.

.8 Demonstration and training, as required by the *Contract Documents*, is scheduled by the *Contractor* acting reasonably.

12.1.2 If any prerequisites set forth in paragraphs 12.1.1.3 to 12.1.1.6 must be deferred because of conditions reasonably beyond the control of the *Contractor*, or by agreement between the *Owner* and the *Contractor* to do so, *Ready-for-Takeover* shall not be delayed.

12.1.3 When the *Contractor* considers that the *Work* is *Ready-for-Takeover*, the *Contractor* shall deliver to the *Consultant* and to the *Owner* a comprehensive list of items to be completed or corrected, together with a written application for *Ready-for-Takeover* for review. Failure to include an item on the list does not alter the responsibility of the *Contractor* to complete the *Contract*.

12.1.4 The *Consultant* will review the *Work* to verify the validity of the application and will promptly, and in any event, no later than 10 calendar days after receipt of the *Contractor*'s list and application:

Note: This contract is protected by copyright. Use of a CCDC 2 document not containing a CCDC 2 copyright seal constitutes an infringement of copyright. Only sign this contract if the document cover page bears a CCDC 2 copyright seal to demonstrate that it is intended by the parties to be an accurate and unamended version of CCDC 2 – 2020 except to the extent that any alterations, additions or modifications are set forth in supplementary conditions.

.1 advise the *Contractor* in writing that the *Work* is not *Ready-for-Takeover* and give reasons why, or
.2 confirm the date of *Ready-for-Takeover* in writing to each of the *Owner* and the *Contractor*.

12.1.5 Immediately following the confirmation of the date of *Ready-for-Takeover*, the *Contractor*, in consultation with the *Consultant*, shall establish a reasonable date for finishing the *Work*.

12.1.6 The provision of GC 12.1 – READY-FOR-TAKEOVER shall be subject to GC 12.2 – EARLY OCCUPANCY BY THE OWNER.

GC 12.2 EARLY OCCUPANCY BY THE OWNER

12.2.1 The *Owner* may take occupancy of a part or the entirety of the *Work* before *Ready-for-Takeover* has been attained only as agreed by the *Contractor* which agreement shall not be unreasonably withheld.

12.2.2 The *Owner* shall not occupy a part or the entirety of the *Work* without prior approval by authorities having jurisdiction.

12.2.3 If the *Owner* takes occupancy of a part of the *Work* before *Ready-for-Takeover* has been attained:
.1 The part of the *Work* which is occupied shall be deemed to have been taken over by the *Owner* as from the date on which it is occupied.
.2 The *Contractor* shall cease to be liable for the care of such part as from this date, when responsibility shall pass to the *Owner*.
.3 The warranty period specified in paragraph 12.3.1 of GC 12.3 – WARRANTY for that part of the *Work* shall start from the date on which it is occupied.

12.2.4 If the *Owner* takes occupancy of the entirety of the *Work* before all the prerequisites are met as described in paragraph 12.1.1 of GC 12.1 – READY-FOR-TAKEOVER, the *Work* shall, subject to the requirements of the applicable lien legislation, be deemed to achieve *Ready-for-Takeover*. This shall not relieve the *Contractor*'s responsibility to complete the *Work* in a timely manner.

GC 12.3 WARRANTY

12.3.1 Except for extended warranties as described in paragraph 12.3.6, the warranty period under the *Contract* is one year from the date when *Ready-for-Takeover* has been attained.

12.3.2 The *Contractor* shall be responsible for the proper performance of the *Work* to the extent that the design and *Contract Documents* permit such performance.

12.3.3 The *Owner*, through the *Consultant*, shall promptly give the *Contractor Notice in Writing* of observed defects and deficiencies which occur during the one year warranty period.

12.3.4 Subject to paragraph 12.3.2, the *Contractor* shall correct promptly, at the *Contractor*'s expense, defects or deficiencies in the *Work* which appear prior to and during the one year warranty period.

12.3.5 The *Contractor* shall correct or pay for damage resulting from corrections made under the requirements of paragraph 12.3.4.

12.3.6 Any extended warranties required beyond the one year warranty period as described in paragraph 12.3.1, shall be as specified in the *Contract Documents*. Extended warranties shall be issued by the warrantor to the benefit of the *Owner*. The *Contractor*'s responsibility with respect to extended warranties shall be limited to obtaining any such extended warranties from the warrantor. The obligations under such extended warranties are solely the responsibilities of the warrantor.

PART 13 INDEMNIFICATION AND WAIVER

GC 13.1 INDEMNIFICATION

13.1.1 Without restricting the parties' obligation to indemnify respecting toxic and hazardous substances, patent fees and defect in title claims all as described in paragraphs 13.1.4 and 13.1.5, the *Owner* and the *Contractor* shall each indemnify and hold harmless the other from and against all claims, demands, losses, costs, damages, actions, suits, or proceedings whether in respect to losses suffered by them or in respect to claims by third parties that arise out of, or are attributable in any respect to their involvement as parties to this *Contract*, provided such claims are:
.1 caused by:
(1) the negligent acts or omissions of the party from whom indemnification is sought or anyone for whose negligent acts or omissions that party is liable, or
(2) a failure of the party to the *Contract* from whom indemnification is sought to fulfill its terms or conditions; and
.2 made by *Notice in Writing* within a period of 6 years from the *Ready-for-Takeover* date or within such shorter period as may be prescribed by any limitation statute of the Province or Territory of the *Place of the Work*.

The parties expressly waive the right to indemnity for claims other than those provided for in this *Contract*.

Note: This contract is protected by copyright. Use of a CCDC 2 document not containing a CCDC 2 copyright seal constitutes an infringement of copyright. Only sign this contract if the document cover page bears a CCDC 2 copyright seal to demonstrate that it is intended by the parties to be an accurate and unamended version of CCDC 2 – 2020 except to the extent that any alterations, additions or modifications are set forth in supplementary conditions.

13.1.2 The obligation of either party to indemnify as set forth in paragraph 13.1.1 shall be limited as follows:
.1 In respect to losses suffered by the *Owner* and the *Contractor* for which insurance is to be provided by either party pursuant to GC 11.1 – INSURANCE, the minimum liability insurance limit for one occurrence, of the applicable insurance policy, as referred to in CCDC 41 in effect at the time of bid closing.
.2 In respect to losses suffered by the *Owner* and the *Contractor* for which insurance is not required to be provided by either party in accordance with GC 11.1 – INSURANCE, the greater of the *Contract Price* as recorded in Article A-4 – CONTRACT PRICE or $2,000,000, but in no event shall the sum be greater than $20,000,000.
.3 In respect to indemnification by a party against the other with respect to losses suffered by them, such obligation shall be restricted to direct loss and damage, and neither party shall have any liability to the other for indirect, consequential, punitive or exemplary damages.
.4 In respect to indemnification respecting claims by third parties, the obligation to indemnify is without limit.

13.1.3 The obligation of either party to indemnify the other as set forth in paragraphs 13.1.1 and 13.1.2 shall be inclusive of interest and all legal costs.

13.1.4 The *Owner* and the *Contractor* shall indemnify and hold harmless the other from and against all claims, demands, losses, costs, damages, actions, suits, or proceedings arising out of their obligations described in GC 9.2 – TOXIC AND HAZARDOUS SUBSTANCES.

13.1.5 The *Owner* shall indemnify and hold harmless the *Contractor* from and against all claims, demands, losses, costs, damages, actions, suits, or proceedings:
.1 as described in paragraph 10.3.2 of GC 10.3 – PATENT FEES, and
.2 arising out of the *Contractor*'s performance of the *Contract* which are attributable to a lack of or defect in title or an alleged lack of or defect in title to the *Place of the Work*.

13.1.6 In respect to any claim for indemnity or to be held harmless by the *Owner* or the *Contractor*:
.1 *Notice in Writing* of such claim shall be given within a reasonable time after the facts upon which such claim is based become known; and
.2 should any party be required as a result of its obligation to indemnify another to pay or satisfy a final order, judgment or award made against the party entitled by this contract to be indemnified, then the indemnifying party upon assuming all liability for any costs that might result shall have the right to appeal in the name of the party against whom such final order or judgment has been made until such rights of appeal have been exhausted.

GC 13.2 WAIVER OF CLAIMS

13.2.1 Subject to any lien legislation applicable to the *Place of the Work*, the *Contractor* waives and releases the *Owner* from all claims which the *Contractor* has or reasonably ought to have knowledge of that could be advanced by the *Contractor* against the *Owner* under the *Contract*, including, without limitation, those arising from negligence or breach of contract in respect to which the cause of action is based upon acts or omissions which occurred prior to or on the *Ready-for-Takeover* date, except as follows:
.1 claims arising prior to or on the *Ready-for-Takeover* date for which *Notice in Writing* of claim has been received by the *Owner* from the *Contractor* no later than 5 calendar days before the expiry of the lien period provided by the lien legislation applicable at the *Place of the Work* or 20 calendar days following the *Ready-for-Takeover* date, whichever is later;
.2 indemnification for claims advanced against the *Contractor* by third parties for which a right of indemnification may be asserted by the *Contractor* against the *Owner* pursuant to the provisions of this *Contract*;
.3 claims respecting toxic and hazardous substances, patent fees and defect in title matters for which a right of indemnity could be asserted by the *Contractor* pursuant to the provisions of paragraphs 13.1.4 or 13.1.5 of GC 13.1 – INDEMNIFICATION; and
.4 claims resulting from acts or omissions which occur after the *Ready-for-Takeover* date.

13.2.2 The *Contractor* waives and releases the *Owner* from all claims resulting from acts or omissions which occurred after the *Ready-for-Takeover* date except for:
.1 indemnification respecting third party claims, and claims respecting toxic and hazardous substances, patent fees and defect in title matters, all as referred in paragraphs 13.2.1.2 and 13.2.1.3; and
.2 claims for which *Notice in Writing* of claim has been received by the *Owner* from the *Contractor* within 395 calendar days following the *Ready-for-Takeover* date.

13.2.3 Subject to any lien legislation applicable to the *Place of the Work*, the *Owner* waives and releases the *Contractor* from all claims which the *Owner* has or reasonably ought to have knowledge of that could be advanced by the *Owner* against the *Contractor* under the *Contract*, including, without limitation, those arising from negligence or breach of contract in respect to which the cause of action is based upon acts or omissions which occurred prior to or on the *Ready-for-Takeover* date, except as follows:
.1 claims arising prior to or on the *Ready-for-Takeover* date for which *Notice in Writing* of claim has been received by the *Contractor* from the *Owner* no later than 20 calendar days following the *Ready-for-Takeover* date;

Note: This contract is protected by copyright. Use of a CCDC 2 document not containing a CCDC 2 copyright seal constitutes an infringement of copyright. Only sign this contract if the document cover page bears a CCDC 2 copyright seal to demonstrate that it is intended by the parties to be an accurate and unamended version of CCDC 2 – 2020 except to the extent that any alterations, additions or modifications are set forth in supplementary conditions.

.2 indemnification for claims advanced against the *Owner* by third parties for which a right of indemnification may be asserted by the *Owner* against the *Contractor* pursuant to the provisions of this *Contract*;
.3 claims respecting toxic and hazardous substances for which a right of indemnity could be asserted by the *Owner* against the *Contractor* pursuant to the provisions of paragraph 13.1.4 of GC 13.1 – INDEMNIFICATION;
.4 damages arising from the *Contractor*'s actions which result in substantial defects or deficiencies in the *Work*. "Substantial defects or deficiencies" mean those defects or deficiencies in the *Work* which affect the *Work* to such an extent or in such a manner that a significant part or the whole of the *Work* is unfit for the purpose intended by the *Contract Documents*;
.5 claims arising pursuant to GC 12.3 – WARRANTY; and
.6 claims arising from acts or omissions which occur after the *Ready-for-Takeover* date.

13.2.4 Respecting claims arising upon substantial defects and deficiencies in the *Work*, as referenced in paragraph 13.2.3.4, and notwithstanding paragraph 13.2.3.5, the *Owner* waives and releases the *Contractor* from all claims except claims for which *Notice in Writing* of claim has been received by the *Contractor* from the *Owner* within a period of six years from the *Ready-for-Takeover* date, provided that any limitation statute of the Province or Territory of the *Place of the Work* permit such agreement. If the applicable limitation statute does not permit such agreement, the time within which any such claim may be brought shall be such shorter period as may be prescribed by any limitation statute of the Province or Territory of the *Place of the Work*.

13.2.5 The *Owner* waives and releases the *Contractor* from all claims arising from acts or omissions which occur after the *Ready-for-Takeover* date, except for:
.1 indemnification for claims advanced against the *Owner* by third parties, as referenced in paragraph 13.2.3.2;
.2 claims respecting toxic and hazardous substances for which a right of indemnity could be asserted by the *Owner* against the *Contractor*, as referenced in paragraph 13.2.3.3;
.3 claims arising under GC 12.3 – WARRANTY; and
.4 claims for which *Notice is Writing* has been received by the *Contractor* from the *Owner* within 395 calendar days following the *Ready-for-Takeover* date.

13.2.6 "*Notice in Writing* of claim" as provided for in GC 13.2 – WAIVER OF CLAIMS to preserve a claim or right of action which would otherwise, by the provisions of GC 13.2 – WAIVER OF CLAIMS, be deemed to be waived, must include the following:
.1 a clear and unequivocal statement of an intention to claim;
.2 a statement as to the nature of the claim and the grounds upon which the claim is based; and
.3 a statement of the estimated quantum of the claim.

13.2.7 A claim for lien asserted under the lien legislation prevailing at the *Place of the Work* shall qualify as notice of claim for the purposes of this *Contract*.

13.2.8 The party giving the *Notice in Writing* of claim as provided for in GC 13.2 – WAIVER OF CLAIMS shall submit within a reasonable time a detailed account of the amount claimed.

13.2.9 Where the event or series of events giving rise to a claim made under paragraphs 13.2.1 or 13.2.3 has a continuing effect, the detailed account submitted under paragraph 13.2.8 shall be considered to be an interim account and the party making the claim shall submit further interim accounts, at reasonable intervals, giving the accumulated amount of the claim and any further grounds upon which such claim is based. The party making the claim shall submit a final account after the end of the effects resulting from the event or series of events.

13.2.10 Nothing in GC 13.2 – WAIVER OF CLAIMS shall be deemed to affect the rights of the parties under any lien legislation or limitations legislation prevailing at the *Place of the Work*.

Note: This contract is protected by copyright. Use of a CCDC 2 document not containing a CCDC 2 copyright seal constitutes an infringement of copyright. Only sign this contract if the document cover page bears a CCDC 2 copyright seal to demonstrate that it is intended by the parties to be an accurate and unamended version of CCDC 2 – 2020 except to the extent that any alterations, additions or modifications are set forth in supplementary conditions.

ATTACHMENT “D” – SUPPLEMENTARY CONDITIONS
STANDARD CONSTRUCTION DOCUMENT – CCDC 2 - 2020

SUPPLEMENTARY CONDITIONS
STANDARD CONSTRUCTION DOCUMENT – CCDC 2 – 2020

Contents

AGREEMENT BETWEEN OWNER AND CONTRACTOR

ARTICLE A-1 THE WORK

SC-1 Delete paragraph 1.3 of Article A-1 and replace it with the following:

"commence the *Work* by the date stipulated by the *Owner* in the *Notice of Award* and, subject to adjustment in *Contract Time* as provided for in the *Contract Documents*, attain *Ready-for-Takeover* and *Completion* in accordance with the *Agreement Term Sheet*."

SC-2 Add the following new paragraphs 1.4 and 1.5 to Article A-1:

"1.4 The *Contractor* shall diligently perform and complete the *Work* in accordance with the *Standard of Care*, all *Applicable Laws* and all terms and conditions of the *Contract Documents*, including the *Construction Schedule*.

1.5 The *Contractor* represents that in entering into the *Contract* with the *Owner* for the performance of the *Work*, it has either in accordance with the *Standard of Care* inspected the *Place of the Work* and reviewed for itself all information provided by the *Owner*, the character of the *Work* to be done, and all local conditions, including the position of all registered easements, pole lines, conduits, watermains, sewers and other underground and overground utilities and structures, or that, not having so inspected and reviewed, the *Contractor* has assumed and does hereby assume all risk of conditions now existing or arising in the course of the *Work* that might or could make the *Work*, or any items thereof, more expensive in character, or more onerous to fulfil than was contemplated or known as of the *Effective Date*. For certainty, the *Contractor* shall not be liable for conditions which would not have been ascertainable by a diligent review of the *Place of the Work*, all information provided by the *Owner*, the character of the *Work* to be done, and all local conditions in accordance with the *Standard of Care* prior to the *Effective Date*."

ARTICLE A-4 CONTRACT PRICE

SC-3 Add new paragraphs 4.6 and 4.7 to Article A-4 as follows:

"4.6 To secure performance of the *Contractor*'s warranty obligations the *Owner* shall retain from each *Proper Invoice* an amount equal to the percentage of the total amount claimed for payment in such *Proper Invoice* (exclusive of *Value Added Taxes*) as stipulated in the *Agreement Term Sheet* (the "***Warranty Security***").

4.7 For the purposes of paragraph 6.5.7, if the *Contractor* fails to achieve *Ready-for-Takeover* by the *Ready-for-Takeover Date* then the *Contractor* shall be liable to the *Owner* for liquidated damages in the amount per day stipulated in the *Agreement Term Sheet* for each day or part day of delay until *Ready-for-Takeover* is achieved."

ARTICLE A-5 PAYMENT

SC-4 Delete paragraphs 5.1 and 5.2 of Article A-5 in its entirety and replace it with the following:

"5.1 Subject to the provisions of the *Contract Documents* and *Payment Legislation*, including in accordance with statutory regulations respecting holdback percentages, the *Owner* shall:

.1 make progress payments to the *Contractor* on account of the *Contract Price* (excluding the *Warranty Security*) when due together with such *Value Added Taxes* as may be applicable to such payments,

.2 upon *Substantial Performance of the Work*, pay to the *Contractor* the unpaid balance of the holdback amount when due together with such *Value Added Taxes* as may be applicable to such payment,

.3 upon *Completion*, pay to the *Contractor* the unpaid balance of the *Contract Price* (excluding the *Warranty Security* and any unauthorized cash allowances, contingencies and provisional items) when due together with such *Value Added Taxes* as may be applicable to such payment, and

.4 upon the issuance of the *Proper Invoice* for payment of the *Warranty Security* (less any deductions to such security applied in accordance with this *Contract*) following satisfaction of all requirements set out in paragraph 12.3.8, pay the *Warranty Security* when due together with such *Value Added Taxes* as may be applicable to such payment.

For certainty, all payments made by the *Owner* pursuant to subparagraphs 5.1.1, 5.1.2 and 5.1.3 shall be exclusive of the *Warranty Security*, which amount shall be paid as a milestone payment in accordance with subparagraph 5.1.4.

5.2 Should either party fail to make payments as they become due under the terms of the *Contract* or in an award by adjudication, arbitration or court, interest shall also become due and payable at the rates stipulated in the *Payment Legislation*."

ARTICLE A-6 RECEIPT AND ADDRESSES FOR NOTICES IN WRITING

SC-5 Delete paragraph 6.5 of Article A-6 in its entirety and replace it with the following:

"6.5 Contact information for a party may be changed by *Notice in Writing* to the other party setting out the new contact information in accordance with this Article A-6."

ARTICLE A-9 RELATIONSHIP OF THE PARTIES

ARTICLE A-10 PANDEMIC

ARTICLE A-11 INTERPRETATION AND OTHER MATTERS

SC-6 Add new Articles A-9, A-10 and A-11 as follows:

"**ARTICLE A-9 RELATIONSHIP OF THE PARTIES**

9.1 The *Contractor* shall be an independent contractor in performing its obligations under the *Contract*. The *Contract* does not create any agency, partnership, joint venture, fiduciary or other relationship of the *Contractor* with the *Owner* other than the relationship of independent contractor.

9.2 No inspection, review, comment, approval, verification, confirmation, certification, acknowledgement or audit pursuant to the provisions of the *Contract* by any *Owner Personnel*, nor any failure of any of them to do so, shall relieve the *Contractor* from performing or fulfilling any of its obligations under the *Contract* or be construed as an acceptance of the *Work* or any part thereof."

ARTICLE A-10 PANDEMIC

10.1 The parties acknowledge and agree that as of the *Effective Date*:

.1 the *Pandemic* is on-going and, as a result, *Governmental Authorities*, including the Government of Canada, the Province of Ontario, The Regional Municipality of Halton and the *Municipality*, have implemented *Governmental Responses*; and

.2 it is uncertain how long the *Pandemic* and the related *Governmental Responses* will continue and whether there may be a resurgence of *COVID-19* resulting in a *Pandemic Change in Law*.

10.2 Except as expressly provided in this *Contract*, each party shall be solely responsible for costs and expenses incurred in performance of its obligations under the *Contract* related to or arising from the *Pandemic* and compliance with *Governmental Responses*, including in respect of the contraction by or infection of *Contractor Personnel* and *Owner Personnel*, as applicable, with *COVID-19* and neither party assumes responsibility whatsoever with respect to any such loss suffered by the other.

10.3 In addition to any *Governmental Responses*, the *Contractor* shall comply with any other *Pandemic*-related protocols and guidelines pertaining to the *Work* or *Place of the Work* that may be communicated to the *Contractor* by the *Owner* in writing.

10.4 Notwithstanding any other term of this Contract, the *Owner* and *Contractor* acknowledge and agree that under no circumstance shall any *Contractor Personnel* be obligated to provide or disclose the personal information of any *Contractor Personnel* to the *Owner* or any other third party.

10.5 The *Contractor* expressly acknowledges and agrees that the *Contract Price* and *Contract Time* account for and are inclusive of all costs and impacts to the *Work* resultant or arising from *COVID-19*, any *Governmental Response* and the *Pandemic* to the extent such costs and impacts were known as of the *Effective Date*. For certainty, the *Contractor* acknowledges and agrees that the following impacts of *COVID-19*, the *Pandemic* and *Governmental Responses* to performance of the *Work* were known as of the *Effective Date* and, accordingly, are fully accounted for in the *Contract Price* and *Contract Time*:

.1 the best practices recommended by the Ontario Ministry of Labour for construction site health and safety during the *Pandemic* in effect at the date of the *Contract*;

.2 the need to implement physical distancing;

.3 the obligation to monitor workers, personnel and visitors to the *Place of the Work* for illness or *COVID-19* symptoms;

.4 the potential for loss of *Contractor Personnel* due to illness, *COVID-19* symptoms or exposure to Persons with same;

.5 the need to implement procedures for timely reporting (including to the *Owner*) of any illness or *COVID-19* symptoms experienced by workers, personnel or visitors to the *Place of the Work*;

.6 the provision of necessary tools, equipment or personal protective equipment to all persons at the *Place of the Work*, including all *Contractor Personnel* and authorized visitors to the *Place of the Work*;

.7 the need to install any temporary facilities or structures (such as wash stations); and

.8 the need to implement appropriate sanitation and cleaning at the *Place of the Work* and in performance of the *Work*.

10.6 The *Owner* reserves the right, in its sole discretion and by *Notice in Writing*, to delay commencement or suspend performance of the *Work*, as applicable, for such time as is reasonably necessary to mitigate or prevent risks to public health and safety resultant from *COVID-19* and the *Pandemic*. Performance of the *Work* by the *Contractor* shall be resumed upon the *Owner*'s provision of fifteen (15) days' written notice to the *Contractor*. The *Contract Time* shall be extended for such reasonable time as agreed by the *Owner* and *Contractor* and any reasonable costs related to the *Work* and directly incurred by the *Contractor* during any such period of delay shall be reimbursed by the *Owner*, except to the extent required or caused by the negligence or breach of this *Contract* by any *Contractor Personnel*. The extension of time shall not be less than the time lost as a result of such delay, unless the *Contractor* agrees to a shorter extension. The parties' agreement regarding such adjustment to the *Contract Time* and reimbursement of reasonable costs shall be set out in a *Change Order*. Otherwise, any dispute in this regard shall be resolved in accordance with PART 8 – DISPUTE RESOLUTION.

10.7 Notwithstanding any other provision in the *Contract*, if the *Contractor* is delayed in performing or unable to perform the *Work* as a result of a *Pandemic Change in Law*, then, except to the extent caused by the negligence or breach of this *Contract* by any *Contractor Personnel*, the *Contract Time* shall be extended for such reasonable time as agreed by the *Owner* and *Contractor*. The extension of time shall not be less than the time lost as a result of the *Pandemic Change in Law*, unless the *Contractor* agrees to a shorter extension. The *Contractor* shall not be entitled to payment for any costs incurred as a result of such delays, save and except as expressly provided for in paragraph 10.8 of this Article A-10.

10.8 The *Contractor* shall be entitled to payment for the following direct costs it reasonably incurs as a direct result of a *Pandemic Change in Law* provided that such costs have been approved in advance and in writing by the *Owner* and were not required or caused by the negligence or breach of this *Contract* by any *Contractor Personnel*:

.1 the *Contractor* being required to purchase, use or provide additional safety-related supplies, including personal protective equipment, in connection with its performance of the *Work*;

.2 the *Contractor* being required to install additional temporary facilities or structures, including hand washing stations; and

.3 the costs incurred by the *Contractor* to reasonably mitigate the effect of any delay to performance of the *Work* resultant from a *Pandemic Change in Law*.

10.9 Notwithstanding any other term of this *Contract*:

.1 the *Contractor* shall not be entitled to any extension of *Contract Time* or to any compensation in respect of any *Pandemic Change in Law* or delay referred to in this Article A-10 to the extent such delay or costs resulted from the *Contractor*'s failure to take reasonable steps to mitigate the effect of the delay or *Pandemic Change in Law*, as applicable;

.2 in no event shall the *Owner* be liable for any costs or damages incurred by the Contractor as a result of any *Pandemic Change in Law* or delay referred to in this Article A-10 except as expressly stipulated in this *Contract*, including no liability for: (i) any costs associated with increased labour or material costs; (ii) any costs associated with supply chain impacts or delays; or (iii) any *Consequential Damages*;

.3 there will be no unjust enrichment from a *Pandemic Change in Law.*

10.10 In all cases where the *Contractor* considers itself entitled to an extension of the *Contract Time* or compensation as a result of *COVID-19*, the *Pandemic* or a *Pandemic Change in Law*, the *Contractor* shall provide the *Owner* with *Notice in Writing* within five (5) *Working Days* of the date on which the *Contractor* knew that it was so impacted. The *Contractor* shall keep detailed records of all resultant additional costs and schedule impacts and shall provide such records to the *Owner*, including with such Notice in Writing to the extent available at such time. Additionally, the *Contractor* shall seek the *Owner*'s approval in writing in advance of taking any measures to mitigate the impact of *COVID-19*, the *Pandemic* or a *Pandemic Change in Law*."

ARTICLE A-11 - INTERPRETATION AND OTHER MATTERS

11.1 In the *Contract Documents* the word "including" means "including without limitation", and the word "includes" means "includes without limitation".

11.2 If any provision of the *Contract* is determined to be invalid, illegal or unenforceable in whole or in part, such invalidity, illegality or unenforceability will only apply to such provision or part, as the case may be, and any other part and all other provisions of the *Contract* shall remain in full force and effect. Furthermore, the parties shall endeavour to agree on a provision which reflects insofar as reasonably possible the commercial intentions of the invalid, illegal or unenforceable provision or part.

11.3 Each party shall from time to time execute and deliver all such further documents and instruments and do all acts and things as the other party may reasonably require to effectively carry out, better evidence or perfect the full intent and meaning of the *Contract*.

11.4 The provisions of the *Contract* which by their nature are continuing shall survive termination of the *Contract*."

DEFINITIONS

SC-7 Amend the definition of ***Consultant*** by adding the following to the end:

"Notwithstanding the foregoing, where the *Owner* has not engaged a person or entity to act as the "*Consultant*" such that no person or entity is so identified in the Agreement, the *Owner* shall be deemed to be the *Consultant* under the *Contract*."

SC-8 Amend the definition of ***Contract Price*** by adding the following to the end:

"For certainty, the *Contract Price* is inclusive of the *Warranty Security*."

SC-9 Delete the definition of ***Contract Time*** and replace it with the following:

"***Contract Time***
The *Contract Time* is the time from commencement of the *Work* to the date of *Completion*, including the *Ready-for-Takeover Date* and *Completion Date*."

SC-10 Amend the definition of ***Other Contractor*** by adding the following to the end after the word "*Project*":

"or for other work at the *Place of the Work*"

SC-11 Amend the definition of ***Payment Legislation*** by adding the following to the end:

"For certainty, where the *Place of the Work* is in Ontario *Payment Legislation* means the *Construction Act*."

SC-12 Add the following new definitions:

"***Abnormally Adverse Weather Condition***
Abnormally Adverse Weather Condition means an extreme and unusual climatic condition characterized by wind speed, air temperature, precipitation, or snow fall that is less than or greater than (as applicable) one and a half (1.5) standard deviations from the mean condition determined from the official weather records of Environment and Climate Change Canada (or its successor) for the 10-year period immediately preceding the date of the abnormally adverse weather event.

Addenda
Addenda means any additions or changes to the tender documents issued by the Owner for the Work prior to the time of bid closing, if any.

Agreement Term Sheet
Agreement Term Sheet means the terms, such as dates and values that form part of the Contract as stipulated in Appendix 1 to the Supplementary Conditions – Agreement Term Sheet.

Affiliate
Affiliate means, with respect to a *Person*, or *Person* who directly or indirectly controls, is controlled by, or is under direct or indirect common control with, such *Person*, and includes any *Person* in like relation to an *Affiliate*. A *Person* shall be deemed to "control" another *Person* if such *Person* possesses, directly or indirectly, the power to direct or cause the direction of the management and policies of such other *Person*, whether through the ownership of voting securities, by contract or otherwise; and the term "controlled" shall have a similar meaning. Without limiting the foregoing, any reference to an *Affiliate* of the *Owner* shall include any *Owner Entity*.

Applicable Law
Applicable Law means: (a) all laws, constitutions, treaties, statutes, codes, ordinances, orders, decrees, rules, regulations and by-laws which are or become in force during the performance of the *Work* and which relate to the *Project* or the *Work*, including the *Construction Act*, the *Environmental Protection Act*, the *OHSA* and the *WSIA*; (b) all judgments, orders, writs, injunctions, decisions, awards and directives of any *Governmental Authority* applicable to the *Project* or the *Work*; and (c) all policies, standards, guidelines, notices and protocols of any Governmental Authority applicable to the *Project* or the *Work*. For greater certainty, *Applicable Law* includes any restrictive covenants registered on title to the *Place of the Work*, the terms and conditions of any permit, authorization, certificate or approval issued by a *Governmental Authority* for the *Project* or the *Work*, and the terms and conditions of any official plan, zoning by-law, development agreement or site plan agreement related to the *Project* or the *Work*.

Arbitration Act
Arbitration Act means the Arbitration Act, 1991, SO 1991, c. 17, as amended from time to time, or its successor legislation, and includes all regulations enacted thereunder.

Background Reports
Background Reports means all reports, information and other documentation prepared by *Owner*, *Consultant*, and third parties referenced in the *Contract Documents* and made available to the Contractor regarding conditions at the *Place of the Work* and/or for performance of the *Work*.

Claims
Claims means any and all claims, liabilities, expenses, demands, losses, damages, actions, costs (including legal costs), interest, fines, suits, or proceedings of every nature and kind whatsoever.

Completion
Completion means when the price of completion of the *Work*, including correction of any known defects, is not more than the lesser of (i) one (1%) percent of the *Contract Price*; and (ii) $5,000, as certified by the *Consultant* in accordance with this *Contract* and the *Payment Legislation*.

Completion Date
Completion Date means the date set out for achievement of *Completion* in the *Agreement Term Sheet*, as such date may be adjusted in accordance with the *Contract*.

Confidential Information
Confidential Information means this *Contract* and all information or material of the *Owner Entities* that is of a proprietary or confidential nature, whether it is identified as proprietary or confidential or not and whether in written, documentary, graphic, oral, electronic, computer readable and/or any other form whatsoever. *Confidential Information* includes:

.1 any information concerning or related to this *Contract* or the business or affairs of any *Owner Entities*;

.2 the prior and future discussions between *Contractor Personnel* and *Owner Entities* regarding any business transactions between them;

.3 information concerning intellectual property, financial information, budgets, engineering and technical reports and information, environmental reports, *Project* design information, marketing plans and sales information, know-how, cost, *Deliverables*, architectural information, contractual arrangements including, terms of agreements with *Owner Entities*, all proprietary business information or personal information; and

.4 information in any way derived by or generated by or which comes to the knowledge of the *Contractor Personnel* from such *Confidential Information*.

The following shall not be considered to be *Confidential Information*:

.5 information that is or becomes publicly known through no wrongful act of the *Contractor* or *Contractor Personnel*;

.6 information that the *Contractor* obtains from a third party that has the right to disclose it;

.7 information that the *Contractor* can establish, by documentary evidence, was already known by the Contractor at the time of the initial disclosure of the *Confidential Information* by the *Owner* or *Consultant*; and

.8 information that the *Contractor* can establish, by documentary evidence, was independently developed by or on behalf of the *Contractor* without reference to the *Confidential Information*.

Consequential Damages
Consequential Damages means (i) any consequential, incidental, special, punitive, exemplary or indirect damages, and (ii) damages of any kind, however caused or characterized, for loss of actual or anticipated revenue or profits, business interruption, loss of reputation, loss of use, loss of business opportunity, increased capital or operating costs, or increased financing costs.

Construction Act
Construction Act means the *Construction Act*, RSO 1990, c. C.30, as amended from time to time, or its successor legislation, and includes all regulations enacted thereunder.

Contractor IP
Contractor IP means all designs, processes, ideas, concepts, products, recommendations, suggestions, know-how, technical expertise, methods and all *Intellectual Property Rights* owned or developed by the *Contractor Personnel*.

Construction Schedule
The *Construction Schedule* means the schedule provided by the *Contractor* and approved by the *Consultant* pursuant to subparagraph 3.4.1.1.

Contractor Personnel
Contractor Personnel means the *Contractor* and all *Subcontractors* and *Suppliers* and any other *Persons* engaged by them to perform or supply any part of the *Work* or the *Contractor*'s obligations under this *Contract*, including any employees, partners, officers, directors, agents, subcontractors, subconsultants, and other *Persons* for whom they are responsible at law.

COVID-19
COVID-19 means the SARS-CoV-2 novel coronavirus that causes the disease known as COVID-19 and includes any mutation or variant of such coronavirus.

Deliverables
Deliverables means all plans, sketches, designs, drawings, graphic representations, *Submittals*, specifications, notes, data, samples, materials, studies, reports, computer models, scale models, mock-ups, samples, reproducible and other documents and electronic data collected, developed or produced by the *Contractor Personnel* in performance of the *Work*, including all *Intellectual Property Rights* relating thereto, if any.

Effective Date
Effective Date means the date of this *Contract* as identified on the first page of the *Agreement*.

Environmental Consultant
Environmental Consultant means the professional consultant retained by the *Owner* that meets the qualifications of a "qualified person" as defined under the *Soil Regulations*.

Environmental Protection Act
Environmental Protection Act means the *Environmental Protection Act*, RSO 1990, c. E.19, as may be amended from time to time, or its successor legislation, and includes all regulations enacted thereunder.

Excess Soil
Excess Soil shall have the meaning given in the Soils Regulations.

Force Majeure Event
Force Majeure Event means any cause or event (other than bankruptcy, insolvency or lack of funds) which prevents performance by the *Contractor* of any of its obligations under the *Contract* in whole or in part and which further meets each of the following criteria: (a) the cause or event and its effects are beyond the *Contractor*'s reasonable control; (b) the *Contractor* could not reasonably have prevented, overcome, mitigated or removed the cause or event and its effects by commercially reasonable efforts and due diligence; and (c) the cause or event and its effects do not result from (i) the *Contractor*'s bankruptcy, insolvency, lack of funds or impecuniosity, (ii) act, omission or negligence of any *Contractor Personnel*, or (iii) breach of the *Contractor*'s obligations under this *Contract*. For certainty, a *Force Majeure Event* shall in no circumstance include (i) *COVID-19*, the *Pandemic* or a *Pandemic Change in Law* (including a *Governmental Response*), (ii) climatic or weather conditions other than *Abnormally Adverse Weather Conditions*, or (iii) economic, financial or market conditions or events.

Governmental Authority
Governmental Authority means (a) any federal, provincial, county, municipal, local or other governmental or public department, court, minister, governor-in-council, cabinet, commission, board, bureau, agency, commissioner, tribunal or instrumentality, (b) any subdivision or authority of any of the foregoing, and (c) any quasi-governmental or private body exercising any regulatory authority under or for the account of any of the foregoing. For certainty, *Governmental Authority* includes The Regional Municipality of Halton and the Municipality.

Governmental Response
Governmental Response means legislative amendments, controls, orders, requests and requirements imposed by *Governmental Authorities* in respect of or in response to *COVID-19* or the *Pandemic*. For certainty, *Governmental Response* includes a *Pandemic Change in Law* and the best practices recommended by the Ontario Ministry of Labour for construction site health and safety during the *Pandemic*.

Intellectual Property Rights
Intellectual Property Rights means all intellectual property rights (including rights in the nature of any copyright, trade mark, trade secret, service mark, design, drawing, patent, know-how, secret process and other similar proprietary rights, whether or not registered) and the rights to the registration of those rights and all rights or forms of protection of a similar nature or having equivalent or similar effect to any of these rights (and every renewal or extension of those rights) conferred under statute or common law or equity in any country.

MFIPPA
MFIPPA means the *Municipal Freedom of Information and Protection of Privacy Act*, R.S.O. 1990, c. M.56, as amended from time to time, or its successor legislation, and includes all regulations enacted thereunder.

Municipality
Municipality means the lower-tier municipality of the *Place of the Work*.

Net Actual Cost
Net Actual Cost means the total cost of all labour and materials identified in paragraph 6.3.7, excluding *Value Added Taxes*, but including all other eligible taxes, and is the amount prior to the application of any mark-up or additional payment rate when determining the cost of the subject work.

Notice of Award
Notice of Award means *Notice in Writing* issued by the *Owner* to the *Contractor* directing them to commence performance of the *Work*.

OHSA
OHSA means the *Occupational Health and Safety Act*, R.S.O. 1990, c. O.1, as amended from time to time, or its successor legislation, and includes all regulations enacted thereunder.

Overhead
Overhead includes: (i) costs for all items in Division 01 of the *Specifications*; (ii) all site and head office overheads of all *Contractor Personnel*; (iii) financing costs; (iv) the salaries of superintendents, engineers, timekeepers, accountants, clerks, watch persons and all other site supervision staff above foreperson employed directly for the subject *Work*; (v) coordination with other trades affected; (vi) use of temporary offices, sheds and other general temporary site support facilities and all utilities used therein; and (vii) licences and permits other than those specific to a particular item of the *Work*. For certainty, *Overhead* includes all costs not expressly included in valuation of a change in paragraph 6.3.7.

Owner's Agent
Owner's Agent means the person or entity identified as such in the *Agreement Term Sheet*, if any.

Owner Entities
Owner Entities means the *Owner*, the *Owner's Agent* and the *Municipality*, including any employees, partners, officers, directors, agents, Members of Regional Council, and other Persons for whom they are responsible at law.

Owner Personnel
Owner Personnel means the *Owner*, the *Owner's Agent*, the *Consultant*, all *Other Contractors* and any other *Persons* engaged by them in respect of the *Work*, the *Project* or the *Owner*'s obligations under this *Contract*, including any employees, partners, officers, directors, agents, subcontractors, subconsultants, and other *Persons* for whom they are responsible at law.

Pandemic
Pandemic means the *COVID-19* pandemic declared by the World Health Organization to be a pandemic on March 11, 2020, and shall include such continuing or resurgent effects of *COVID-19* upon public health as may persist notwithstanding that it may no longer constitute a declared pandemic or other public health emergency as of the *Effective Date*.

Pandemic Change in Law
Pandemic Change in Law means any change, amendment, modification, repeal or replacement in *Applicable Law* or a *Governmental Response* that: (i) came into effect after the *Effective Date*; (ii) is directly resultant from or related to the *Pandemic* or the occurrence, control or spread of *COVID-19*; and (iii) directly affects performance of the *Work*, including the *Contract Time* or the *Contract Price*. For certainty, a *Pandemic Change in Law* includes any obligation to delay commencement or suspend performance of the *Work* due to a *Governmental Response* coming into effect after the *Effective Date*.

Person
Person includes an individual, a corporation, a partnership, a trust, an unincorporated organization, a *Governmental Authority*, and the executors, administrators or other legal representatives of an individual in such capacity.

Phase of the Work
Phase of the Work has the meaning given in paragraph 5.4.7.

Proper Invoice
*Proper Invoic*e means an application for payment that includes each of the elements listed in Appendix 2 to the Supplementary Conditions – Proper Invoice Requirements.

Ready-for-Takeover Date
Ready-for-Takeover Date means the date set out for achievement of *Ready-for-Takeover* in the *Agreement Term Sheet*, as such date may be adjusted in accordance with the *Contract*.

Soil Regulations
Soil Regulations means Ontario Regulation 406/19 – On-Site and Excess Soil Management as made under the *Environmental Protection Act*, as may be amended from time to time, or its successor regulation.

Submittals
Submittals are documents or items required by the *Contract Documents* to be provided by the *Contractor*, including *Shop Drawings*, samples, models, mock-ups, as-built drawings and operation and maintenance manuals.

Standard of Care
Standard of Care means the standard of care, competence, skill and diligence that would normally be provided by an experienced and prudent contractor supplying similar work and services for a project of similar size, scope, complexity, quality and prestige as the Project and in the same or similar locality as the Project.

Warranty Period
Warranty Period has the meaning given in paragraph 12.3.1.

Warranty Security
Warranty Security has the meaning given in paragraph 4.6 of Article A-4.

WSIA
WSIA means the *Workplace Safety and Insurance Act, 1997*, S.O. 1997, c. 16, Sched. A, as amended from time to time, or its successor legislation, and shall include all regulations enacted thereunder.

WSIB
WSIB means the Workplace Safety & Insurance Board of Ontario, which operates under the authority of the *WSIA*."

GENERAL CONDITIONS

GC 1.1 CONTRACT DOCUMENTS

SC-13 Delete paragraphs 1.1.3 and 1.1.4 in their entirety and replace them with the following:

"1.1.3 The *Contractor* shall in accordance with the *Standard of Care* review the *Contract Documents* for the purpose of facilitating co-ordination and execution of the *Work* by the *Contractor*. The *Contractor* shall report promptly to the *Consultant* any ambiguities, design issues or other matters requiring clarification made known to the *Contractor* or that the *Contractor* may discover from such a review.

1.1.4 Except for its obligation to review the *Contract Documents* and report the result pursuant to paragraph 1.1.3, the *Contractor* is not responsible for ambiguities, design issues or other matters requiring clarification in the *Contract Documents* and does not assume any responsibility to the *Owner* or to the *Consultant* for the accuracy of the *Contract Documents*. Without limiting the foregoing, the *Contractor* shall not be liable for any damages or costs resulting from any ambiguities, design issues or other matters requiring clarification in the *Contract Documents* which the *Contractor* could not reasonably have discovered from such a review in accordance with the *Standard of Care*. If the *Contractor* does discover any ambiguities, design issues or other matters requiring clarification in the *Contract Documents*, the *Contractor* shall notify the *Owner* and *Consultant* in writing and not proceed with the work affected until the *Contractor* has received modified or additional information from the *Consultant* or *Owner* in writing. The impacts of any ambiguities, design issues or other matters requiring clarification in the *Contract Documents*, including to the *Contract Price* and *Contract Time*, shall be addressed by the parties in accordance with Part 6 – CHANGES."

SC-14 Delete subparagraph 1.1.5.1 in its entirety and replace it with the following:

".1 the order of priority of documents, from highest to lowest, shall be:

- Appendix 1 to the Supplementary Conditions – *Agreement Term Sheet*
- *Addenda*
- the Agreement between *Owner* and *Contractor*, as amended by the Supplementary Conditions
- the Definitions, as amended by the Supplementary Conditions
- the General Conditions, as amended by the Supplementary Conditions
- Appendix 2 to the Supplementary Conditions – Proper Invoice Requirements
- Appendix 3 to the Supplementary Conditions – Insurance
- Division 01 of the *Specifications*
- technical *Specifications*
- material and finishing schedules
- the *Drawings*
- *Background Reports*"

SC-15 Add the following to the end of subparagraph 1.1.6.2 after the words "the *Work*":

", except to the extent the *Consultant* is indemnified as a third party beneficiary as provided in subparagraphs 9.2.7.4 and 9.5.3.4 and in paragraph 13.1.1."

SC-16 Add new paragraph 1.1.12 as follows:

"1.1.2 The parties acknowledge and agree that this *Contract* represents the entire agreement between the parties in respect of the *Work* and the *Project* and no document shall form part of the *Contract Document* unless expressly identified in Article A-3. For certainty, no letter of intent, purchase order or work order issued by the *Owner* in respect of any of the *Contract*, the *Work* or the *Project* shall form part of the *Contract Documents* and no terms or conditions therein, if any, shall be of any force and effect."

GC 1.4 ASSIGNMENT

SC-17 Delete paragraph 1.4.1 in its entirety and replace it with the following:

"1.4.1 The *Contractor* shall not assign, transfer or novate all or any part of the *Contract* without the written consent of the *Owner*, which consent may be withheld in the *Owner's* sole and absolute discretion. The *Owner* may assign, transfer or novate all or a portion of this *Contract* or any right, benefit or interest in all or any portion of this *Contract*, to any *Affiliate* or to any purchaser of all or part of the *Place of the Work* or *Project* in its sole discretion. The *Owner* shall otherwise not assign, transfer or novate all or any portion of the *Contract* without the written consent of the *Contractor*, which consent shall not be unreasonably withheld."

GC 2.2 ROLE OF THE CONSULTANT

SC-18 Delete the second sentence in paragraph 2.2.3 in its entirety and replace it with the following:

"The duties, responsibilities and limitations of authority of such project representatives shall be those of the *Consultant* as described in the *Contract Documents*."

SC-19 In the first line of paragraph 2.2.6, delete the words "Except with respect to GC 5.1 – Financing Information Required by the *Owner*,".

SC-20 In paragraph 2.2.8:

(1) in both the first and second sentences add the words ", written statements" after the word "interpretations"; and

(2) add the following to the end:

"The *Owner* and the *Contractor* shall waive any claims against the *Consultant* arising out of its making of any interpretations, written statements or findings in accordance with paragraphs 2.2.6, 2.2.7, 2.2.8, and 7.1.2, but only to the extent that any such interpretations, written statements, and findings are made by the *Consultant* in an unbiased manner and in accordance with the *Consultant*'s professional standard of care at law."

SC-21 In paragraph 2.2.18 delete the word "immediately" and add the following to the end "Notwithstanding the foregoing, while the *Owner* will consider any reasonable objections of the *Contractor*, the *Owner* shall have absolute discretion in its appointment of a new *Consultant*."

GC 2.3 REVIEW AND INSPECTION OF THE WORK

SC-22 In the second sentence of paragraph 2.3.1 add the words "and the *Owner*" immediately following the words "the *Consultant*".

GC 2.4 DEFECTIVE WORK

SC-23 Delete paragraph 2.4.1 in its entirety and replace it with the following:

"2.4.1 The *Contractor* shall promptly correct at its expense and in a manner acceptable to the *Owner* and *Consultant* defective work that has been rejected by the *Consultant* or *Owner* as failing to conform to the *Contract Documents* whether or not specifically identified by the *Consultant* or *Owner* and whether or not the defective work was incorporated in the *Work* or the defect is the result of poor workmanship, use of defective products or damage through carelessness or other act or omission of the *Contractor*. The *Contractor* shall prioritize the correction of any defective work which, in the sole discretion of the *Owner*, adversely affects the day-to-day operations of the *Owner*, including as required by paragraph 12.3.4, and shall otherwise prioritize the correction of defective work as required so as not to interfere with, or derogate from, the *Construction Schedule*. Subject to paragraph 2.4.3 and without prejudice to any other right or remedy under this *Contract* or at law and without affecting the warranty period, if the *Contractor* fails to correct such defective work within a reasonable amount of time as determined by the *Consultant*, the *Owner* may have such defective work corrected by its own forces or *Other Contractors* at the *Contractor*'s expense. Any testing (including retesting by the *Owner*) to ensure that the defective work has been corrected and complies with the *Contract Documents* shall also be carried out at the *Contractor's* expense. The *Contractor* shall not be entitled to any adjustment of the *Contract Time* for correction of defective work and the *Owner* may deduct any expenses incurred pursuant to this paragraph 2.4.1 from any amounts due and owing to the *Contractor* under this *Contract*."

GC 2.5 OWNER'S AGENT

SC-24 Add new GC 2.5 – OWNER'S AGENT as follows:

"GC 2.5 OWNER'S AGENT

2.5.1 The *Owner's Agent* shall have the authority to exercise all rights and obligations of the *Owner* under this *Contract*.

2.5.2 Subject to any notified limitations in authority, the *Contractor* may rely upon any written instructions or directions provided by the *Owner's Agent.* Neither the authority of the *Owner's Agent* to act, nor any decision to exercise or not exercise such authority, shall give rise to any duty or responsibility of the *Owner's Agent* to any *Contractor Personnel."*

GC 3.1 CONTROL OF THE WORK

SC-25 Add new paragraphs 3.1.3 to 3.1.6 as follows:

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

3.1.4 To the extent applicable, the *Contractor* shall in consultation with the *Owner* schedule, coordinate and perform the *Work* as required to prevent or, where prevention is not possible, to minimize, any impacts to the *Owner's* continuing business operations.

3.1.5 The *Contractor* and its *Subcontractors* shall attend meetings with respect to the *Work* as may be directed by the *Consultant* or *Owner*. The *Contractor* shall not claim any extra compensation for attendance at these meetings. The *Contractor* and its *Subcontractors* shall provide competent representatives to attend such meetings who are authorized to make undertakings on their behalves.

3.1.6 Prior to commencement of the *Work* the *Contractor* shall provide to the *Owner* certificates of insurance evidencing coverage as required by this *Contract*, a clearance certificate from the *WSIB* stating that all amounts owed to date have been paid in full."

GC 3.2 CONSTRUCTION BY OWNER OR OTHER CONTRACTORS

SC-26 In paragraph 3.2.1 add the words "or for other work at the *Place of the Work*" after the words "the *Project*".

SC-27 Delete subparagraph 3.2.2.1 in its entirety and replace it with the following:

".1 cause such *Other Contractors* and *Owner's* own forces to comply with the instructions of the *Contractor* relating to coordination and scheduling of the activities and work of such *Other Contractors* and the *Owner's* own forces at the *Place of the Work* with the *Work* of the *Contract*."

GC 3.4 CONSTRUCTION SCHEDULE

SC-28 Delete paragraph 3.4.1 in its entirety and replace it with the following:

"3.4.1 The *Contractor* shall:

.1 prepare and submit to the *Owner* and the *Consultant* ten (10) *Working Days* after receipt of the *Notice of Award* a construction schedule that meets all requirements of the *Contract Documents* and that indicates the timing of the major activities of the *Work* and provides sufficient detail of the critical events and their interrelationship to demonstrate the *Work* will be performed in conformity with the *Contract Time*. Upon the *Consultant*'s acceptance of such schedule in writing, in consultation with the *Owner*, it shall become the *Construction Schedule*;

.2 make the native form of the *Construction Schedule* available to the *Owner* and *Consultant* upon request;

.3 complete the *Work* in accordance with the *Construction Schedule* and provide the expertise and resources, including manpower and *Construction Equipment*, as necessary to maintain progress under the *Construction Schedule*;

.4 monitor the progress of the *Work* on a bi-weekly basis relative to the *Construction Schedule* and advise the *Consultant* and the *Owner* bi-weekly in writing of any variation from or slippage in performance of the *Work* in accordance with the *Construction Schedule*, together with a detailed explanation of any delays and a plan to mitigate the delay;

.5 advise the *Consultant* of any revisions required to the *Construction Schedule* as the result of extensions of the *Contract Time* as provided in Article A-10 and Part 6 – CHANGES IN THE WORK;

.6 update and submit to the *Consultant* and *Owner* an electronic copy of an updated *Construction Schedule* on a monthly basis and upon request by the *Consultant* or *Owner*, which submission shall include a comparison of the updated *Construction Schedule* to the accepted *Construction Schedule*, a summary of actual and forecast progress of the *Work* relative to the *Construction Schedule*, and a description of the basis of and logic for any changes made to the *Construction Schedule* in conformance to requirements of the *Contract Documents*; and

.7 subject to Article A-10 and Part 6 – CHANGES IN THE WORK, provide overtime work without adjustment to the *Contract Price* if such work is deemed necessary to mitigate delay and/or recoup lost time in order to meet the *Construction Schedule*."

SC-29 Add new paragraph 3.4.2 as follows:

"3.4.2 At the time of commencement of the *Work*, the *Contractor* shall prepare for the review and acceptance of the *Owner* and the *Consultant* a schedule indicating the times within the *Construction Schedule* that *Products* specified to be purchased by the *Owner* and installed or connected by the *Contractor* are required to be delivered to the *Place of the Work* to allow for performance of the *Work* within the *Contract Time* and avoid delaying the progress of the *Work*."

GC 3.6 SUBCONTRACTORS AND SUPPLIERS

SC-30 Add the following to paragraph 3.6.2:

"The *Contractor* agrees not to change any such *Subcontractors* without the prior written consent of the *Owner*, such consent not to be unreasonably withheld."

SC-31 Add the following new paragraph 3.6.7 to 3.6.8:

"3.6.7 Ten (10) *Working Days* after receipt of the *Notice of Award* the *Contractor* shall submit to the *Owner* a list of all *Subcontractors* proposed to perform the *Work* and the names of all senior staff of the *Contractor* that will perform, supervise and coordinate the *Work*.

3.6.8 Notwithstanding any other term in this *Contract*, under no circumstance shall the *Contractor* employ as a *Subcontractor* or *Supplier* any *Person* identified on the *Owner's* list of suspended subcontractors and suppliers which list is available online here: [https://www.halton.ca/The-Region/Finance-and-Transparency/Doing-Business-with-the-Region]. The *Contractor* shall not be entitled to adjustment of the *Contract Price* or *Contract Time* where it is required to change a proposed *Subcontractor* or *Supplier* due to their inclusion on such list. The *Contractor* shall also prohibit its *Subcontractors* and *Suppliers* from employing for the *Project* any such *Persons*."

GC 3.7 LABOUR AND PRODUCTS

SC-32 Add the following to the end of paragraph 3.7.1:

"The *Contractor* represents that it has sufficient skilled employees to replace, subject to the *Owner*'s approval, acting reasonably, its designated supervisor and project manager in the event of death, incapacity, removal or resignation."

SC-33 Add paragraphs 3.7.4 to 3.7.9 as follows:

"3.7.4 Ten (10) *Working Days* after receipt of the *Notice of Award* the *Contractor* shall submit to the *Owner* and *Consultant* an itemized list of *Suppliers* and manufacturers for *Products* that are to be supplied for the *Work* as specified in the *Contract Documents*. The *Contractor* shall provide the specification section reference, description of the *Product*, manufacturer, *Supplier* and any other information requested by the *Owner* or *Consultant*. Upon acceptance of such list by the *Owner* the *Contractor* agrees to use the *Products* specified in such approved itemized list.

3.7.5 All products and materials existing at the *Place of the Work* as of the *Effective Date* shall remain the property of the *Owner*. All *Products* to be incorporated in the *Work* shall become the property of the *Owner* at the earlier of: (i) incorporation of the *Product* into the *Work*; and (ii) payment in whole or in part for the *Product* by the *Owner*. Notwithstanding transfer of title and ownership to the *Owner*, the *Contractor* shall remain responsible for any loss or damage to *Products* until *Ready-for-Takeover* has been achieved.

3.7.6 All *Products* which are specified in the *Contract Documents* by their proprietary names or by part or catalogue numbers, are to form the basis for the specifications of such *Products*. No substitute for any such *Products* may be used without the *Consultant's* written approval, acting reasonably. Substitutes for *Products* specified in the *Contract Documents* or approved by the *Owner* pursuant to paragraph 3.7.4 will be permitted only when: (i) request for the substitution is submitted in sufficient time to permit proper investigation and written approval by the *Consultant*, acting reasonably; and (ii) the specified *Product* has been discontinued, is unavailable or, due to such *Product*'s delivery being on the critical path it cannot be delivered within the time required for performance of the *Work* within the *Contract Time*. When requesting approval for the use of substitutes, the *Contractor* shall include in its submission sufficient details regarding the subject *Product*'s discontinuance, availability or impact on the critical path, as applicable, together with a description of any effect (increase or decrease) that the substitution may have on the *Contract Price* and, if applicable, written approval from all *Governmental Authorities*. No adjustment to the *Contract Time* shall result from the use of substitutes by the *Contractor*.

3.7.7 Where the *Contractor* is of the reasonable opinion that advanced payment for a *Product* is required to secure such *Product*'s timely supply and delivery to the *Place of the Work* in compliance with the *Construction Schedule* and *Contract Time*, the *Contractor* may seek consent from the *Owner* to include application for payment for such *Product* in a *Proper Invoice* prior to its incorporation into the *Work* by *Notice in Writing* to the *Owner* and *Consultant*, which *Notice in Writing* shall include a description of the circumstances giving rise to the need for such advanced payment and identifying whether the stockpiling or storage of such *Products* at the *Place of the Work* will be required pursuant to paragraph 3.7.8. With any *Proper Invoice* seeking advanced payment (as approved by the *Owner* pursuant to this paragraph 3.7.7), the *Contractor* shall include a receipt with proof of payment for the *Product* or such other documentation as reasonably required by the *Owner* to confirm payment by the *Contactor* for such *Product*. The *Owner* may approve or refuse any request for advanced payment for *Products* in its sole and absolute discretion.

3.7.8 No *Product*s shall be stockpiled or stored at the *Place of the Work* before their anticipated incorporation into the *Work* unless, in the reasonable opinion of the *Consultant* and the *Owner*, the stockpiling or storage of such *Products* at the *Place of the Work* is feasible and necessary or desirable, including because of advanced payment for such *Products* as approved by the *Owner* pursuant to paragraph 3.7.6, then the *Contractor* shall obtain the prior written approval of the *Owner* for stock piling or storage of *Products* at the *Place of the Work*. The *Contractor* acknowledges and accepts that the *Owner* may not have space for storage of *Products* at the *Place of the Work* and, as such, the *Contractor* agrees that the *Owner* shall not have any obligation to permit the stockpiling or storage of *Products* at the *Place of the Work*. Where the *Owner* does not approve storage of *Products* at the *Place of the Work*, the *Contractor* may elect at its sole cost to store such *Products* at an alternate location. The *Contractor* shall remove all surplus or rejected *Products* from the *Place of the Work*.

3.7.9 Where the *Owner* has made payment to the *Contractor* for *Products* prior to their delivery to the *Place of the Work*, at no additional cost to the *Owner*, the *Contractor* shall:

.1 provide the *Owner* with an executed receipt clearly identifying the *Owner* as the owner of the subject *Products* together with any available identifying information for such *Products*, such as serial numbers;

.2 ensure that the *Products* are clearly marked, identified or labelled as being the property of the *Owner* during any storage or transport of such *Products*;

.3 ensure that when such *Products* are stored at a location other than the *Place of the Work* they are kept in a segregated location and not intermingled or co-mingled with the property of the *Contractor* or any other person;

.4 ensure that the *Owner* and *Consultant* have the right to access, examine and inspect such *Products*; and

.5 ensure that such *Products* are not subject to any landlord distress rights, security interest or other encumbrance by any person."

GC 3.8 SHOP DRAWINGS

SC-34 Add the words "AND OTHER SUBMITTALS" to the title of GC 3.8 after the words "SHOP DRAWINGS".

SC-35 Add the words "and other *Submittals*" after the words "*Shop Drawings*" in paragraphs 3.8.1, 3.8.2, 3.8.3, 3.8.3.2, 3.8.5, 3.8.6, and 3.8.7.

GC 3.9 CLEAN-UP

GC 3.10 DOCUMENTS AT THE SITE

GC 3.11 USE OF THE WORK

GC 3.12 CUTTING AND REMEDIAL WORK

GC 3.13 EXCESS SOILS

SC-36 Add the following new GC 3.9 CLEAN-UP, GC 3.10 DOCUMENTS AT THE SITE; GC 3.11 USE OF THE WORK, GC 3.12 CUTTING AND REMEDIAL WORK and GC 3.13 EXCESS SOILS:

"**GC 3.9 CLEAN-UP**

3.9.1 The *Contractor* shall maintain the *Work* in a safe and tidy condition and free from the accumulation of waste products and debris, other than that caused by the *Owner Personnel*, *Other Contractors* or their employees."

3.9.2 Before applying for *Substantial Performance* as provided in GC 5.4 – SUBSTANTIAL PERFORMANCE OF THE WORK AND PAYMENT OF HOLDBACK, the *Contractor* shall remove waste products and debris, other than that resulting from the work of *Owner Personnel*, *Other Contractors* or their employees and shall leave the *Place of the Work* clean and suitable for use and occupancy by the *Owner*. The *Contractor* shall remove materials, tools, *Construction Equipment*, and *Temporary Work* not required for the performance of the remaining work.

3.9.3 Prior to submitting its *Proper Invoice* for final payment, the *Contractor* shall remove any remaining materials, tools, *Construction Equipment*, *Temporary Work*, and waste products and debris, other than those resulting from the work of *Owner Personnel, Other Contractors* or their employees.

3.9.4 All debris and waste resulting from the *Work* shall be removed from the *Place of the Work* expeditiously and shall be disposed of in accordance with the *Contract Documents* and *Applicable Law*. Salvage or materials from the *Work* shall not be sold at or near the *Place of the Work*.

3.9.5 In the event that the *Owner* or any *Governmental Authority* orders, instructs or requests that the *Owner* or *Contractor* clean-up the *Place of the Work* or any property adjacent to or in proximity to the *Place of the Work*, the *Contractor* shall be responsible for the prompt completion of such clean-up activities at its sole cost, provided that the requirement for such clean-up is related to or arises from the *Work* and except to the extent such clean-up is required due to the work of *Owner Personnel, Other Contractors* or their employees.

3.9.6 The *Owner* shall have the right to back charge the costs of cleaning required to be performed by the *Contractor* pursuant to this GC 3.9 if not done by the *Contractor* within forty eight (48) hours of receipt of written notice from the *Owner* or *Consultant*."

GC 3.10 DOCUMENTS AT THE SITE

3.10.1 The *Contractor* shall keep one copy of current *Contract Documents*, submittals, reports, and records of meetings at the *Place of the Work*, in good order and available to the *Owner* and the *Consultant*.

GC 3.11 USE OF THE WORK

3.11.1 The *Contractor* shall confine *Construction Equipment*, *Temporary Work*, storage of *Products*, waste products and debris, and operations of *Contractor Personnel* to limits indicated by laws, ordinances, permits, or the *Contract Documents* and shall not unreasonably encumber the *Place of the Work*.

GC 3.12 CUTTING AND REMEDIAL WORK

3.12.1 The *Contractor* shall perform the cutting and remedial work required to make the affected parts of the *Work* come together properly.

3.12.2 The *Contractor* shall co-ordinate the *Work* to ensure that the cutting and remedial work is kept to a minimum.

3.12.3 Cutting and remedial work shall be performed by specialists familiar with the *Products* affected and shall be performed in a manner to neither damage nor endanger the *Work*.

GC 3.13 EXCESS SOILS

3.13 The *Contractor* expressly acknowledges that, where the *Project* involves *Excess Soil*, *Applicable Law* shall include the *Soil Regulations*. In such case, notwithstanding that the *Owner* may be a "Project Leader" as defined under the *Soil Regulations,* the *Contractor* expressly agrees and acknowledges that the *Work* includes assumption, performance, and fulfillment of all liabilities, responsibilities and obligations of the Project Leader applicable to *Excess Soil* as set out in the *Contract Documents*. Without limiting the foregoing, in performance of the *Work* and its obligations under this *Contract* the *Contractor* shall coordinate and consult with the *Owner*, *Consultant* and *Environmental Consultant* as required to ensure compliance of the *Project* with the *Soil Regulations*."

GC 4.1 CASH ALLOWANCES PAYMENT

SC-37 Delete paragraph 4.1.7 in its entirety and replace it with the following:

"4.1.7 At the commencement of the *Work*, the *Contractor* shall prepare for the review and acceptance of the *Owner* and the *Consultant* a schedule indicating the times within the *Construction Schedule* that items called for under cash allowances are required to be delivered to the *Place of the Work* to avoid delaying the progress of the *Work*."

SC-38 Add new paragraph 4.1.8 in as follows:

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

GC 4.2 CONTINGENCY ALLOWANCE

SC-39 Add the following to the end of paragraph 4.2.4:

"For certainty, prior to *Contractor*'s submission of its *Proper Invoice* for final payment the *Contract Price* shall be reduced by the amount of any contingency allowance not authorized for expenditure under paragraph 4.2.3."

SC-40 Add new GC 4.3 PROVISIONAL ITEMS ALLOWANCE as follows:

"**GC 4.3 PROVISIONAL ITEMS ALLOWANCE**

4.3.1 The *Contract Price* includes the amount of the provisional items allowance, if any, stated in the *Contract Documents*.

4.3.2 The provisional item allowance includes the *Contractor's* overhead and profit in connection with such provisional items.

4.3.3 Expenditures under the provisional items allowance shall be authorized and valued as provided in GC 6.1 – OWNER'S RIGHT TO MAKE CHANGES, GC 6.2 – CHANGE ORDER and GC 6.3 – CHANGE DIRECTIVE.

4.2.4 The *Contract Price* shall be adjusted by *Change Order* to provide for any difference between the expenditures authorized under paragraph 4.3.3 and the amount of the provisional items allowance. For certainty, prior to *Contractor*'s submission of its *Proper Invoice* for final payment the *Contract Price* shall be reduced by the amount of any provisional items allowance not authorized for expenditure under paragraph 4.3.3."

GC 5.1 FINANCING INFORMATION REQUIRED OF THE OWNER

SC-41 Delete GC 5.1 in its entirety and replace it with the following:

"**GC 5.1 – DRAFT APPLICATIONS FOR PAYMENT**

5.1.1 Except as stipulated in paragraph 5.1.2, on a monthly basis and no earlier than five (5) *Working Days* after the end of the applicable monthly payment period, the *Contractor* shall submit to the *Consultant* and the *Owner* a draft application for payment for the value of the *Work* performed up to the end of the subject monthly payment period. The draft application for payment shall be in the form of the *Proper Invoice Template*. The draft application for payment must contain all information and documentation required for a *Proper Invoice* as stipulated in Appendix 2 – Proper Invoice Requirements.

5.1.2 The *Contractor* shall not submit a draft application for payment between December 24 and January 2 inclusive or on any day that is not a *Working Day*.

5.1.3 The *Contractor* shall be available upon request of the *Owner* or *Consultant* to meet and review the draft application for payment prior to *Contractor*'s submission of the corresponding *Proper Invoice*.

5.1.4 All draft applications for payment and *Proper Invoices* shall be submitted by email to the *Owner* and *Consultant* at the email addresses stipulated in the *Agreement Term Sheet* and all such email messages shall include:

.1 the sender's name, address, telephone number, fax number, if any, and e-mail address;

.2 the date and time of transmission; and

.3 the name and telephone number of a person to contact in the event of a transmission problem.

5.1.5 Where a draft application for payment or *Proper Invoice* is given by email between 4:00 p.m. and midnight, it shall be deemed to have been given on the following day."

GC 5.2 APPLICATIONS FOR PAYMENT

SC-42 Delete paragraph 5.2.1 in its entirety and replace it with the following:

"5.2.1 A minimum of five (5) Working Days following the Contractor's submission of a draft application for payment pursuant to GC 5.1 the Contractor shall submit a Proper Invoice to the Consultant and the Owner on account as provided in Article A-5 of the Agreement which Proper Invoice shall be for Work for the value of the Work performed up to the end of the subject monthly payment period. All Proper Invoices shall be submitted in accordance with paragraphs 5.1.4 and 5.1.5. Notwithstanding any other term of the Contract, including paragraph 5.1.2, the Contractor shall not submit a Proper Invoice between November 22 and January 2 inclusive or on any day that is not a *Working Day*. For certainty, application for payment in respect of the *Warranty Security* shall only be made upon satisfaction of all stipulated requirements for this milestone as set out in paragraph 12.3.8."

SC-43 Delete paragraph 5.2.2 in its entirety.

SC-44 In paragraph 5.2.3 add the words "in a *Proper Invoice*" after the words "The amount claimed" and add the following to the end:

"The amount applied for in the *Proper Invoice* for payment of the *Warranty Security* upon satisfaction of all requirements set out in paragraph 12.3.8 shall be comprised of the amount of the *Warranty Security* less any deductions to such security applied in accordance with this *Contract*."

SC-45 Delete paragraph 5.2.4 in its entirety and replace it with the following:

"5.2.4 At least 15 calendar days before submission of its first *Proper Invoice* the *Contractor* shall submit to the *Consultant*, in a form acceptable to the *Owner* and *Consultant*, acting reasonably, a schedule of values for the parts of the *Work*, aggregating the total amount of the *Contract Price*, so as to facilitate evaluation of *Proper Invoices*."

SC-46 Amend paragraph 5.2.6 by replacing the words "Applications for payment" with the words "*Proper Invoices*".

SC-47 Delete paragraph 5.2.7 in its entirety.

GC 5.3 PAYMENT

SC-48 In paragraph 5.3.1 replace the words "an application for payment" with "a *Proper Invoice*".

SC-49 Delete subparagraph 5.3.1.1 in its entirety and replace it with the following:

".1 If the *Consultant*, in consultation with the *Owner*, determines that an amount different than that applied for is properly due, the *Owner* or *Consultant* shall issue a "Notice of Non-Payment" pursuant to the *Construction Act* on behalf of the *Owner*."

SC-50 Delete subparagraph 5.3.1.2 in its entirety and replace it with the following:

".2 Subject to any "Notice of Non-Payment" issued pursuant to the *Construction Act* on behalf of the *Owner*, the *Owner* shall make payment to the *Contractor* on account as provided in Article A-5 of the Agreement – PAYMENT no later than twenty-eight (28) calendar days from the date of receipt of such *Proper Invoice* and, in any event, in compliance with the *Payment Legislation*."

SC-51 Add new paragraphs 5.3.2 to 5.3.5 as follows:

"5.3.2 If the *Contractor* fails to provide any element of a *Proper Invoice*, including a statutory declaration or the workers' compensation clearance certificate, the application for payment will not constitute a *Proper Invoice* and the *Owner* shall not be required to make payment to the *Contractor* until a complete *Proper Invoice* is submitted.

5.3.3 The *Contractor* shall have no entitlement to payment and no *Proper Invoice* may be submitted for changes in the *Work* without a written *Change Order* issued by the *Owner*.

5.3.4 The *Owner* may withhold from payment amounts as determined by the *Owner* or *Consultant*, acting reasonably, to ensure correction of defective work and may also provide for the retention of amounts in addition to the statutory holdback provided for in the *Contract* sufficient to protect the *Owner* against all liens of which the *Owner* has notice.

5.3.5 Following receipt by the *Contractor* of statutory declarations from *Suppliers* or *Subcontractors* of any tier, the *Contractor* shall promptly provide the *Owner* and *Consultant* with copies of such statutory declarations."

GC 5.4 SUBSTANTIAL PERFORMANCE OF THE WORK AND PAYMENT OF HOLDBACK

SC-52 Delete all paragraphs of GC 5.4 in their entirety and replace them with the following:

"5.4.1 When the *Contractor* considers that *Substantial Performance of the Work* has been achieved, or if permitted by the *Payment Legislation* a designated portion of the *Work* which the *Owner* agrees to accept separately is substantially performed, the *Contractor* shall, within five (5) *Working Days*, deliver to the *Consultant* and to the *Owner* a written application for a review by the *Consultant* to establish *Substantial Performance of the Work* or substantial performance of the designated portion of the *Work*, which application shall include the following:

a. A comprehensive list of work to be completed or corrected including all deficient or defective work identified by the *Owner* and *Consultant* and the cost for completion and correction of such work,

b. A list of work which cannot be performed for reasons beyond the control of the *Contractor* including the proposed date for completion of such work and the cost for completion of such work,

c. A declaration to the effect that:

i. the *Contract* is substantially performed,

ii. the performance of the balance of the *Contract* is in progress, and

iii. where the balance of the *Contract*, or a part or parts thereof cannot be performed forthwith, but must be deferred for reasons beyond the control of the *Contractor*, the balance of the *Contract* shall be completed by a fixed date,

d. All documentation required pursuant to GC 10.4 – WORKERS' COMPENSATION, including a clearance certificate from the *WSIB* stating that all amounts owed to the date of *Substantial Performance of the Work* have been paid in full,

e. A statutory declaration using the latest CCDC 9A form of "Statutory Declaration of Progress Payment Distribution by Contractor",

f. A list of all outstanding or potential *Claims* of the *Contractor* under the *Contract* as of the date of its application for *Substantial Performance of the Work*. For certainty, the provision of this list shall in no way relieve the *Contractor* of its notice obligations under the *Contract* for any *Claim*,

g. A statement identifying the value of *Work* done to the proposed date of *Substantial Performance of the Work* together with all documentation reasonably required by the *Owner* and *Consultant* to determine the value of same, and

h. A statement showing the amount of holdback monies due for release and payment when all liens that may be claimed against such holdback have expired or been satisfied, discharged or otherwise provided for under the *Payment Legislation*.

Failure to include an item on the list does not alter the responsibility of the *Contractor* to complete the *Contract*.

5.4.2 The *Consultant* will review the *Work* to certify or verify the validity of the application and shall promptly, and in any event, no later than 15 *Working Days* after receipt of the *Contractor*'s application:

.1 advise the *Contractor* in writing that the *Work* or the designated portion of the *Work* is not substantially performed and give reasons why, or

.2 state the date of *Substantial Performance of the Work* or a designated portion of the *Work* in a certificate and issue a copy of that certificate to each of the *Owner* and the *Contractor*.

For certainty, the *Contract Price* to be used in determining achievement of *Substantial Performance of the Work* shall be the *Contract Price* as amended by any *Change Orders* issued as of the date such determination is being made and shall not include any anticipated changes to the *Contract Price* not yet confirmed by *Change Order*, including in respect of any cash allowances or contingencies.

5.4.3 Within no more than 7 calendar days following receipt of the certificate from the *Consultant* pursuant to paragraph 5.4.2, the *Contractor* shall cause such certificate to be published in accordance with the requirements of the *Payment Legislation* and the *Contractor* shall issue to the *Owner* and *Consultant* an application for release of the holdback. The *Contractor*'s application for release of the holdback application shall include:

.1 a copy of the advertisement containing the certificate of *Substantial Performance of the Work* placed by the *Contractor* in the appropriate construction trade newspaper;

.2 a declaration that no written notices of lien have been received by the *Contractor;*

.3 all documentation required pursuant to GC 10.4 – WORKERS' COMPENSATION, including a clearance certificate from the *WSIB* stating that all amounts owed to the date of *Substantial Performance of the Work* have been paid in full; and

.4 a statutory declaration using the latest CCDC 9A form of "Statutory Declaration of Progress Payment Distribution by Contractor".

Except to the extent required by *Payment Legislation*, such application for release of the holdback shall not constitute an application for payment that is subject to *Proper Invoice* requirements. All holdback amounts prescribed by the *Payment Legislation* shall become due and payable to the *Contractor* following expiration of the holdback period stipulated in the *Payment Legislation* provided that all liens that may be claimed against the holdback have expired or been satisfied, discharged or otherwise provided for as required by the *Payment Legislation*.

5.4.4 There shall be no progressive release of holdback for a portion of the *Work* pursuant to any applicable *Payment Legislation*.

5.4.5 The *Owner* may refuse to pay some or all of the lien holdback amount provided that the *Owner* complies with any applicable requirements of the *Payment Legislation*.

5.4.6 **Annual Release of Holdback**

.1 Accrued lien holdback the *Owner* is required to retain under the *Payment Legislation* shall be released on an annual basis in relation to *Work* performed during the applicable annual period provided that:

i. the *Construction Schedule* is longer than one year in duration;

ii. the Contract *Price* exceeds ten million dollars ($10,000,000);

iii. the *Owner* has elected in the *Agreement Term Sheet* to release holdback on an annual basis;

iv. the *Contractor* submits to the *Owner* and *Consultant* an application for release of such holdback on an annual basis for the applicable annual period that includes a copy of the notice proposed to be given under subparagraph 5.4.6.1(v) and a statutory declaration using the latest CCDC 9A form of "Statutory Declaration of Progress Payment Distribution by Contractor"; and

v. 60 calendar days after the date of the *Contractor*'s application for release of the holdback on an annual basis and the giving of written notice in a form acceptable to the *Owner*, acting reasonably, by the *Contractor* to all *Contractor Personnel* of such application (including by posting of such notice in a visible location at the *Place of the Work*), there are no preserved or perfected liens in respect of the *Contract*, or all liens in respect of the *Contract* have been satisfied, discharged or otherwise provided for under the *Payment Legislation*.

.2 For the purposes of this paragraph 5.4.6 the applicable annual period shall be each calendar year occurring during the term of the *Contract*.

5.4.7 **Phased Release of Holdback**

.1 Accrued lien holdback the *Owner* is required to retain under the *Payment Legislation* shall be released on upon completion of each of phase of the *Work* expressly identified and described in the *Contract Documents* (each a "***Phase of the Work***") provided that:

i. the *Consultant* has certified that the subject *Phase of the Work* has been completed as required by the *Contract* Documents;

ii. the *Contract Price* exceeds ten million dollars ($10,000,000);

iii. the *Owner* has elected in the *Agreement Term Sheet* to release holdback on a phased basis;

iv. the *Contractor* submits to the *Owner* and *Consultant* an application for release of such holdback on a phased basis for the completed *Phase of the Work* that includes a copy of the notice proposed to be given under subparagraph 5.4.7.1(v) and a statutory declaration using the latest CCDC 9A form of "Statutory Declaration of Progress Payment Distribution by Contractor"; and

v. 60 calendar days after the date of the *Contractor*'s application for release of the holdback on a phased basis and the giving of written notice in a form acceptable to the *Owner*, acting reasonably, by the *Contractor* to all *Contractor Personnel* of such application (including by posting of such notice in a visible location at the *Place of the Work*), there are no preserved or perfected liens in respect of the *Contract*, or all liens in respect of the *Contract* have been satisfied, discharged or otherwise provided for under the *Payment Legislation*.

5.4.8 Subject to paragraph 5.4.5, when releasing holdback pursuant to paragraph 5.4.6 or paragraph 5.4.7 the *Owner* may retain out of such accrued lien holdback amount any sums required by law to satisfy any liens against the *Work* or, if permitted by the *Payment Legislation*, other third party monetary claims against the *Contractor* which are enforceable against the *Owner*.

5.4.9 The *Owner*'s payment of the accrued lien holdback on an annual basis or phased basis shall not limit, waive or diminish the *Contractor*'s obligations, responsibilities, duties or liabilities under the *Contract* nor shall it constitute the *Owner*'s acceptance of the *Work*. Further, no payment of holdback shall be made unless and until any liens have been satisfied, discharged or otherwise provided for under the *Payment Legislation*. Notwithstanding any such payment, the *Contractor* shall ensure that all *Work* and *Products* are protected pending *Completion* and be responsible for the correction of defects or *Work* not performed regardless of whether or not such was apparent when such payment was made. The *Contractor* shall indemnify and hold harmless the *Owner Entities* from all *Claims* resultant from the *Owner*'s release of holdback pursuant to paragraphs 5.4.6 and 5.4.7 or *Contractor*'s breach of its obligations under paragraphs 5.4.6 and 5.4.7.

5.4.10 For certainty, notwithstanding any provision of the *Agreement Term Sheet* or other *Contract Documents*, neither paragraph 5.4.6 nor paragraph 5.4.7 shall apply where the *Contract Price* as of the *Effective Date* does not meet or exceed the minimum contract price for release of holdback on an annual or phased basis established under the *Construction Act*."

GC 5.5 FINAL PAYMENT

SC-53 Delete paragraphs 5.5.1 to 5.5.4 in their entirety and replace them with the following:

"5.5.1 When the *Contractor* considers that *Completion* has been achieved, the *Contractor* shall submit a draft application for final payment within no more than five (5) *Working Days* of the claimed *Completion* date and shall submit a *Proper Invoice* to the *Owner* and *Consultant* for final payment no earlier than five (5) *Working Days* after submission of such draft application for final payment.

5.5.2 The *Consultant* will review the *Work* to certify or verify achievement of *Completion* and shall promptly, and in any event, no later than ten (10) calendar days after receipt of the *Contractor*'s *Proper Invoice* for final payment:

.1 advise the *Contractor* in writing that *Completion* has not been achieved and give reasons why, or

.2 state the date of *Completion* (as determined by the *Consultant*) in a certificate and issue a copy of that certificate to each of the *Owner* and the *Contractor*.

5.5.3 Payment of a *Proper Invoice* for final payment shall be made by the *Owner* in accordance with paragraph 5.3.1.2. All holdback amounts for finishing work prescribed by the *Payment Legislation* shall become due and payable to the *Contractor* following expiration of the holdback period stipulated in the *Payment Legislation* provided that all liens that may be claimed against such holdback have expired or been satisfied, discharged or otherwise provided for as required by the *Payment Legislation*.

5.5.4 For certainty, all references in the *Contract Documents* to final payment or a *Proper Invoice* for final payment shall refer to the *Proper Invoice* submitted by the *Contractor* and payment to be made by the *Owner* under the *Contract* following achievement of *Completion* or following the date of termination of the *Contract* or the *Contractor*'s right to continue with the *Work* notwithstanding that payment of the *Warranty Security* (less any deductions to such security applied in accordance with this *Contract*) will not be made until satisfaction of all requirements set out in paragraph 12.3.8."

GC 5.8 SET-OFF

SC-54 Add new GC 5.8 SET-OFF as follows:

"**GC 5.8 SET-OFF**

5.8.1 Notwithstanding any other provision in the *Contract* and subject to the provisions of the *Payment Legislation*, if the *Owner* has made an overpayment on any previous *Proper Invoice*, if the *Contractor* is in default under the *Contract* (including any failure to correct deficiencies as required by the *Contract*), if any amount is due and owing by the *Contractor* to the *Owner* under this *Contract*, or if the *Contractor* has not paid undisputed amounts due to *Contractor Personnel*, then without prejudice to any other right or remedy, the *Owner* may withhold or set-off payment from the *Contractor* of the amount reasonably necessary to protect the *Owner* from loss or damage arising from such event."

GC 6.2 CHANGE ORDER

SC-55 Add new paragraph 6.2.1A as follows:

"6.2.1A If the *Contractor* is of the opinion that any direction or instruction received from the *Consultant* or the *Owner*, including any *Supplemental Instruction*, constitutes a proposed change in the *Work*, it shall give the *Consultant* and *Owner Notice in Writing* of such change within 5 *Working Days*, which notice shall include a written description of the alleged change in the *Work*, including a description of the anticipated impact to the *Contract Price* and *Contract Time* and all available supporting documentation. The *Consultant* will promptly investigate such alleged change in the *Work* and make a finding. If the finding is that such direction or instruction does constitute a change for which adjustment of the *Contract Price* and *Contract Time* is justified under the *Contract*, then, if the *Owner* does not dispute such finding within the time stipulated in Part 8 – DISPUTE RESOLUTION, the *Consultant* will issue appropriate instructions for a change in the *Work* as provided in paragraph 6.2.1. If the finding is that the direction or instruction does not constitute a change for which adjustment of the *Contract Price* or *Contract Time* is justified under the *Contract*, the *Consultant* shall provide its reasons for such finding in writing to the *Owner* and *Contractor* and the *Contractor* shall proceed with the affected *Work*, including implementation of the subject direction or instruction, and may dispute the finding of the *Consultant* under this paragraph 6.2.1A in accordance with PART 8 – DISPUTE RESOLUTION. For certainty, the *Contractor* shall not delay in its implementation of the subject direction or instruction or performance of any affected *Work* while the *Consultant* investigates the alleged change and makes a finding pursuant to this paragraph 6.2.1A."

SC-56 Add new paragraphs 6.2.3 to 6.2.6 as follows:

"6.2.3 The *Contractor* shall prepare and submit to the *Consultant* and the *Owner* all details and supporting documentation regarding impacts of a proposed change to the *Contract Price* and *Contract Time* within ten (10) *Working Days* after notice of the proposed change is given to the *Contractor* under paragraph 6.2.1 and otherwise within five (5) *Working Days* of such details and supporting documentation becoming known or available, as applicable.

6.2.4 Unless otherwise agreed by the parties, the adjustment in the *Contract Price* for any change shall be determined in accordance with paragraphs 6.3.6 and 6.3.7.

6.2.5 For valuation of changes to the *Work*, including in respect of any contemplated *Change Order* or request for a *Change Order* by the *Contractor*, the *Contractor* shall provide the *Owner* and *Consultant* with a detailed breakdown of all expenditures itemized in paragraph 6.3.7 anticipated to be incurred in respect of the change and such other documentation as reasonably required by the *Owner* and *Consultant* to determine the anticipated expenditures to be incurred by the *Contractor* attributable to the change. The foregoing detailed breakdown shall include a breakdown of the price quotation that includes the following to the extent applicable, with appropriate supporting documentation: (i) estimated labour costs, including hours and applicable hourly rates; (ii) estimated *Product* costs, including *Supplier* quotations, estimated quantities and unit prices; (iii) estimated *Construction Equipment* costs; (iv) enumeration of all other estimated costs included in the price quotation; (v) estimated credit amounts for labour and *Products* not required on account of the proposed change; (vi) *Subcontractor* quotations, including a detailed breakdown of all of the foregoing and (vii) estimated *Contractor*'s percentage fee for profit and *Overhead* as per paragraph 6.3.6. For certainty, for all changes the *Contractor*'s percentage fee shall be as stipulated in paragraph 6.3.6.

6.2.6 A *Change Order* shall be a final determination and adjustment to the *Contract Time*, and *Contract Price* in respect of the subject change and there shall be no further adjustments to the *Contract Time* or *Contract Price* or compensation or payment of any kind whatsoever based on the aggregate number, scope or value of changes in the *Work* whether resulting from *Change Orders* or *Change Directives.*

GC 6.3 CHANGE DIRECTIVE

SC-57 Delete subparagraph 6.3.6.3 in its entirety and replace it with the following:

".3 Subject to subparagraph 6.3.6.4, in respect of the *Contractor*'s percentage fee, the *Contractor* shall be entitled to apply mark-ups as follows to the actual costs of performing the work attributable to the change as determined in accordance with paragraph 6.3.7 (exclusive of *Value Added Taxes*), which mark-ups include the *Contractor*'s fee for profit and *Overhead* (including profit and *Overhead* of all *Contractor Personnel*):

i.	for *Contractor*'s own work:	a mark-up in an amount of no more than 15% of the *Net Actual Cost* of the *Contractor*'s own work
ii.	for *Subcontractor*'s own work:	a mark-up in an amount of no more than 15% of the *Net Actual Cost* of the *Subcontractor*'s own work; and
iii.	*Contractor's* mark-up on *Subcontractor*'s own work:	a mark-up in an amount of not more than 10% of the *Net Actual Cost* of the *Subcontractor*'s own work.

For certainty, no further mark-up shall be applied to any costs attributable to the change, including in respect of profit and *Overhead* for *Contractor Personnel*, and regardless of the extent to which the subject work is assigned or sublet to others. If *Work* is assigned or sublet to an associate, as defined by the *Securities Act*, RSO 1990, c. S.5, as amended, no mark-up whatsoever shall be applied."

SC-58 Add new subparagraphs 6.3.6.4 and 6.3.6.5 as follows:

".4 In no event shall the maximum aggregate mark-up applied by all levels of contract for overhead and profit pursuant to subparagraph 6.3.6.3 exceed 30% of the total *Net Actual Cost* of approved change.

.5 Where the *Owner* and *Contractor* agree in writing to a rate and pricing schedule, to the extent applicable such rate and pricing schedule will be used to determine the cost of the *Contractor*'s actual expenditures and savings under paragraph 6.3.7."

SC-59 Delete subparagraph 6.3.7.1(2) in its entirety.

SC-60 In subparagraph 6.3.7.6 add the following to the end:

"For certainty, in determining the cost of performing the work attributable to the change no mark-up shall be applied to the actual expenditures incurred by a *Subcontractor* attributable to the change, which expenditures shall be itemized as required pursuant to paragraph 6.3.15. All profit and *Overhead* of the *Subcontractor* is included in the *Contractor*'s percentage fee to be applied pursuant to subparagraph 6.3.6.3."

SC-61 Delete paragraph 6.3.11 in its entirety and replace it with the following:

"Subject to paragraph 6.3.14, any undisputed value of *Work* performed as the result of a *Change Directive* shall be confirmed by way of one or more *Change Orders* and upon issuance of any such *Change Order* these amounts may be included in progress payments."

SC-62 Add new paragraphs 6.3.14 and 6.3.15 as follows:

"6.3.14 Where a *Change Directive* stipulates a maximum amount that may be incurred in respect of such *Change Directive*, the *Contractor* shall give the *Owner* written notice at least 2 *Working Days* prior to incurring any costs in excess of such stipulated maximum and may not include in any *Proper Invoice* any amount in excess of such stipulated maximum without the prior written approval of the *Owner* in the form of a further or amended *Change Directive*. For certainty, stipulation of a maximum amount that may be incurred in respect of a *Change Directive* does not constitute the *Owner*'s agreement to the quantum of costs that may be attributable to the *Change Directive* and shall not obligate the *Owner* to issue a *Change Order* in respect of any claimed amount for the value of the *Work* performed as the result of the *Change Directive* that remains under dispute.

6.3.15 Without limiting the *Contractor*'s obligations under this GC 6.3, for valuation of any *Change Directive* the *Contractor* shall provide the *Owner* and *Consultant* with detailed itemized breakdowns of all actual expenditures itemized in 6.3.7 and incurred in respect of the change, including detailed, substantiated time sheets, purchase orders, receipts or cost vouchers from *Subcontractors* and *Suppliers* and such other documentation as reasonably required by the *Owner* and *Consultant* to determine the actual expenditures incurred by the *Contractor* attributable to the change."

GC 6.4 CONCEALED OR UNKNOWN CONDITIONS

SC-63 Amend subparagraphs 6.4.1.1 and 6.4.1.2 by adding the following after the words "*Contract Documents*" in each subparagraph:

"and which would not have been readily apparent prior to the *Contractor*'s commencement of the performance of the *Work* from review of the *Contract Documents* and *Place of the Work* by the *Contractor* as required by the *Contract Documents*, including pursuant to paragraph 1.5 of Article A-5 and paragraph 1.1.3 of GC 1.1"

GC 6.5 DELAYS

SC-64 Add the following to the end of paragraph 6.5.2:

"Notwithstanding the foregoing, (i) where the stop work order was issued as a result of or due to a *Force Majeure Event* this paragraph 6.5.2 shall not apply and the *Contractor*'s entitlement to adjustment of the *Contract Time* or *Contract Price* shall be governed by paragraph 6.5.3, and (ii) where the stop work order was issued as a result of or due to *COVID-19*, the *Pandemic* or a *Pandemic Change in Law*, including a *Governmental Response*, and was not the result of an act or fault of any Contractor *Personnel*, directly or indirectly, this paragraph 6.5.2 shall not apply and the *Contractor*'s entitlement to adjustment of the *Contract Time* or *Contract Price* shall be governed by the provisions of Article A-10 hereof."

SC-65 Delete paragraph 6.5.3 in its entirety and replace it with the following:

"6.5.3 If the *Contractor* is delayed in the performance of the *Work* by a *Force Majeure Event*, including:

.1 labour disputes, strikes, lock-outs (including lock-outs decreed or recommended for its members by a recognized contractors' association, of which the *Contractor* is a member or to which the *Contractor* is otherwise bound),

.2 fire, unusual delay by common carriers or unavoidable casualties, or

.3 *Abnormally Adverse Weather Conditions,*

then the *Contract Time* shall be extended for such reasonable time as the *Consultant* may recommend in consultation with the *Contractor*. The extension of time shall not be less than the time lost as the result of the event causing the delay, unless the *Contractor* agrees to a shorter extension. Except to the extent such delays result from actions by *Owner Personnel*, the *Contractor* shall only be entitled to payment for costs directly incurred with the *Owner*'s written approval to protect the *Work* and secure the *Place of the Work* during the period of such delay and to mitigate the impacts of such delay to performance of the *Work* within the *Contract Time*. For certainty, in the event of delay caused by or resultant from *COVID-19*, the *Pandemic* or a *Pandemic Change in Law,* including a *Governmental Response,* this paragraph 6.5.3 shall not apply and the *Contractor*'s entitlement to adjustment of the *Contract Time* or *Contract Price* shall be governed by the provisions of Article A-10 hereof."

SC-66 Delete paragraph 6.5.4 in its entirety and replace it with the following:

"6.5.4 Upon the occurrence of any event that may cause delay to performance of the *Work* the *Contractor* shall promptly give the *Owner* verbal notice of such delay event. No extension shall be made for delay unless *Notice in Writing* of the cause of delay is given to the *Consultant* and *Owner* not later than 10 *Working Days* after the commencement of the delay. In the case of a continuing cause of delay only one *Notice in Writing* shall be necessary."

SC-67 Delete paragraph 6.5.5 in its entirety and replace it with the following:

"6.5.5 No adjustment to the *Contract Time* shall be made because of failure of the *Consultant* to furnish instructions unless the *Consultant* has failed to furnish such instructions within the time stipulated in any schedule agreed-to by the parties for submission and return of *Shop Drawings* and *Submittals* and the *Contractor* has given at least two (2) *Working Days' Notice in Writing* to the *Consultant* and *Owner* of the date for upon which such instructions are required."

SC-68 Add new paragraphs 6.5.6 and 6.5.7 as follows:

"6.5.6 Any adjustment to the *Contract Time* under this *Contract* shall be determined based on the direct impacts of the subject change or delay to the critical path for performance of the *Work* as of the date of the change or delay.

6.5.7 The *Contractor* acknowledges that the *Owner* will suffer real and significant losses if the *Contractor* fails to attain *Ready-for-Takeover* by the *Ready-for-Takeover Date*.

.1 Where the *Owner* has stipulated an amount for liquidated damages in the *Agreement Term Sheet*, then if the *Contractor* fails to achieve *Ready-for-Takeover* by the *Ready-for-Takeover Date* then the *Contractor* shall be liable to the *Owner* for liquidated damages in accordance with paragraph 4.7 of Article A-4 for each day or part day of delay until *Ready-for-Takeover* is achieved as confirmed by the *Consultant* in accordance with GC 12.1. The parties agree that such liquidated damages are not a penalty and represent a reasonable, fair and genuine pre-estimate of losses to the *Owner* anticipated to result from the *Contractor*'s delay in achieving *Ready-for-Takeover* by the *Ready-for-Takeover Date*.

.2 Where the *Owner* has not stipulated an amount for liquidated damages in the *Agreement Term Sheet*, then subparagraph 6.5.7.1 shall not apply and the *Contractor* shall be liable for and shall indemnify and hold harmless the *Owner* from all *Claims* resultant from or caused by failure to achieve *Ready-for-Takeover* by the *Ready-for-Takeover Date* and/or *Completion* by the *Completion Date*, including costs incurred for the *Consultant*, any *Claims* arising under any lease agreements for the *Project* (if applicable), and any *Claims* relating to financing of the *Project*."

GC 6.6 CLAIMS FOR A CHANGE IN CONTRACT PRICE

SC-69 Delete paragraph 6.6.1 in its entirety and replace it with the following:

"6.6.1 If the *Contractor* intends to make a claim for an increase to the *Contract Price* the *Contractor* shall give *Notice in Writing* of intent to claim to the *Owner* and to the *Consultant* within five (5) *Working Days* of commencement of the event or series of events giving rise to such claim. Notwithstanding the foregoing, any claim for adjustment to the *Contract Price* resultant from *COVID-19*, the *Pandemic* or a *Pandemic Change in Law*, including a *Governmental Response*, shall be governed by the provisions of Article A-10 and this GC 6.6 shall not apply."

SC-70 Delete paragraphs 6.6.3 and 6.6.4 in their entirety and replace them with the following:

"6.6.3 The party making a claim pursuant to this GC 6.6 shall prepare and submit to the *Consultant* and other party in writing all available details and supporting documentation regarding the claim not later than ten (10) *Working Days* after commencement of the event or series of events giving rise to such claim and shall thereafter submit all such details and supporting documentation within five (5) *Working Days* of such details and supporting documentation becoming known or available, as applicable. For certainty, the supporting documentation to be submitted shall include all evidence reasonably required by the *Consultant* to make a finding and all such supporting documentation shall be prepared at the applicable party's own cost.

6.6.4 Without limiting paragraph 6.6.3, where the event or series of events giving rise to the claim has a continuing effect, the detailed account submitted under paragraph 6.6.3 shall be considered to be an interim account and the party making the claim shall, weekly or bi-weekly as the *Consultant* may reasonably require, submit further written interim accounts giving the accumulated amount of the claim and any further grounds upon which it is based. The party making the claim shall submit a final account within five (5) *Working Days* of the end of the effects resulting from the event or series of events."

SC-71 Add new paragraph 6.6.7 as follows:

"6.6.7 Where the party making a claim fails to provide notice or details and supporting documentation within the time stipulated in this GC 6.6 and such failure prevents the *Consultant* or other party from mitigating or minimizing *Claims* resultant from the event or series of events giving rise to such claim or otherwise causes the other party loss or damage, then the party making the claim shall be barred from bringing the subject claim."

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

SC-72 Delete subparagraph 7.1.5.1 in its entirety and replace it with the following:

".1 take possession of the *Work* and *Products* at the *Place of the Work*; subject to the rights of third parties, utilize the *Construction Equipment* and *Temporary Work* at the *Place of the Work*; require the *Contractor* to transfer, novate or assign all agreements with *Subcontractors* and *Suppliers* in respect of the *Work* to the *Owner* or other contractors designated by the *Owner*; finish the *Work* by whatever method the *Owner* may consider expedient, but without undue delay or expense,"

SC-73 In subparagraph 7.1.5.4 delete the words "warranty period" and replace them with the words "*Warranty Period*".

SC-74 Add a new subparagraph 7.1.5.5 as follows:

".5 set-off against any amount payable to the *Contractor* under the *Contract* all amounts payable by the *Contractor* to the *Owner*."

SC-75 Add a new paragraphs 7.1.7 and 7.1.8 as follows:

"7.1.7 The *Owner* shall not be liable to the *Contractor* for any *Consequential Damages* arising from termination pursuant to this GC 7.1.

7.1.8 The *Contractor* shall submit to the *Owner* and *Consultant* a *Proper Invoice* for final payment no later than 45 calendar days after the date of termination."

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

SC-76 Delete paragraph 7.2.2 in its entirety.

SC-77 Delete subparagraphs 7.2.3.1 and 7.2.3.2 in their entirety.

SC-78 In subparagraph 7.2.3.4 delete the words "except for GC 5.1 FINANCIAL INFORMATION REQUIRED OF THE OWNER."

SC-79 In paragraph 7.2.4, delete "5 *Working Days*" from the second line and replace with "fifteen (15) *Working Days*", and add the following to the end of the paragraph:

"The *Owner* shall be deemed not to be in default of its obligations under the *Contract* if it is taking active steps to remedy the default but cannot reasonably do so within the said fifteen (15) *Working Day* period."

SC-80 In paragraph 7.2.5, delete the words "including reasonable profit" and replace them with the words "to the date of termination" and add the words ", but shall not be entitled to compensation for any *Consequential Damages*" after the words "termination of the *Contract*".

SC-81 Add new paragraph 7.2.6 as follows:

"7.2.6 The *Contractor*'s claim for compensation under this GC 7.2 shall be submitted to the *Owner* and *Consultant* in the form of a *Proper Invoice* for final payment no later than 45 calendar days after the date of termination."

GC 7.3 TERMINATION FOR CONVENIENCE

SC-82 Add new GC 7.3 TERMINATION FOR CONVENIENCE as follows:

"**GC 7.3 TERMINATION FOR CONVENIENCE**

7.3.1 The *Owner* may in its sole discretion terminate the *Contractor*'s right to continue with the *Work* in whole or in part or this *Contract* for any reason, including without cause or for convenience, at any time by giving at least 30 calendar days' *Notice in Writing* of such termination to the *Contractor* specifying the date of termination.

7.3.2 In the event of termination pursuant to paragraph 7.3.1, the *Contractor* shall be entitled to be paid for all work performed to the date of termination, for loss sustained upon *Products* and *Construction Equipment*, and such other damages as the *Contractor* may have sustained as a direct result of such termination, but shall not be entitled to compensation for any *Consequential Damages*. The *Contractor*'s claim for such compensation shall be submitted to the *Owner* and *Consultant* in the form of a *Proper Invoice* for final payment no later than 45 calendar days after the date of termination."

GC 8.1 AUTHORITY OF THE CONSULTANT

SC-83 In paragraph 8.1.2 delete the words "paragraph 8.1.3 and paragraphs 8.3.3 to 8.3.8 of".

SC-84 In paragraph 8.1.3, add the following after the first sentence:

"The *Contractor* shall continue performance of the *Work* notwithstanding any such dispute and shall ensure all other *Contractor Personnel* also do so."

GC 8.2 ADJUDICATION

SC-85 Delete paragraph 8.2.1 in its entirety and replace it with the following:

"8.2.1 Nothing in this *Contract* shall be deemed to affect the rights of the parties to resolve any dispute by adjudication as may be provided for by applicable legislation. Further, in addition to the matters that may be referred to adjudication pursuant to the *Payment Legislation*, the parties agree that any dispute relating to costs resultant from termination of the *Contract* or of the *Contractor*'s right to continue with the *Work* or payments due and owing in the event of or following any such termination may be referred by either party to adjudication. For certainty, no dispute regarding the validity of any such termination may be referred to adjudication and any such dispute shall be resolved in accordance with GC 8.3."

SC-86 Add new paragraph 8.2.2 as follows:

"8.2.2 To the extent permitted by the *Construction Act* and except as required for performance of the parties' obligations under this *Contract* or exercise of their rights under the *Construction Act*, any adjudication in respect of the *Contract* and *Project*, including all documentation and materials exchanged and any resultant award or order issued by an adjudicator, shall be confidential as between the parties."

GC 8.3 NEGOTIATION, MEDIATION AND ARBITRATION

SC-87 Delete paragraph 8.3.1 in its entirety.

SC-88 Delete paragraph 8.3.2 in its entirety and replace it with the following:

"8.3.2 For any finding of the *Consultant* under GC 2.2 – ROLE OF THE CONSULTANT that is clearly identified as a finding for the purposes of this paragraph 8.3.2 of the *Contract*, a party shall be conclusively deemed to have accepted such finding and to have expressly waived and released the other party from any claims in respect of the particular matter dealt with in that finding unless, within 15 *Working Days* after receipt of that finding, the party sends a *Notice in Writing* of dispute to the other party and to the *Consultant*, which contains the particulars of the matter in dispute and the relevant provisions of the *Contract Documents*."

SC-89 Delete paragraphs 8.3.4, 8.3.5 and 8.3.6 in their entirety and replace them with the following:

"8.3.4 Following receipt of a responding party's *Notice in Writing* of reply under paragraph 8.3.2, the parties may elect to engage in mediated negotiations to assist the parties in reaching agreement on any unresolved dispute.

8.3.5 If the dispute is not resolved at a mediation or if the parties do not agree to mediate the dispute, either party may terminate the mediation by giving *Notice in Writing* to other party and the *Consultant*.

8.3.6 Upon termination of the mediation pursuant to paragraph 8.3.5 the dispute shall be finally resolved by arbitration which may be commenced by either party by *Notice in Writing* to the other party. The arbitration shall be conducted in the jurisdiction of the *Place of the Work* and the parties agree that the arbitral award shall be final and binding and may only be appealed to the court on a question of law subject to the leave of such court as may be granted in accordance with subsection 45(1) of the *Arbitration Act*. For certainty, there shall be no appeal of the arbitral award on a question of fact or mixed fact and law."

SC-90 Delete paragraph 8.3.7 in its entirety.

SC-91 In paragraph 8.3.8 delete the words "*Notice in Writing* requesting arbitration in paragraph 8.3.6" and replace them with the words "termination of the mediation pursuant to paragraph 8.3.5".

SC-92 Add the following new paragraphs 8.3.9 to 8.3.13:

"8.3.9 Within five *Working Days* of the termination of the mediation pursuant to paragraph 8.3.5, the *Owner* and the *Contractor* shall give the *Consultant* a written notice containing:

.1 a copy of supplementary conditions 8.3.9 to 8.3.14 of this *Contract*, and;

.2 a description of 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.

8.3.10 The *Owner* and the *Contractor* agree that the *Consultant* may elect to become a full party to the arbitration under paragraph 8.3.6 if the *Consultant*:

.1 has a vested or contingent financial interest in the outcome of the arbitration;

.2 gives the notice of election to the *Owner* and the *Contractor* within ten (10) *Working Days* of receipt of the notice under paragraph 8.3.9;

.3 agrees to be a party to the arbitration within the meaning of the rules referred to in paragraph 8.3.6, and,

.4 agrees to be bound by the arbitral award made in the arbitration.

8.3.11 Without limiting and subject to the *Owner* and *Contractor*'s rights under paragraph 8.3.12 to challenge whether the *Consultant* has satisfied the requirements of paragraph 8.3.10, if an election is made under paragraph 8.3.10:

.1 the *Owner* or *Contractor* may request particulars and evidence of the *Consultant*'s vested or contingent financial interest in the outcome of the arbitration;

.2 the *Consultant* shall participate in the appointment of the arbitrator; and,

.3 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 respondent receives a copy of the notice of arbitration.

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

.1 on application of the *Owner* or the *Contractor*, determine whether the *Consultant* has satisfied the requirements of paragraph 8.3.10, and;

.2 make any procedural order considered necessary to facilitate the addition of the *Consultant* as a party to the arbitration.

8.3.13 The provisions of paragraph 8.3.9 shall apply (with all appropriate changes being made) to written notice to be given by the *Consultant* to any sub-consultant."

GC 9.1 PROTECTION OF WORK AND PROPERTY

SC-93 Amend subparagraph 9.1.1.1 by adding the following to the end:

"which the *Contractor* could not have discovered from review as required by the *Contract Documents*, including paragraph 1.1.3 of GC 1.1"

SC-94 Delete paragraph 9.1.1.2 in its entirety and replace it with the following:

".2 negligent acts or omissions of any *Owner Personnel*."

SC-95 Delete paragraph 9.1.2 in its entirety and replace it with the following:

"9.1.2 Before commencing any *Work*, the *Contractor* shall determine the locations of all underground utilities and structures indicated in the *Contract Documents*, or that are reasonably discoverable from inspection of the *Place of the Work* as required by the *Contract Documents*, including paragraph 1.5 of Article A-1."

SC-96 Add new paragraphs 9.1.5 and 9.1.6 as follows:

"9.1.5 The *Contractor* shall cooperate in all respects, at no cost to the *Owner*, to provide accommodation and safe access to the *Place of the Work* or portions thereof as the *Owner Personnel* may require from time to time and as may be required by utility providers with equipment or operations located at the *Place of the Work*.

9.1.6 No *Owner Personnel* or *Owner Entities* shall have any liability for the safeguarding or protection of, or for the loss, theft, damage, destruction, or disappearance of, any *Construction Equipment*, *Products*, *Temporary Work* or other tangible property or materials located at the *Place of the Work*, except to the extent caused by their own negligence."

GC 9.2 TOXIC AND HAZARDOUS SUBSTANCES

SC-97 In paragraph 9.2.3 delete the first word "The" and replace it with the following:

"Without limiting any of the *Contractor*'s obligations under this *Contract*, including for overall health and safety at the *Place of the Work*, the"

SC-98 Add the following words to paragraph 9.2.6 after the word "responsible":

"or whether any toxic or hazardous substances or materials already at the *Place of the Work* (and which were then harmless or stored, contained or otherwise dealt with in accordance with *Applicable Laws*) were dealt with by the *Contractor* or anyone for whom the *Contractor* is responsible in a manner which does not comply with legal and regulatory requirements, or which threatens human health and safety or the environment or material damage to the property of the *Owner* or others,"

SC-99 Add the words "and the *Consultant*" after the word "*Contractor*" in subparagraph 9.2.7.4.

SC-100 Add the following words to paragraph 9.2.8 after the word "responsible":

"or that any toxic or hazardous substances or materials already at the *Place of the Work* (and which were then harmless or stored, contained or otherwise dealt with in accordance with *Applicable Laws*) were dealt with by the *Contractor* or anyone for whom the *Contractor* is responsible in a manner which does not comply with legal and regulatory requirements, or which threatens human health and safety or the environment or material damage to the property of the *Owner* or others,"

GC 9.4 CONSTRUCTION SAFETY

SC-101 Delete paragraph 9.4.1 in its entirety and replace it with the following:

"9.4.1 The *Contractor* shall be solely responsible for: (i) construction health and safety at the *Place of the Work*, including all responsibilities of the "constructor" under the *OHSA*; (ii) compliance with the rules, regulations, and practices required by *Applicable Laws*, including the *OHSA*; and (iii) initiating, maintaining and supervising all safety precautions and programs in connection with the performance of the *Work*. The *Contractor* shall file the requisite "notice of project" and list itself as the "constructor" with respect to the *Project*."

SC-102 Delete paragraph 9.4.4 in its entirety and replace it with the following:

"9.4.4 The *Owner* shall cause the Owner *Personnel* to comply with all health and safety precautions and programs established by the *Contractor* at the *Place of the Work*, including by requiring such compliance in any contracts with *Owner Personnel*."

SC-103 Add the following new paragraphs 9.4.6 to 9.4.11:

"9.4.6 The *Contractor* shall provide appropriate health and safety instruction and training to all *Contractor Personnel* (to the extent same have access to the *Place of the Work*) before the *Work* is commenced.

9.4.7 The *Contractor* and each *Subcontractor* having an accident or incident at the *Place of the Work*, as prescribed under the *OHSA*, shall promptly notify the *Owner* and the *Consultant*.

9.4.8 Prior to commencement of the *Work*, and again at any time upon request by the *Owner*, the *Contractor* shall provide the *Owner* with information and evidence regarding compliance with its obligations relating to health and safety under this *Contract* (including compliance with paragraph 3.1.6, GC 9.4 and paragraph 10.2.4), which evidence shall include: (i) a copy of the *Contractor*'s "notice of project" identifying the *Contractor* as the "constructor" with respect to the *Project* under the *OHSA*; (ii) a copy of all "Form 1000s" obtained by the *Contractor* from *Contractor Personnel* as required by the *OHSA*; (iii) a copy of all health and safety plans and programs prepared by the *Contractor* in respect of the *Place of the Work* and/or performance of the *Work*; (iv) a copy of the *Contractor*'s subcontracts with *Contractor Personnel*; (v) copies of training logs and meeting minutes relating to health and safety at the *Place of the Work* and/or in performance of the *Work*; (v) copies of any and all documentation filed by or submitted to any *Governmental Authority* by any *Contractor Personnel* in respect of the *Project*, the *Work* or the *Place of the Work*, including any accident or incident reports; and (vi) any other documentation relating to the *Contractor*'s health and safety obligations under this *Contract* as may be reasonably requested by the *Owner*.

9.4.9 The *Contractor* represents that it has the experience, knowledge and expertise in respect of construction health and safety necessary for performance of the *Work* and all obligations under this *Contract* in accordance with all *Applicable Laws*, including as necessary to undertake all obligations of the "constructor" under the *OHSA* and to provide for compliance with all requirements of the *OHSA* applicable to the *Place of the Work* and performance of the *Work*. The *Contractor* further acknowledges that the *Owner Entities* do not have such knowledge, experience and expertise and are accordingly relying upon the *Contractor* in this respect.

9.4.10 The *Contractor* shall indemnify and save harmless all *Owner Personnel* and *Owner Entities* from and against any and all *Claims* arising out of any safety infractions committed by any *Contractor Personnel* or resulting from any failure by the *Contractor* to fulfill its obligations under paragraph 3.1.6, paragraph 10.2.4 and/or this PART 9 – PROTECTION OF PERSONS AND PROPERTY.

9.4.11 The provisions of this GC 9.4 shall survive the completion of the *Work* or the termination of the *Contract* for any reason whatsoever."

GC 9.5 MOULD

SC-104 Add the words "and the *Consultant*" after the word "*Contractor*" in subparagraph 9.5.3.4.

GC 10.2 LAWS, NOTICES, PERMITS, AND FEES

SC-105 Replace all reference to "laws" and "applicable laws" in GC 10.2 with "*Applicable Laws*".

SC-106 Delete paragraph 10.2.5 in its entirety and replace it with the following:

"10.2.5 Subject to compliance with its obligations under paragraph 1.5 of Article A-5 and paragraph 1.1.3 of GC 1.1, the *Contractor* shall not be responsible for verifying that the *Contract Documents* are in compliance with *Applicable Laws*. If the *Contract Documents* are at variance therewith, or if, subsequent to the *Effective Date*, changes are made to *Applicable Laws* which require modification to the *Contract Documents*, the *Contractor* shall advise the *Consultant* in writing requesting direction immediately upon such variance or change becoming known. The *Consultant* will issue the changes required to the *Contract Documents* as provided in GC 6.1 – OWNER'S RIGHT TO MAKE CHANGES, GC 6.2 – CHANGE ORDER and GC 6.3 – CHANGE DIRECTIVE."

SC-107 Delete paragraph 10.2.7 in its entirety and replace it with the following:

"10.2.7 If, subsequent to the *Effective Date*, changes are made to *Applicable Laws* which affect the cost of the *Work*, either party may submit a claim in accordance with the requirements of GC 6.6 – CLAIMS FOR A CHANGE IN CONTRACT PRICE. Notwithstanding the foregoing, any claim for adjustment to the *Contract Price* resultant from *COVID-19*, the *Pandemic* or a *Pandemic Change in Law*, including a *Governmental Response*, shall be governed by the provisions of Article A-10 and this paragraph 10.2.7 and GC 6.6 shall not apply."

GC 10.4 WORKERS' COMPENSATION

SC-108 In paragraph 10.4.1, replace the word "applications for payment" with the words "*Proper Invoices*".

SC-109 Add new paragraphs 10.4.2 and 10.4.3 as follows:

"10.4.2 At any time during the term of the *Contract*, when requested by the *Owner*, the *Contractor* shall provide such evidence of compliance by the *Contractor* and *Subcontractors*.

10.4.3 The *Contractor* shall indemnify and hold harmless the *Owner* and its directors, officers and employees from and against all *Claims* by any *Contractor Personnel* with respect to workers' compensation insurance claims. This indemnity shall survive the completion of the *Work* or the termination of the *Contract* for any reason whatsoever."

GC 11.1 INSURANCE

SC-110 Revise paragraph 11.1.1 as follows:

(1) **Where the original *Contract Price* stipulated in the Agreement is equal to or less than $5,000,000:** Delete paragraph 11.1.1 and replace it with the following:

"11.1.1 Without restricting the generality of GC 13.1 – INDEMNIFICATION, the *Contractor* shall provide, maintain and pay for the following insurance coverages, the requirements of which are specified in Appendix 3 to the Supplementary Conditions – Insurance in effect at the time of bid closing except as hereinafter provided:

.1 Commercial General liability insurance in the name of the *Contractor* and include, or in the case of a single, blanket policy, be endorsed to name, the *Owner* and the *Consultant* as additional insureds but only with respect to liability, other than legal liability arising out of their sole negligence, arising out of the operations of the *Contractor* with regard to the *Work*. Commercial General liability insurance shall be maintained from the date of commencement of the *Work* until one year from the date of *Ready-for-Takeover*. Liability coverage shall be provided for completed operations hazards from the date of *Ready-for-Takeover*, as set out in the certificate of *Ready-for-Takeover*, on an ongoing basis for a period of 6 years following *Ready-for-Takeover*.

.2 Automobile Liability Insurance from the date of commencement of the *Work* until one year after the date of *Ready-for-Takeover*.

.3 Unmanned aerial vehicle aircraft, manned aircraft or watercraft Liability Insurance when owned or non-owned manned or unmanned aircraft or watercraft are used directly or indirectly in the performance of the *Work*.

.4 "Broad form Builders Risk" property insurance in the joint names of the *Contractor*, the *Owner* and the *Consultant*. The policy shall include as insureds all *Subcontractors*. The "Broad form" property insurance shall be provided from the date of commencement of the *Work* until the earliest of:

(1) 10 calendar days after the date of *Ready-for-Takeover*;

(2) on the commencement of use or occupancy of any part or section of the *Work* unless such use or occupancy is for construction purposes, habitational, office, banking, convenience store under 465 square metres in area, or parking purposes, or for the installation, testing and commissioning of equipment forming part of the *Work*; and

(3) when left unattended for more than 30 consecutive calendar days or when construction activity has ceased for more than 30 consecutive calendar days.

.5 Boiler and machinery insurance in the joint names of the *Contractor*, the *Owner* and the *Consultant*. The policy shall include as insureds all *Subcontractors*. Such coverage can be included as part of the Broad Form Builders Risk policy. The coverage shall be maintained continuously from commencement of use or operation of the boiler and machinery objects insured by the policy and until 10 calendar days after the date of *Ready-for-Takeover*.

.6 The "Broad form Builders Risk" property and boiler and machinery policies shall provide that, in the case of a loss or damage, payment shall be made to the *Owner* and the *Contractor* as their respective interests may appear. In the event of loss or damage:

(1) the *Contractor* shall act on behalf of the *Owner* for the purpose of adjusting the amount of such loss or damage payment with the insurers. When the extent of the loss or damage is determined, the *Contractor* shall proceed to restore the *Work*. Loss or damage shall not affect the rights and obligations of either party under the *Contract* except that the *Contractor* shall be entitled to such reasonable extension of *Contract Time* relative to the extent of the loss or damage as the *Consultant* may recommend in consultation with the *Contractor*;

(2) the *Contractor* shall be entitled to receive from the *Owner*, in addition to the amount due under the *Contract*, the amount which the *Owner*'s interest in restoration of the *Work* has been appraised, such amount to be paid as the restoration of the *Work* proceeds in accordance with the progress payment provisions. In addition the *Contractor* shall be entitled to receive from the payments made by the insurer the amount of the *Contractor*'s interest in the restoration of the *Work*; and

(3) to the *Work* arising from the work of the *Owner*, the *Owner*'s own forces or *Other Contractors*, the *Owner* shall, in accordance with the *Owner*'s obligations under the provisions relating to construction by the *Owner* or *Other Contractors*, pay the *Contractor* the cost of restoring the *Work* as the restoration of the *Work* proceeds and as in accordance with the progress payment provisions.

.7 Contractors' Equipment Insurance from the date of commencement of the *Work* until one year after the date of *Ready-for-Takeover*.

.8 Contractors' Pollution Liability Insurance from the date of commencement of the *Work* until one year after the date of *Ready-for-Takeover*."

(2) **Where the original *Contract Price* stipulated in the Agreement is greater than $5,000,000 and equal to or less than $25,000,000:** Delete paragraph 11.1.1 and replace it with the following:

"11.1.1 Without restricting the generality of GC 13.1 – INDEMNIFICATION, the *Contractor* shall provide, maintain and pay for the following insurance coverages, the requirements of which are specified in Appendix 3 to the Supplementary Conditions – Insurance in effect at the time of bid closing except as hereinafter provided:

.1 Wrap-up liability insurance in the name of the *Contractor* and including all *Owners, Contractors, Subcontractors* and the *Consultants engaged in the work* as insureds. Wrap-up liability insurance shall be maintained from the date of commencement of the *Work* until one year from the date of *Ready-for-Takeover*. Liability coverage shall be provided for completed operations hazards from the date of *Ready-for-Takeover*, as set out in the certificate of *Ready-for-Takeover*, on an ongoing basis for a period of 6 years following *Ready-for-Takeover*.

.2 Automobile Liability Insurance from the date of commencement of the *Work* until one year after the date of *Ready-for-Takeover*.

.3 Unmanned aerial vehicle aircraft, manned aircraft or watercraft Liability Insurance when owned or non-owned manned or unmanned aircraft or watercraft are used directly or indirectly in the performance of the *Work*.

.4 "Broad form Builders Risk" property insurance in the joint names of the *Contractor*, the *Owner* and the *Consultant*. The policy shall include as insureds all *Subcontractors*. The "Broad form" property insurance shall be provided from the date of commencement of the *Work* until the earliest of:

(1) 10 calendar days after the date of *Ready-for-Takeover*;

(2) on the commencement of use or occupancy of any part or section of the *Work* unless such use or occupancy is for construction purposes, habitational, office, banking, convenience store under 465 square metres in area, or parking purposes, or for the installation, testing and commissioning of equipment forming part of the *Work*; and

(3) when left unattended for more than 30 consecutive calendar days or when construction activity has ceased for more than 30 consecutive calendar days.

.5 Boiler and machinery insurance in the joint names of the *Contractor*, the *Owner* and the *Consultant*. The policy shall include as insureds all *Subcontractors*. Such coverage can be included as part of the Broad Form Builders Risk policy. The coverage shall be maintained continuously from commencement of use or operation of the boiler and machinery objects insured by the policy and until 10 calendar days after the date of *Ready-for-Takeover*.

.6 The "Broad form Builders Risk" property and boiler and machinery policies shall provide that, in the case of a loss or damage, payment shall be made to the *Owner* and the *Contractor* as their respective interests may appear. In the event of loss or damage:

(1) the *Contractor* shall act on behalf of the *Owner* for the purpose of adjusting the amount of such loss or damage payment with the insurers. When the extent of the loss or damage is determined, the *Contractor* shall proceed to restore the *Work*. Loss or damage shall not affect the rights and obligations of either party under the *Contract* except that the *Contractor* shall be entitled to such reasonable extension of *Contract Time* relative to the extent of the loss or damage as the *Consultant* may recommend in consultation with the *Contractor*;

(2) the *Contractor* shall be entitled to receive from the *Owner*, in addition to the amount due under the *Contract*, the amount which the *Owner*'s interest in restoration of the *Work* has been appraised, such amount to be paid as the restoration of the *Work* proceeds in accordance with the progress payment provisions. In addition the *Contractor* shall be entitled to receive from the payments made by the insurer the amount of the *Contractor*'s interest in the restoration of the *Work*; and

(3) to the *Work* arising from the work of the *Owner*, the *Owner*'s own forces or *Other Contractors*, the *Owner* shall, in accordance with the *Owner*'s obligations under the provisions relating to construction by the *Owner* or *Other Contractors*, pay the *Contractor* the cost of restoring the *Work* as the restoration of the *Work* proceeds and as in accordance with the progress payment provisions.

.7 Contractors' Equipment Insurance from the date of commencement of the *Work* until one year after the date of *Ready-for-Takeover*.

.8 Project Specific Contractors' Pollution Liability Insurance from the date of commencement of the *Work* until one year after the date of *Ready-for-Takeover*.

.9 Commercial General liability insurance in the name of the *Contractor* and include, or in the case of a single, blanket policy, be endorsed to name, the *Owner* and the *Consultant* as additional insureds but only with respect to liability, other than legal liability arising out of their sole negligence, arising out of the operations of the *Contractor* with regard to the *Work*. Commercial General liability insurance shall be maintained from the date of commencement of the *Work* until one year from the date of *Ready-for-Takeover*. Liability coverage shall be provided for completed operations hazards from the date of *Ready-for-Takeover*, as set out in the certificate of *Ready-for-Takeover*, on an ongoing basis for a period of 6 years following *Ready-for-Takeover*."

(3) **Where the original *Contract Price* stipulated in the Agreement is greater than $25,000,000:** Delete paragraph 11.1.1 and replace it with the following:

"11.1.1 The *Contractor* shall provide, maintain and pay for insurance coverages as stipulated by the *Owner* in writing prior to commencement of the *Work*. Where no written direction in respect of insurance coverages is provided by the *Owner* prior to commencement of the *Work* then the insurance requirements for projects with an original *Contract Price* greater than $5,000,000 and equal to or less than $25,000,000 shall apply notwithstanding that the *Contact Price* is greater than $25,000,000."

SC-111 In all instances and for all *Contract Prices*, delete paragraphs 11.1.6, 11.1.7 and 11.1.8 in their entirety.

GC 11.2 CONTRACT SECURITY

SC-112 Add new GC 11.2 CONTRACT SECURITY as follows:

"**GC 11.2 CONTRACT SECURITY**

11.2.1 *Contactor* shall provide security and bonding if and as stipulated in the *Contract Documents*. Without limiting the foregoing, where the *Contract Price* as of the *Effective Date* is $500,000 or more, bonds will be provided by the *Contractor* as required by the *Construction Act*, the coverage limit of which shall include *Value Added Taxes* as stipulated in paragraph 4.2 of Article A-4."

GC 12.1 READY-FOR-TAKEOVER

SC-113 Amend subparagraph 12.1.1.2 by adding the following to the end:

"and, where possible, evidence of certification by all permit-issuing authorities, indicating approval of all permitted installations."

SC-114 Amend subparagraph 12.1.1.3 by adding the words "has been completed by the *Contractor*" at the end.

SC-115 Amend subparagraph 12.1.1.4 by deleting the word "immediate".

SC-116 Amend subparagraph 12.1.1.6 by adding the words "and commissioning" after the word "testing".

SC-117 In subparagraph 12.1.1.8 delete the word "scheduled" and replace it with the word "completed" and delete the words ", acting reasonably".

SC-118 In paragraph 12.1.4 delete the words "10 calendar days" and replace them with the words "10 *Working Days*".

GC 12.2 EARLY OCCUPANCY BY THE OWNER

SC-119 Delete subparagraphs 12.2.3.2 and 12.2.3.3 in their entirety and replace them as follows:

".2 The *Owner* shall, at any and all times, have the right to enter, occupy and use the *Work* in whole or in part before completion of the *Contract*. Such entry, occupation or use shall not be considered as acceptance of the *Work* nor in any way relieve or limit the responsibilities and liabilities of the *Contractor* under the *Contract* nor affect the warranty period.

.3 For certainty, and notwithstanding occupancy by the *Owner* of a part or entirety of the *Work* before *Ready-for-Takeover* has been attained:

.1 the *Contractor* shall continue to be liable for the care of such part or entirety of the *Work* except that the *Owner* shall become responsible for preventative maintenance and shall be liable for any loss or damage caused by its negligence or fault; and

.2 the warranty period shall be as set out in paragraph 12.3.1 of GC 12.3 – WARRANTY."

SC-120 Delete paragraph 12.2.4 in its entirety and replace it with the following:

"12.2.4 Without limiting paragraph 12.2.3, the *Contractor* shall not unreasonably interfere with such use or operation of the *Work* and *Project* by the *Owner*. The *Contractor*, in completing its obligations under the *Contract*, shall, at its own cost, take all reasonable measures to minimize the effect thereof on such use or operation."

GC 12.3 WARRANTY

SC-121 Delete paragraph 12.3.1 and replace it with the following:

"12.3.1 The warranty period under the *Contract* is:

.1 one year from the date when *Ready-for-Takeover* has been achieved or the date of termination of the *Contract* or the *Contractor*'s right to continue with the *Work*; or

.2 such longer warranty period established in the *Contract Documents* for extended warranties,

(the "***Warranty Period***")."

SC-122 Amend paragraphs 12.3.3 and 12.3.6 by deleting the words "one year warranty period" wherever they appear and replace them with the words "*Warranty Period*".

SC-123 Delete paragraph 12.3.4 in its entirety and replace with the following:

"12.3.4 Subject to paragraph 12.3.2, within 15 *Working Days* of receipt of *Notice in Writing* pursuant to paragraph 12.3.3 (or within such other reasonable time as determined by the *Consultant*) the *Contractor* shall correct, at the *Contractor*'s expense, any defects or deficiencies in the *Work* which appear prior to and during the *Warranty Period* and shall complete such correction as expeditiously as possible, except that where the deficiency prevents maintaining security at the *Place of the Work* or prevents continued operation or functionality of systems essential to the ongoing business or operations of any *Owner Entities* as determined at the sole discretion of the *Owner*, all necessary corrections and/or installations of temporary replacements shall be carried out immediately as an emergency service. Should the *Contractor* fail to provide this emergency service within 48 hours of a request being made during the normal business hours of the *Contractor*, the *Owner* shall be authorized to carry out all necessary repairs or replacements at the *Contractor*'s expense and deduct all costs of so doing from the *Warranty Security* and, if required, otherwise recover all costs of so doing as a debt due and payable by the *Contractor* upon demand. No such action by the *Owner* shall waive or release the *Contractor* of its obligations under this *Contract*, including any warranty obligations."

SC-124 Delete paragraph 12.3.5 and replace it with the following:

"12.3.5 The *Contractor* shall correct or pay for damage resulting from corrections made under the requirements of this GC 12.3. If the *Contractor* fails to correct defects or deficiencies in the *Work* or other damage resulting from such corrections within 15 *Working Days* after receiving written notification of the defect or deficiency or damage from the *Owner* or the *Consultant*, the *Owner* may (whether itself or through others) make such corrections at the Contractor's expense and deduct all costs of so doing from the *Warranty Security* and, if required, otherwise recover all costs of so doing as a debt due and payable by the *Contractor* upon demand."

SC-125 Add new paragraphs 12.3.7 to 12.3.9 as follows:

"12.3.7 Where manufacturers offer, as a general policy, extended warranties on their *Products* or other greater benefits than those called for in the specifications, the *Contractor* shall obtain the benefit of such extended warranties for the *Owner*. The *Contractor* shall ensure that all warranties, guarantees or other obligations for *Work* or *Products* performed or supplied by any *Contractor Personnel* in connection with the *Work* are obtained and available for the direct benefit of the *Owner*. In the alternative, the *Contractor* shall assign to the *Owner* all warranties, guarantees or other obligations for *Work* or *Products* performed or supplied by any *Contractor Personnel* and such assignment shall be with the consent of the assigning party, where required by law, or by the terms of that *Person*'s contract. Such assignment shall be in addition to, and shall in no way limit, the warranty rights of the *Owner* under the *Contract Documents*.

12.3.8 To ensure performance of the *Contractor*'s obligations as set out in GC 12.3 – WARRANTY, the *Owner* shall not make payment to the *Contractor* of the *Warranty Security* until the following has occurred, as confirmed by the *Consultant* in writing:

.1 expiry of the *Warranty Period*; and

.2 correction by the *Contractor* of all defects and deficiencies in the *Work* which occurred or arose prior to and during the *Warranty Period*.

12.3.9 Specified warranty periods shall not be construed as limiting the provisions of GC 13.1 –INDEMNIFICATION. Payment of holdback amounts and final payment shall not relieve the *Contractor*'s responsibility for correction of any other deficiencies or incomplete items, at no additional cost to the *Owner* pursuant to this GC12.3 – WARRANTY."

GC 13.1 INDEMNIFICATION

SC-126 Delete paragraph 13.1.1 and replace it with the following :

"13.1.1 The *Contractor* shall indemnify and save harmless the *Owner Entities* from and against any and all *Claims* arising out of the negligence, errors, omissions, fraud or willful misconduct of the *Contractor Personnel* attributable to or connected with the *Contractor*'s performance or non-performance of its obligations pursuant to this *Contract* except to the extent that such *Claims* are attributable or caused by the negligence of the *Owner Entities* or any of them. This indemnity shall survive the expiration or earlier termination of this *Contract* and continue in full force and effect."

SC-127 In paragraph 13.1.2 delete the words "The obligation of either party to indemnify as set forth in paragraph 13.1.1" and replace them with the words "The liability of either party under this *Contract*".

SC-128 In subparagraph 13.1.2.1 delete the words "the minimum liability insurance limit for one occurrence, of the applicable insurance policy, as referred to in CCDC 41 in effect at the time of bid closing" and replace them with the words "the amount of the minimum insurance limit for one occurrence, of the applicable insurance policy, as set forth in Appendix 3 to the Supplementary Conditions for each policy of insurance required to be provided by such party".

SC-129 Add the following to the end of subparagraph 13.1.2.1:

"For certainty, each party's liability for losses suffered by the other party for which insurance is to be provided by them pursuant to GC 11.1 – INSURANCE (as modified by the Supplementary Conditions) shall not be less in the aggregate than the total amounts of the minimum insurance limits for one occurrence for each policy of insurance as stipulated in GC 11.1 – INSURANCE (as modified by the Supplementary Conditions) as is applicable to the subject *Claims*."

SC-130 In subparagraph 13.1.2.3 delete the words "and neither party shall have any liability to the other for indirect, consequential, punitive or exemplary damages".

SC-131 Add new paragraphs 13.1.7 to 13.1.11 as follows:

"13.1.7 The *Owner Entities* shall have no liability under this *Contract* or in respect of the *Work* or the *Project* for any *Consequential Damages*.

13.1.8 Without limiting the foregoing, within 10 calendar days of the *Contractor* receiving notice or otherwise becoming aware of a *Claim* initiated by a third party against an *Owner Entity* and/or the *Contractor* in respect of a matter for which the *Contractor* has indemnified the Owner *Entities* under this *Contract* and where such *Claim* has been referred to a legal proceeding or other dispute resolution proceeding, the *Contractor* shall retain legal representation and confirm in writing to the *Owner* that it shall assume the *Owner Entities*' defence in accordance with the indemnification provisions outlined in this *Contract*, including this GC 13.1 – INDEMNIFICATION. For certainty, for the purposes of this GC 13.1 – INDEMNIFICATION "third party" shall not include any *Subcontractor*, *Supplier*, *Other Contractor* or other person or entity engaged for the *Project*.

13.1.9 Where the *Contractor* receives notice or otherwise becomes aware of a *Claim* initiated by a third party against an *Owner Entity* and/or the *Contractor* in respect of a matter for which the *Contractor* has indemnified the *Owner Entities* under this *Contract* and where such *Claim* has not been referred to a legal proceeding or other dispute resolution proceeding, if the *Contractor* denies liability and does not assume responsibility for payment of such *Claim* the *Contractor* will notify the *Owner* and third party claimant in writing of its decision within 20 calendar days of receiving notice or otherwise becoming aware of the *Claim*, and the *Owner* reserves the right to assign the *Claim* to an independent insurance adjuster for investigation and determination. The *Owner* and *Contractor* shall fully cooperate with the adjuster to achieve timely resolution of such *Claim*. The *Contractor* and the *Owner* shall provide the adjuster with access to any and all records or documentation in relation to the *Work* and obligations performed under the *Contract* as required for the adjuster's determination. The *Owner* and the *Contractor* acknowledge that all *Claims* will be investigated and responded to by the adjuster within 45 calendar days of receipt of the *Claim* or within such other time as may be agreed by the parties.

13.1.10 The *Owner* and the *Contractor* shall be bound by the final decision of the independent adjuster who shall notify the claimant in writing of the final decision with respect to the adjustment of the *Claim*. The *Owner* shall reserve the right to communicate to the third party claimant the final decision with respect to the adjustment of the *Claim*. Where liability is found on the part of the *Contractor*, the adjuster shall handle settlement negotiations and all pertaining financial and legal transactions on behalf of the *Owner* and the *Contractor*, including but not limited to securing a full and final release and issuing the settlement funds to the third party claimant.

13.1.11 To the extent the adjuster determines the *Contractor* to be liable for the *Claim* under this *Contract* or at law, all costs for adjuster fees, claim administration and settlement costs will be borne by the *Contractor*. To the extent the *Contractor* is found not to be liable for the *Claim* under this *Contract* or at law, the *Owner* will bear all costs for adjuster fees, claim administration and settlement costs.

13.1.12 For certainty, where any *Claim* has been referred to a legal proceeding or other dispute resolution proceeding paragraphs 13.1.8 will apply (and paragraphs 13.1.9 to 13.1.11 shall not apply) and the *Contractor* may advance any denial of liability in the normal course of such proceedings."

GC 14.1 CONSTRUCTION LIENS

GC 15.1 OWNERSHIP AND CONFIDENTIALITY

GC 16.1 FREEDOM OF INFORMATION

SC-132 Add the following new GC 14.1 CONSTRUCTION LIENS, GC 15.1 OWNERSHIP AND CONFIDENTIALITY and GC 16.1 FREEDOM OF INFORMATION:

"**GC 14.1 CONSTRUCTION LIENS**

14.1.1 In the event that a lien arising from the performance of the *Work* is registered against the *Place of the Work* or *Project* or the *Owner Entities*' interest in the *Place of the Work* or *Project*, the *Contractor* shall, within seven (7) calendar days, at its sole expense, vacate or discharge the lien from title to the *Place of the Work*. If the lien is merely vacated, the *Contractor* shall, if requested, undertake the *Owner Entities'* defence of any subsequent lawsuit commenced in respect of the lien at the *Contractor's* sole expense. The *Owner Entities* shall have the right to be represented by advisory counsel and other professionals, at its own expense, and shall be kept fully informed by the *Contractor* of the proceeding at all stages thereof whether or not so represented.

14.1.2 If the *Contractor* fails or refuses to vacate or discharge a construction lien within the time prescribed above, the *Owner* shall, at its option, be entitled to take all steps necessary to vacate and/or discharge the lien, and all costs incurred by the *Owner Entities* in so doing (including legal fees on a solicitor and client basis and any payment which may ultimately be made out of or pursuant to security posted to vacate the lien) shall be for the account of the *Contractor*, and the *Owner* may deduct such amounts from any amounts otherwise due or owing to the *Contractor*. If the *Owner* vacates the lien, it shall be entitled to retain all amounts it would be required to retain pursuant to the *Payment Legislation* if the lien had not been vacated.

14.1.3 Without limiting the generality of the foregoing, the *Contractor* shall indemnify the *Owner* Entities for all costs (including legal fees on a solicitor and client basis) they may occur in connection with the claim of lien or subsequent lawsuit brought in connection with the lien, or in connection with any other claim or lawsuit brought against the *Owner Entities* by any *Contractor Personnel*.

14.1.4 This GC 14.1 – CONSTRUCTION LIENS does not apply to liens filed by *Contractor* Personnel that are claimed as a result of any default by the *Owner* to make payments to the *Contractor* in accordance with the terms of the *Contract*.

GC 15.1 OWNERSHIP AND CONFIDENTIALITY

15.1.1 Subject to and without limiting paragraph 3.7.5, all *Work*, including all *Products* and all portions thereof, shall be the property of the *Owner*.

15.1.2 The *Contractor* grants to the *Owner* an irrevocable, perpetual, worldwide, and exclusive royalty-free license to use the *Deliverables*, including all *Contractor IP* therein, for the *Project*, including: (i) for completion of the *Project* and *Work* in the event of early termination of the *Contract*; and (ii) for the future repair, use, occupancy, expansion, operation, maintenance, and/or modification to the *Project* and *Work*. The licence shall be assignable and transferable by the *Owner* to any *Affiliate* and to any purchaser of all or part of the *Place of the Work* or *Project* provided that such *Person* assumes and agrees in writing to all limitations of use set out herein. The *Owner* may use the *Deliverables* for the purposes provided in this paragraph 15.1.2 whether or not this *Contract* is terminated, provided only that the *Owner* pays the compensation due and owing to the *Contractor* pursuant to this *Contract*. The *Deliverables* may not be reproduced for use for other projects by either party without the express written permission of the other party. The *Contractor* shall ensure that all moral rights to the *Deliverables* have been waived, including by all Contractor *Personnel*. Copies of all *Deliverables* shall be handed over by the *Contractor* to the *Owner* upon the earlier of termination of this *Contract* and submission of the *Contractor*'s *Proper Invoice* for final payment. The *Contractor* agrees to obtain such rights from all *Contractor Personnel* as required so that the *Contractor* can grant the above-noted license.

15.1.3 The *Contractor* shall not, without the *Owner*'s prior written consent, release or disclose any *Confidential Information* to anyone except as necessary to perform the *Work* and its obligations under this *Contract*, and then, only where the *Person* receiving such information is bound by an obligation of confidentiality consistent with this *Contract*. If any *Contractor Personnel* is required to disclose Confidential Information under a valid order of a *Governmental Authority*, the *Contractor* shall: (i) provide the *Owner* with immediate written notice of any request for disclosure; (ii) cooperate with the *Owner* in its efforts to resist or minimize the *Confidential Information* required to be disclosed; and (iii) take such steps as are reasonably necessary and available to maintain the confidentiality of the information by the *Contractor*.

15.1.4 The *Contractor* acknowledges that disclosure or use of the *Confidential Information* in violation of this *Contract* could cause irreparable harm to the *Owner* for which monetary damages may be difficult to ascertain or be an inadequate remedy. The *Contractor* therefore agrees that the *Owner* shall have the right, in addition to its other rights and remedies, to seek injunctive relief for any violation of its confidentiality obligations under this GC 15.1 – OWNERSHIP AND CONFIDENTIALITY.

15.1.5 This GC 15.1 – OWNERSHIP AND CONFIDENTIALITY shall survive the completion of the *Work* or the termination of the *Contract* for any reason whatsoever.

GC 16.1 FREEDOM OF INFORMATION & DISCLOSURE

16.1.1 Without limiting the foregoing, the *Owner* represents to *Contractor*, and *Contractor* acknowledges, that the *Owner Entities* are bound by *MFIPPA* and that the law might compel the *Owner Entities* to disclose certain *Confidential Information*. The *Owner Entities* are not required to take steps to oppose or prevent, or assist the *Contractor* in opposing or preventing, any disclosure of information, including *Confidential Information*, which, in the opinion of the *Owner Entities'* counsel, is legally required to be disclosed. *Contractor* shall assist and comply with any notice provided under *MFIPPA* respecting an access request that the *Owner* has received, including providing records and information to the *Owner* that the *Owner* deems to be within its control for the purposes of this *Contract*. If *Contractor* is legally compelled to disclose *Confidential Information*, for example through court order, warrant, or under applicable legislation, *Contractor* shall promptly notify the *Owner* prior to disclosure of any such *Confidential Information* so that the *Owner Entities* have an opportunity, in their sole discretion, to oppose disclosure through any available processes."

[END OF SUPPLEMENTARY CONDITIONS. APPENDICES FOLLOW.]

APPENDIX 1 TO THE SUPPLEMENTARY CONDITIONS
AGREEMENT TERM SHEET

Supplementary Condition	Contract Clause	Description	Term
SC-1	Paragraph 1.3 of Article A-1	*Ready-for-Takeover Date*	November 1, 2025
SC-1	Paragraph 1.3 of Article A-1	*Completion Date*	November 8, 2025
SC-3	Paragraph 4.6 of Article A-4	Percentage of the total amount claimed in each *Proper Invoice* to be retained by *Owner* as *Warranty Security*	2.5
SC-3	Paragraph 4.7 of Article A-4	Amount of liquidated damages per day for each day or part day of delay until *Ready-for-Takeover* is achieved	$250
SC-12	Definitions	*Owner's Agent*	N/A
SC-41	Paragraph 5.1.4 of GC 5.1	Email address(es) for submission of all draft applications for payment and *Proper Invoices* to *Owner* and *Consultant*	jon.chiarot@halton.ca dfinn@finnprojects.com
SC-52	Paragraph 5.4.6	Owner election to release holdback on an annual basis	N/A
SC-52	Paragraph 5.4.7	Owner election to release holdback on phased basis	N/A
N/A	N/A	Where *Contract Price* is less than $250K, does *Owner* elect not to take the statutory 10% holdback?	N/A

APPENDIX 2 TO THE SUPPLEMENTARY CONDITIONS
PROPER INVOICE REQUIREMENTS

Each *Proper Invoice* submitted by the *Contractor* shall be in the form set out in Exhibit A to this Appendix 2 include the following:

- The *Contractor*'s name and address;
- The date of the *Proper Invoice*;
- The period during which the services, products or materials were supplied;
- Identification of the *Contract* and any applicable *Change Order* (being the authority under which the subject work, services, products or materials were supplied);
- A description of the subject work, services, products or materials supplied (including quantity where appropriate);
- The amount payable for the subject work, services, products or materials supplied and the payment terms;
- The name, title, telephone number and mailing address of the person to whom payment is to be sent;
- A statement based on the schedule of values submitted pursuant to paragraph 5.2.4;
- A copy of the current *Construction Schedule* and of any look-ahead schedule required by the *Contract Documents*;
- A copy of the *Contractor*'s current and up-to-date certificate of insurance evidencing compliance with GC 11.1.
- Where payment is requested for *Products* delivered to the *Place of the Work* but not yet incorporated into the *Work*, evidence as reasonably required by the *Consultant* to establish the value and delivery of such *Products*;
- Where payment for *Products* prior to their delivery to the *Place of the Work* is approved by the Owner pursuant to paragraph 3.7.7, evidence as the *Consultant* and *Owner* may reasonably require to establish (i) the value of such *Products*; (ii) compliance with paragraph 3.7.8; and (iii) that such *Products* have been ordered by the *Contractor* for the *Project* and are being manufactured, transported or stored prior to their delivery to the *Place of the Work*;
- All documentation required pursuant to GC 10.4 – WORKERS' COMPENSATION, including a clearance certificate from the *WSIB* stating that all amounts owed to date have been paid in full;

- For each *Proper Invoice* submitted after the first, a statutory declaration using the latest CCDC 9A form of "Statutory Declaration of Progress Payment Distribution by Contractor";

- For a *Proper Invoice* submitted in respect of final payment:

    - copies of all *Deliverables*, including as-built drawings, and copies of all warranties, guarantees and operation and maintenance manuals related to the *Work*, in hard copy and electronic format as requested by the *Owner;* and

    - an executed final waiver and release in the form attached as Exhibit B to this Appendix 2.

- Any other supporting documents required by the *Contract Documents*.

[***Exhibits A and B to this Appendix 2 follow***]

EXHIBIT A TO APPENDIX 2 TO THE SUPPLEMENTARY CONDITIONS
PROPER INVOICE TEMPLATE

See attached.

EXHIBIT A
PROPER INVOICE TEMPLATE

INVOICE TEMPLATE

Draft Invoice ☐	**Date:**	*Insert date draft invoice sent to owner*	
Proper Invoice ☐	**Date:**	*Insert date proper invoice sent to owner*	
Payment due Date	*Insert date payment due to the contractor*		
Owner	*Insert owner's name*		
Address	*Insert owner's address*		
Project Manager	*Insert owner's project manager's name*		
Contract Title	*Insert title*		
Contract Number	*Insert number*		
Purchase Order Number	*Insert number*		
Payment Certificate No.	*Insert number*		
Work Completed From	*Insert period start date*		
To	*Insert period end date*		
Contractor	*Insert contractor's legal name*		
Contractor's Address	*Insert contractor's address*		
Remit Payment To Address	*Insert remittance address if different from contractor's address*		
Project Manager	*Insert contractor's project manager's name*		
Contact Info	*Insert phone number and email*		
HST Registration No.	*Insert number*		
Consultant	*Insert consultant's name*		
Contract Administrator	*Insert consultant's contract administrator's name*		
Contract Value (excl. HST) (1)	*Insert current contract value including contingency*		
Contingency Allowance (2)	*Insert current contingency allowance*		
Approved Change Orders (3)	*Insert value of total approved change orders*		
Revised Total Contract Value (4)	*(1) - (2) + (3)*		
Estimated %age of Work Performed	*(Gross payment to date) / (4)*		
Contingency Unallocated	*(2) - (3)*		

	To Date	**Previous**	**Current**
Value of Work Performed (excl. Change Orders)	$ -	$ -	$ -
Value of Change Orders Performed	-	-	-
Gross Payment	$ -	$ -	$ -
Less Statutory Holdback (10%)	-	-	-
Release of Statutory Holdback (10%)	-	-	-
Less Finishing Holdback (10%)	-	-	-
Release of Finishing Holdback (10%)	-	-	-
Less Warranty Security	-	-	-
Release of Warranty Security	-	-	-
Less Other Retainers	-	-	-
Release of Other Retainers	-	-	-
Total Net Payment	$ -	$ -	$ -
HST (13%)			-
Less Liquidated Damages	-	-	-
Total Recommended Payment			$ -

Attachments submitted with this invoice

- ☐ Statutory Declaration
- ☐ Progress and Look Ahead Work Schedules per Contract
- ☐ WSIB
- ☐ Certificate of Insurance
- ☐ Tender Price Breakdown/Schedule of Values
- ☐ Other _____

Approved by Contractor

Print Name _____

Signature _____

Date _____

EXHIBIT B TO APPENDIX 2 TO THE SUPPLEMENTARY CONDITIONS
FORM OF FINAL WAIVER AND RELEASE

TO: [**OWNER NAME AND ADDRESS**] ("***Owner***")

FROM: [**CONTRACTOR NAME AND ADDRESS**] ("***Contractor***")

DATE OF APPLICATION
FOR FINAL PAYMENT: [●]

RE: CCDC 2 – 2020 Stipulated Price Contract dated [●] (the "**Contract**")

Except for *Claims* for which *Notice in Writing* has been received by the *Owner* from the *Contractor* prior to the date of the *Contractor*'s application for final payment under the *Contract* (including all such *Claims* listed herein) or *Claims* which the *Contractor* could not reasonably have knowledge of on such date (including the *Contractor*'s claim for any amounts expressly held back by the *Owner* under the *Contract*, including in respect of any unpaid *Warranty Security*), the *Contractor* acknowledges and agrees that:

1. the *Contractor* does not have and will not make any *Claim* for additional compensation under the *Contract*, including without limitation for extras, changes or delays, or any other *Claim* whatsoever against the *Owner Entities* in connection with the *Contract*, the *Project*, or the *Work*;

2. the final payment made by the *Owner* shall be received by the *Contractor* in full and final settlement of the balance due to the *Contractor* under the *Contract* and of any and all *Claims* of the *Contractor* in connection with the *Contract* (except only for the *Contractor*'s claim for any amounts expressly held back by the *Owner* under the *Contract*, including in respect of any unpaid *Warranty Security*); and

3. the *Contractor* gives receipt of full discharge and waives its rights to any and all *Claims* not submitted as of the date of its application for final payment under the *Contract*.

As of the date of this Waiver and Release the *Contractor* has given the *Owner Notice in Writing* of the following *Claims*:

1. [LIST TO BE COMPLETED BY CONTRACTOR]

For certainty, all terms not defined herein shall have the meaning given in the *Contract*.

[**CONTRACTOR NAME**]

_____
I/we have authority to bind the company

_____
I/we have authority to bind the company

APPENDIX 3 TO THE SUPPLEMENTARY CONDITIONS
INSURANCE

Where the original *Contract Price* stipulated in the Agreement is equal to or less than $5,000,000 the following shall apply:

1. Commercial General liability insurance shall be with limits of not less than $5,000,000 per occurrence, an aggregate limit of not less than $5,000,000 within any policy year with respect to completed operations, and a deductible not exceeding $10,000. The insurance coverage shall not be less than the insurance provided by IBC Form 2100 (including an extension for a standard provincial and territorial form of non-owned automobile liability policy) and IBC Form 2320. To achieve the desired limit, umbrella or excess liability insurance may be used. Subject to satisfactory proof of financial capability by the *Contractor*, the *Owner* may agree to increase the deductible amounts.

2. Automobile liability insurance in respect of vehicles that are required by law to be insured under a contract by a Motor Vehicle Liability Policy, shall have limits of not less than $5,000,000 inclusive per occurrence for bodily injury, death and damage to property, covering all vehicles owned or leased by the *Contractor*. Where the policy has been issued pursuant to a government-operated automobile insurance system, the *Contractor* shall provide the *Owner* with confirmation of automobile insurance coverage for all automobiles registered in the name of the *Contractor*.

3. Manned Aircraft and watercraft liability insurance with respect to owned or non-owned aircraft and watercraft (if used directly or indirectly in the performance of the *Work*), including use of additional premises, shall have limits of not less than $10,000,000 inclusive per occurrence for bodily injury, death and damage to property including loss of use thereof and limits of not less than $10,000,000 for aircraft passenger hazard. Such insurance shall be in a form acceptable to the *Owner*.

4. Unmanned aerial vehicle liability insurance with respect to owned or non-owned aircraft (if used directly or indirectly in the performance of the Work), shall have limits of not less than $5,000,000 per occurrence or accident for bodily injury, death and damage to property or such amounts as required by any applicable law or regulation.

5. "Broad form Builders Risk" property insurance shall have limits of not less than the sum of 1.1 times *Contract Price* and the full value, as stated in the *Contract*, of *Products* and design services that are specified to be provided by the *Owner* for incorporation into the *Work*, with a deductible not exceeding $10,000. The insurance coverage shall not be less than the insurance provided by IBC Forms 4042 and 4047 or their equivalent replacement. Subject to satisfactory proof of financial capability by the *Contractor*, the *Owner* may agree to increase the deductible amounts.

6. Boiler and machinery insurance shall have limits of not less than the replacement value of the permanent or temporary boilers and pressure vessels, and other insurable objects forming part of the *Work*. The insurance coverage shall not be less than the insurance

provided by a comprehensive boiler and machinery policy including hot testing and commissioning.

7. Contractors' equipment insurance coverage written on an "all risks" basis covering *Construction* Equipment used by the *Contractor* for the performance of the *Work*, shall be in a form acceptable to the *Owner* and shall not allow subrogation claims by the insurer against the *Owner*. Subject to satisfactory proof of financial capability by the *Contractor* for self-insurance, the *Owner* may agree to waive the equipment insurance requirement.

8. Contractors' Pollution liability insurance shall have limits of not less than $5,000,000 per occurrence for bodily injury, death and damage to property, with a deductible not exceeding $25,000.

Where the original *Contract Price* stipulated in the Agreement is greater than $5,000,000 and equal to or less than $25,000,000 the following shall apply:

1. Commercial General liability insurance shall be with limits of not less than $10,000,000 per occurrence, an aggregate limit of not less than $10,000,000 within any policy year with respect to completed operations, and a deductible not exceeding $10,000. The insurance coverage shall not be less than the insurance provided by IBC Form 2100 (including an extension for a standard provincial and territorial form of non-owned automobile liability policy) and IBC Form 2320. To achieve the desired limit, umbrella or excess liability insurance may be used. Subject to satisfactory proof of financial capability by the *Contractor*, the *Owner* may agree to increase the deductible amounts.

2. Wrap-up liability insurance shall be with limits of not less than $10,000,000 per occurrence, an aggregate limit of not less than $10,000,000 within any policy year with respect to completed operations, and a deductible not exceeding $100,000. The insurance coverage shall not be less than the insurance provided by IBC Form 2100 (including an extension for a standard provincial and territorial form of non-owned automobile liability policy) and IBC Form 2320. To achieve the desired limit, umbrella or excess liability insurance may be used. Subject to satisfactory proof of financial capability by the *Contractor*, the *Owner* may agree to increase the deductible amounts.

3. Automobile liability insurance in respect of vehicles that are required by law to be insured under a contract by a Motor Vehicle Liability Policy, shall have limits of not less than $10,000,000 inclusive per occurrence for bodily injury, death and damage to property, covering all vehicles owned or leased by the *Contractor*. Where the policy has been issued pursuant to a government-operated automobile insurance system, the *Contractor* shall provide the *Owner* with confirmation of automobile insurance coverage for all automobiles registered in the name of the *Contractor*.

4. Manned Aircraft and watercraft liability insurance with respect to owned or non-owned aircraft and watercraft (if used directly or indirectly in the performance of the *Work*), including use of additional premises, shall have limits of not less than $10,000,000 inclusive per occurrence for bodily injury, death and damage to property including loss of

use thereof and limits of not less than $10,000,000 for aircraft passenger hazard. Such insurance shall be in a form acceptable to the *Owner*.

5. Unmanned aerial vehicle liability insurance with respect to owned or non-owned aircraft (if used directly or indirectly in the performance of the Work), shall have limits of not less than $5,000,000 per occurrence or accident for bodily injury, death and damage to property or such amounts as required by any applicable law or regulation.

6. "Broad form Builders Risk" property insurance shall have limits of not less than the sum of 1.1 times *Contract Price* and the full value, as stated in the *Contract*, of *Products* and design services that are specified to be provided by the *Owner* for incorporation into the *Work*, with a deductible not exceeding $100,000. The insurance coverage shall not be less than the insurance provided by IBC Forms 4042 and 4047 or their equivalent replacement. Subject to satisfactory proof of financial capability by the *Contractor*, the *Owner* may agree to increase the deductible amounts.

7. Boiler and machinery insurance shall have limits of not less than the replacement value of the permanent or temporary boilers and pressure vessels, and other insurable objects forming part of the *Work*. The insurance coverage shall not be less than the insurance provided by a comprehensive boiler and machinery policy including hot testing and commissioning.

8. Contractors' equipment insurance coverage written on an "all risks" basis covering *Construction Equipment* used by the *Contractor* for the performance of the *Work*, shall be in a form acceptable to the *Owner* and shall not allow subrogation claims by the insurer against the *Owner*. Subject to satisfactory proof of financial capability by the *Contractor* for self-insurance, the *Owner* may agree to waive the equipment insurance requirement.

9. Project Specific Contractors' Pollution liability insurance shall have limits of not less than $10,000,000 per occurrence for bodily injury, death and damage to property, with a deductible not exceeding $25,000.

[*End of Appendix 3*]

SECTION 4: FORMS

NEW / CHANGE VENDOR AND ELECTRONIC FUNDS TRANSFER APPLICATION

SECTION A -PLEASE TYPE DEPARTMENT INFORMATION (TO BE COMPLETED BY HALTON REGION)

Requested by:		Department:	
Extension:	Date:	Date of Request:	

SECTION B - PLEASE TYPE VENDOR INFORMATION (TO BE COMPLETED BY HALTON REGION AND / OR VENDOR)

New ☐ Change ☐			***Vendor Number:***		
Vendor Legal Name:			***Remit to, if different:***		
Address:			***Address/ PO Box Number:***		
City, Province/ State:		Postal Code/Zip Code:	***City, Prov/ State:***		***Postal Code/Zip Code:***
Vendor Telephone:					

Sales Rep. contact name and phone number:	
Accounts Receivables contact name and phone No.:	
Accounts Receivables contact	**EMAIL ADDRESS:**

HST (XXXXXXXXX RTXXXX) Reg. #: ☐ OR ☐ Not Registered - Circle one: NON-PROFIT, UNDER $30,000, MEMBERSHIP, MEDICAL, DENTAL

Check Applicable Boxes

Is this vendor for Halton ☐ HCHC ☐

Currency Paid In CDN ☐ USD ☐

REGISTERED CHARITY, CHILDCARE, EDUCATION

GOVERNMENT, OR OTHER _____

SECTION C - FOR NEW AND EXISITING VENDORS - BANKING INFORMATION FOR EFT PAYMENTS

Please attach VOID CHEQUE, BANK DEPOSIT SLIP OR EFT CONFIRMATION LETTER FROM YOUR FINANCIAL INSTITUTION

SECTION D - FOR EXISTING VENDORS WITH PRIOR BANKING INFORMATION, required to input PREVIOUS BANK ACCOUNT on this form below:

Name of **PRIOR:** Financial Institution:		
PRIOR: Transit (Branch) Number	**PRIOR:** Instituion No.	**PRIOR:** Account Number

SECTION E - AUTHORIZED SIGNING OFFICER'S AUTHORIZATION: REQUIRES TWO SIGNATURES TO SAFEGUARD YOUR ORGANIZATION

Name:		Name:	
Title:		Title:	
Signature:		Signature:	
Telephone/Ext:		Telephone/Ext:	
Email:		**Email:**	

Vendor Email Address for Payment Remittance: **Email:**

For Payment Remittance Advice, ensure filters are set to allow receipt of email

I/We authorize Halton Region/HCHC to make all payments by EFT into the above bank account.
I/We have the authority to provide the above information and sign on behalf of the corporation/organization/payee.
My/Our authorization is to remain in effect until I/we cancel in writing with the signature of an authorized signing officer.
I/We agree that Halton Region/HCHC will not be liable for any loss occurring after the deposit has been made to the identified bank account.
I/We also agree that any direct deposits received in error will be promptly returned to Halton Region/HCHC.
I/We have attached a void cheque, bank deposit slip or EFT confirmation letter from our Financial Institution.

DATE (MM/DD/YYYY)

<Date>

SAMPLE CERTIFICATE OF INSURANCE

This is to certify that the Policy(ies) of insurance listed below ("Policy" or "Policies") have been issued to the Named Insured identified below for the policy period(s) indicated. This certificate is issued as a matter of information only and confers no rights upon the Certificate Holder named below other than those provided by the Policy(ies).

Notwithstanding any requirement, term, or condition of any contract or any other document with respect to which this certificate may be issued or may pertain, the insurance afforded by the Policy(ies) is subject to all the terms, conditions, and exclusions of such Policy(ies). This certificate does not amend, extend or alter the coverage afforded by the Policy(ies).

Certificate Holder and Address:

The Regional Municipality of Halton
c/o Risk and Insurance Services
1151 Bronte Road
Oakville, ON L6M 3L1

Named Insured and Address:

<Full Legal Name and Address of Named Insured>
NOTE: Named Insured must be identical to the full legal name of the party entering into the Contract/Agreement with the Region.

This certificate is issued regarding:

<Description/Project Name/Agreement/Reference #>

Type(s) of Insurance **NOTE:** must include ALL policies, endorsements, clauses as set out in the Bid Document/Conditions/ Contract/Agreement	Insurer(s)	Policy Number(s)	Policy Effective (MM/DD/YYYY)	Policy Expiry (MM/DD/YYYY)	Sums Insured or Limits of Liability **NOTE:** refer to limits as set out in the Bid Document/Conditions/ Contract/Agreement	
Commercial General Liability • Each Occurrence • Third party bodily injury and property damage • Products and/or completed operations • Personal injury & advertising • Contractual liability • Cross liability and severability of interest • Non-Owned automobile • <*>	<*>	<*>	<*>	<*>	Each Occurrence	$ <*>
					General Aggregate	$ <*>
					Products and/or Completed Ops	$ <*>
					Personal injury & advertising	$ <*>
					Non-Owned Automobile	$ <*>
					<*>	$ <*>
					<*>	$ <*>
					<*>	$ <*>
Automobile Liability • All Owned Automobiles • Leased Automobiles • <*>	<*>	<*>	<*>	<*>	Bodily Injury and Property Damage Combined	$ <*>
					<*>	$ <*>
Excess Liability • Umbrella Form (excess of <*>)	<*>	<*>	<*>	<*>	Each Occurrence	$ <*>
					Aggregate	$ <*>
Other (Specify) • <*>	<*>	<*>	<*>	<*>	<*>	$ <*>
					<*>	$ <*>

Additional Insured:

The Regional Municipality of Halton and **<insert any other Additional Insured parties, where applicable, e.g. Halton Community Housing Corporation and/or local municipality – refer to the requirements as set out in the Bid Document/Conditions/ Contract/Agreement>** is/are added as Additional Insured(s) with respect to Liability arising out of the operations of the Named Insured.

Notice of Cancellation:

Should any of the policies described herein be cancelled before the expiration date thereof, the insurer(s) affording coverage will endeavor to mail 30 days written notice to the Certificate Holder named herein.

Brokerage/Agency:

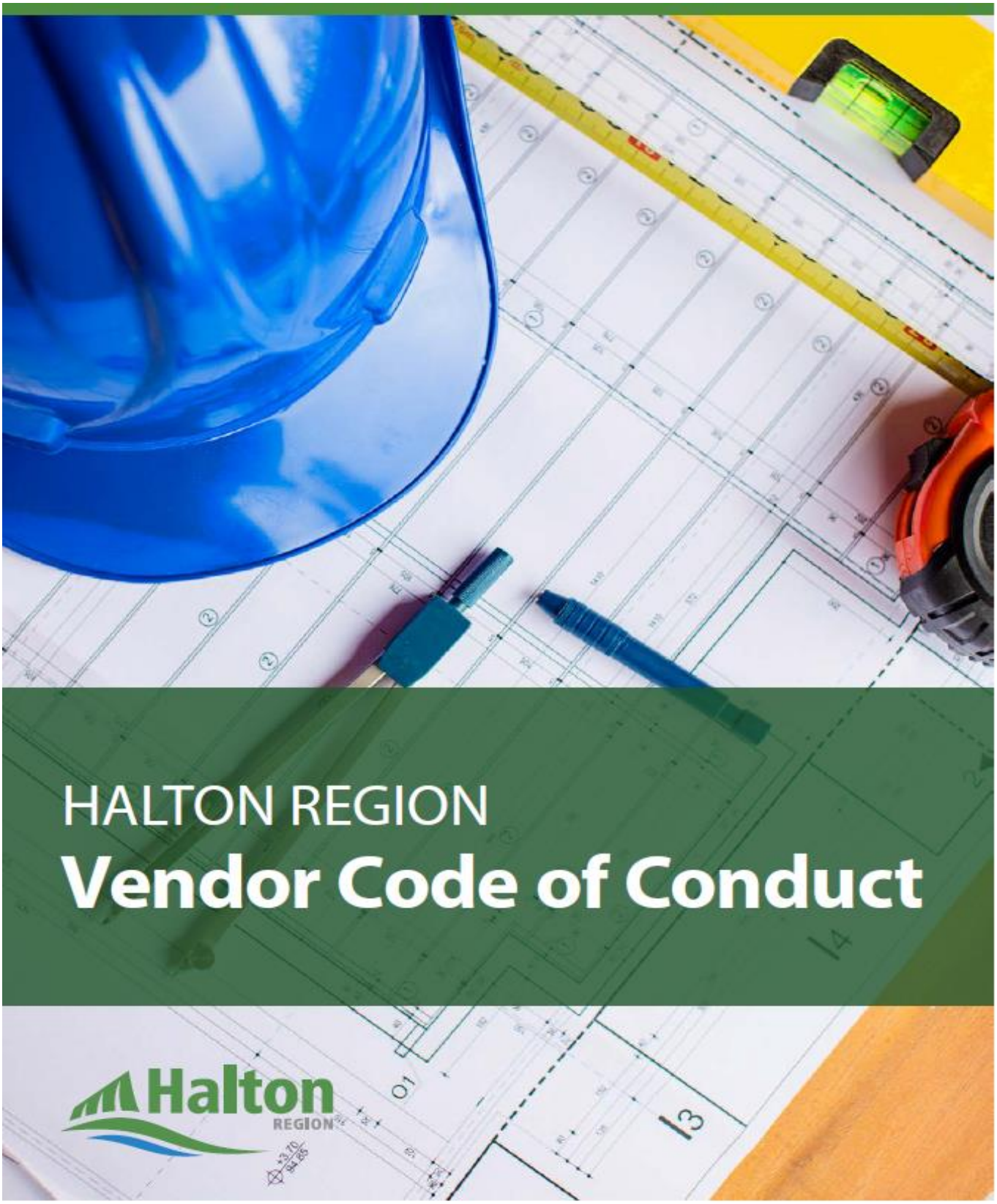
<Name and Address of Authorized Representative>

Authorized Representative:

By: <Signature of Authorized Representative>

<Name>

Halton Region
Vendor Code of Conduct


HALTON REGION
Vendor Code of Conduct
Halton
REGION

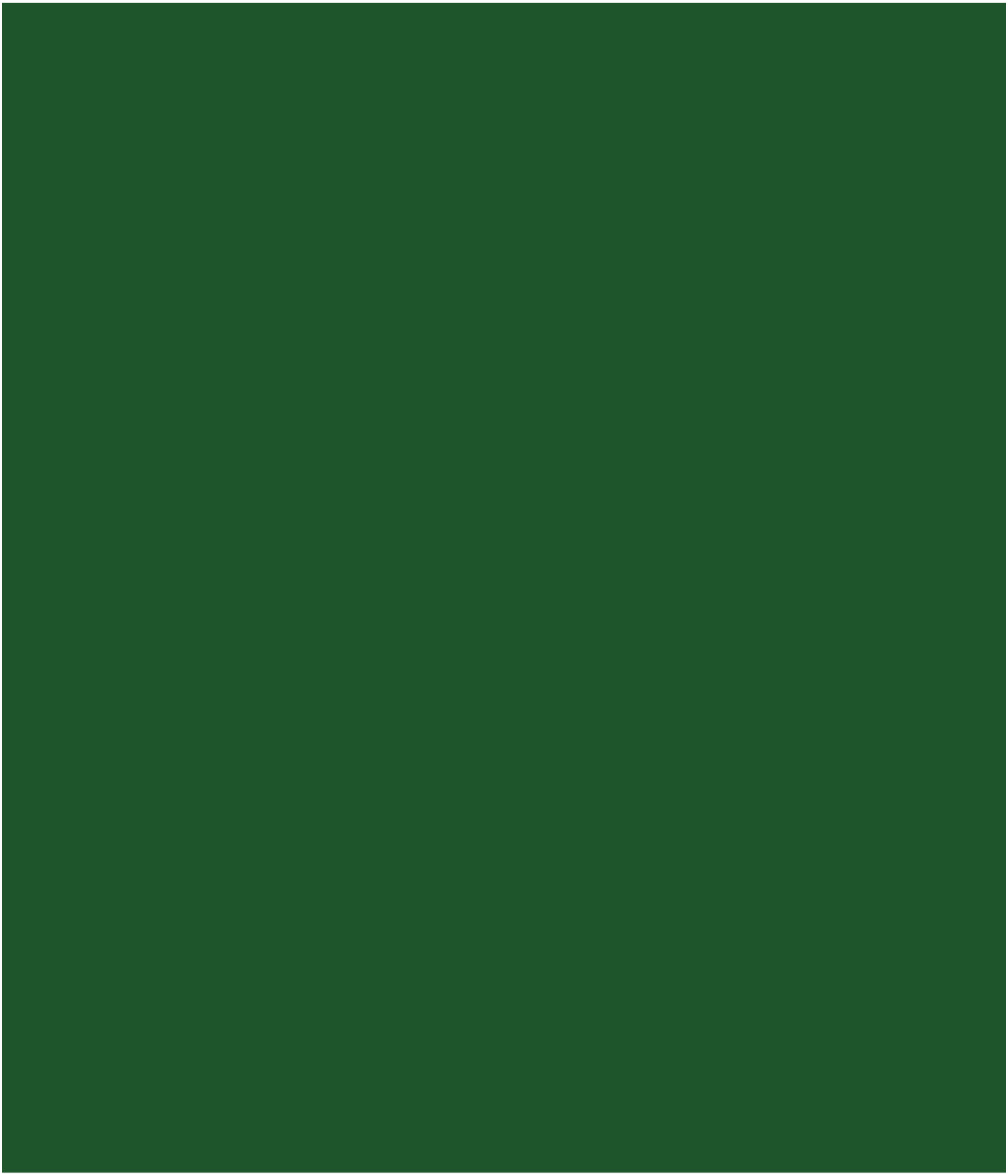


Table of Contents


HALTON

Introduction and Purpose

The Regional Municipality of Halton (herein after referred to as "The Region") is committed to purchasing goods and services from responsible Vendors that provide quality goods and services at competitive prices. Vendors, subcontractors, employees, agents, bidders and potential bidders that provide goods and services to the Region (herein after referred to as "Vendors") are expected to support the Region's goals and objectives of encouraging competitive bidding, ensuring fairness, accountability and transparency in the procurement process, and obtaining the best possible value in the procurement of goods and services for the Region.

The Region expects Vendors to perform all duties in a competent and impartial manner that can withstand the closest public scrutiny. Vendors are expected to exercise good judgement when doing business with the Region. This Vendor Code of Conduct (herein after referred to as "Vendor Code") sets out the principles applicable to Vendors that wish to establish and maintain a business relationship with the Region. The Region is confirming its intention to do business with Vendors that demonstrate solid business integrity that aligns with the Region's core values and high standards of ethical behaviour. Vendors must also inform their employees and any sub-contractors or sub-vendors about this Vendor Code.

The Vendor Code is consistent with Halton Region's Code of Conduct, which sets out the expectations for Regional staff. The Region's Code of Conduct is available on the Region's website.

The Vendor Code should not be read in lieu of, but in addition, to Vendors obligations as set out in any agreements between the Region and a Vendor. In the event of a conflict between this Code and an applicable agreement, the agreement shall govern.

Vendor Responsibilities

Vendors are required to familiarize themselves with this Vendor Code and comply with it as a condition of doing business with the Region. Vendors are expected to adhere to the following core principles of business integrity:

a) uphold the laws of the Region, Ontario and Canada, and not be a party to their breach, evasion or subversion;

b) treat all persons honestly and fairly, with proper regard for rights, entitlements, duties and obligations, and at all times act responsibly and diligently in the performance of their duties;

c) be professional and courteous, and resolve any work-related disagreements in a responsible and expeditious manner;

d) be accountable and responsible for their decisions and actions, take ownership of problems and initiate corrective actions;

e) promote the health and safety of others and prevent workplace illness, injury, harassment and violence;

f) carry out their duties in a fair, impartial and transparent manner;

g) complete the Acknowledgment Form as set out in Appendix A; and

h) report on non-compliance or suspected non-compliance of the Vendor Code.

These principles are also consistent with the Halton Region Code of Conduct.

I. Compliance with Laws

Vendors that wish to do business with the Region shall abide by all applicable laws and regulations including Federal, Provincial and Local laws regarding environmental matters, occupational health and safety, labour and employment practices, human rights, accessibility, immigration, product safety, shipping and product labelling. If Vendors become aware of any activities that are not in compliance with all applicable laws and regulations, they must report it immediately as specified in the non-compliance reporting section of this Vendor Code.

Vendors shall disclose:

1) any previous convictions of collusion, bribery, fraud or other similar practices prohibited under law for which they have not received a pardon; and

2) breach of the Region's Vendor Code or those of any other related Agencies or Corporation(s) of the Region.

Vendors are prohibited from misrepresenting their relevant past experiences and qualifications in relation to any solicitation process and acknowledge that the Region's process of evaluation may include information provided by the Vendor's references as well as records of past performance on previous contracts and services with the Region. The Region reserves its rights if the Vendor fails to make the appropriate disclosures and representations.

II. Confidentiality and Privacy

Vendors may have access to confidential and/or personal information by reason of their duties and responsibilities with the Region. Confidential information is defined as any information that is proprietary, strategic, technical, business or personal and not available to the public. All Vendors must respect such information and ensure it is safeguarded from unauthorized disclosure or access. Confidential information must be protected in accordance with the Vendor Code of Conduct. Such information must only be used or disclosed in accordance with this Vendor Code of Conduct and the provisions of the *Municipal Freedom of Information and Protection of Privacy Act, 1990* and the *Personal Health Information Protection Act, 2004*.

Disclosure of information means making the information available to others, and should only occur where disclosure is necessary and proper in the discharge of the Region's functions or where the disclosure is required by law. This includes and protects any information that is, and should be considered as, internal information relating to Regional business.

Vendors must not disclose confidential and/or personal information unless specifically and explicitly permitted in the terms of their contract. The duty of a Vendor to maintain the integrity and confidentiality of Regional information continues once that Vendor ceases to be in a contract with the Region.

When discussing business matters, Vendors must consider their surroundings. Conversations in public places should be limited to information that is non-confidential and does not include references that could identify a person or situation.

III. Information Security

Vendors must use information obtained through their relationship with the Region only for the purposes of the supply relationship. Vendors must store information securely and have in place appropriate information security policies and procedures. Vendors must notify the Region promptly of actual or suspected privacy breaches, security breaches or loss of Regional information.

iv. Social Media

The Region supports the use of online communications to enhance customer service and leverage the Region's brand. Vendors should not communicate on social media platforms on behalf of the Region unless the Vendor is expressly authorized in writing to do so by the Region. When such communication is authorized, it is to be conducted in a manner that is consistent and respectful of Canadian libel laws, *Municipal Freedom of Information and Protection of Privacy Act, 1990* and the Region's practices in regards to confidential information and intellectual property.

All Regional data or information obtained by the Vendor through the delivery of services or goods is to be considered proprietary and confidential. Without the Region's prior consent, Vendors should not communicate to social media platforms identifying the Region as a client and the associated services and goods provided to the Region. Regional consent must be obtained prior to identifying the Region as a client.

Integrity and Public Confidence

I. Conflict of Interest

Public confidence in the Region is put at risk when the conduct of a Vendor involves or appears to involve a conflict between public duty and private interests. Vendors are required to support and advance the interests of the Region and avoid placing themselves in situations where their personal interests actually or potentially conflict with the interests of the Region. Vendors shall disclose to the Region any situation that could result in an actual, apparent or perceived conflict of interest and the Regional employee that has an interest in the Vendor's business (or any other economic or family ties with the Vendor).

Vendors are expected, at minimum, to:

a) base business decisions strictly on merit and the best interests of the Region in a manner consistent with their contractual obligations with the Region;

b) avoid any situation that may create a real or perceived conflict of interest;

c) not take part in, or in any way influence, any Regional decision that might result in a financial or other advantage, whether direct or indirect, as a result of the contractual association with the Region;

d) not attempt to gain an improper advantage or preferential treatment from Regional employees; and

e) provide no personal benefit to employees of the Region.

If Vendors become aware of any activities that may be considered a conflict of interest involving the Region, they must report it immediately as specified in the non-compliance reporting section of this Vendor Code.

II. Business and Personal Relationships

Vendors shall not use or seek to use their association with the Region to receive direct or indirect benefit for themselves or their family members, friends and any other businesses or consultants that they or the Region do business with.

III. Avoidance of Preferential Treatment

Vendors shall not grant preferential treatment to any Regional staff, their family and friends, or any businesses. Vendors must avoid creating or appear to create an obligation for the purpose of gaining any special consideration.

Iv. Gifts and Hospitality

Accepting a gift, hospitality or other benefit from a Vendor could influence an employee's judgment and performance of official duties, or give the appearance of doing so, even if the employee believes the benefit will not affect their objectivity or impartiality. Vendors must not offer, directly or indirectly, any gift, hospitality or other benefits to the Region's staff. Gifts having a monetary value such as cash, gift certificates, loans, services, discounts and ticket(s) to an entertainment event including sporting events, concerts or other such related activities must not be offered. These requirements do not change during traditional gift-giving seasons.

Under no circumstances should a Vendor solicit gifts, hospitality and/or other benefits or transfers of economic value to Region staff. The same is expected of the Region staff—not to solicit gifts or other benefits from Vendors.

All Regional staff are subject to the rules governing the acceptance of gifts outlined in the Purchasing By-law, Section 29, Prohibitions, and the Halton Region Code of Conduct.

Employees may accept common expressions of courtesy that do not cause suspicion about the objectivity and impartiality of the employee, would not compromise the integrity of the Region and:

a) are of a nominal value not to exceed fifty ($50);

b) occur on infrequent and exceptional basis; and

c) are not ticket(s) to an entertainment event including sporting events, concerts, or other such related activities.

Vendors must not place Regional employees in the difficult position of having to refuse gifts that would place them in conflict with the rules governing the acceptance of gifts outlined in this Vendor Code.

v. Political Activity

No Vendor shall engage in political activity on Regional property while carrying out the requirements of their contract for the Region. If Vendors become aware of any political activities, they must report it immediately as specified in the non-compliance reporting section of this Vendor Code.

vi. Fraud

The Region is committed to the highest standards of corporate accountability, transparency, responsibility and integrity. The Region will protect funds, property, information and other assets owned by or in the care of the Region through the prompt investigation of any alleged fraudulent conduct.

Vendors must not engage in any fraudulent activity. Examples of activities which may be considered fraudulent include, but are not limited to:

a. forgery or alteration of documents (cheques, purchase orders, time sheets, etc.);

b. misappropriation of funds, securities, supplies or assets;

c. authorization or receipt of payment for goods not received, services not performed or hours not worked;

d. any claim for reimbursement of expenses that were not incurred for the exclusive benefit of the Region;

e. authorization of unjustified or inflated change order requests to increase profits;

f. knowingly delivering works, goods or services that do not meet contract specification; and

g. subcontracting to business entities that are not arm's length without prior consent of the Region.

If Regional Vendors, their employees, associates or other third parties become aware of any activities that may be considered fraudulent, they must report it immediately as specified in the non-compliance reporting section of this Vendor Code.

vii. Theft and Vandalism

The Region's assets must be protected from theft, destruction, vandalism and neglect, and used properly and strictly for the Region's purposes. Vendors' personal use, misuse, misappropriation of/or theft or vandalism of Regional property, resources, equipment, materials and supplies is prohibited.

viii. Anti-Bribery and Anti-Corruption

Vendors are expected to comply with applicable anti-corruption laws, whether domestic or foreign, including but not limited to the *Corruption of Foreign Public Officials Act, 1998* and the Criminal Code, and not engage in any form of corrupt practices including, but not limited to, extortion, fraud, bribery or other unlawful payment or benefit to secure any concession, contract or other favourable treatment.

Vendors should not engage in any conduct that would put the Region at risk of violating anti-bribery laws or regulations. Bribery is the giving or receiving of a "thing" of value to influence the actions of another person or organization.

Types of bribery can include, but are not limited to:

a) kickback payments that could be received before, during or at the end of a project/contract; and

b) any financial benefits given with the intent of influencing the recipient which includes such things as gifts (for example, travel or entertainment), loans, credit cards, purchase overpayments, cash, fees and commissions.

ix. Collusive Bidding

Vendors are not to participate in collusive bidding. Groups of bidders might secretly agree to submit complementary high bids to allow pre-selected Vendors to win contracts on a rotating basis, divide contracts by territory or take steps to defeat the competitive process and divide work. Vendors are not to contract with separate business entities that are not arm's length, submit a bid through non arm's length entity or reveal confidential information to an arm's-length or non-arm's length entity.

If Vendors, their employees, associates or other third parties become aware of any activities that may be considered bribery or collusive bidding, they must report it immediately as specified in the non-compliance reporting section of this Vendor Code.

Workplace Well-being

I. Respectful Workplace

The Region is committed to protecting the health and safety of all Regional employees and Vendors against illness, injury and incidents of violence and harassment. Every Vendor will make every effort to provide and maintain a safe and healthy work environment, as well as maintain a diverse and respectful workplace in which the dignity and self-respect of every person is valued.

Vendors must ensure that their personal conduct within the workplace and elsewhere does not adversely affect:

a) their ability to perform their official duties;

b) the ability of other Vendors to perform their duties; or

c) public confidence in the Region or in the public sector.

II. Accessibility for People with Disabilities

Vendors are required to have met compliance obligations in the *Accessibility for Ontarians with Disabilities Act, 2005* and Ontario Regulation 191/11-Integrated Accessibility Standards, as applicable.

III. Employment Practices

Vendors must abide by applicable employment standards, labour, non-discrimination and human rights legislation. Where laws do not prohibit discrimination or where they allow for differential treatment, Vendors are expected to be committed to non-discrimination principles and operate in a way that does not differentiate unfairly.

iv. Impairment at Work

In order to minimize the risk of impaired performance due to substance use, the following are strictly prohibited for all Regional Vendors:

- use, possession, distribution, offering or sale of illegal drugs, illegal drug paraphernalia or un-prescribed drugs (for which a prescription is legally required in Canada) while on Regional business or premises;
- use, possession, distribution, offering or sale of alcoholic beverages or cannabis on Regional premises;
- intentional misuse of prescribed medications, over-the-counter medications or other substances while on Regional business or premises; and
- being unfit for work due to the effects or after-effects of alcohol, illicit or illegal drugs, un-prescribed drugs (for which a prescription is legally required in Canada) or the intentional misuse of medications or other substances.

Vendors are required to report to their Regional supervisor or project authority the use of any medication that may affect their ability to perform their job in a safe manner. Vendors have a responsibility to manage potential impairments during working hours due to the legitimate use of medications in consultation with their personal physician.

If Vendors, their employees, associates or other third parties become aware of any activities that may be considered impaired performance due to substance use, they must report it immediately as specified in the non-compliance reporting section of this Vendor Code.

Non-Compliance Reporting

Vendors must report any practices, behaviours, activities or actions believed to be in contravention or in conflict with this Vendor Code, Halton Region Code of Conduct or any other Regional policy.

The Region will resolve all complaints regarding violations of this Vendor Code to the greatest extent possible in a timely, respectful and confidential manner, and ensure all Vendors are held accountable for their actions.

All Vendors shall be free from reprisal, discipline, harassment or discrimination as a result of reporting, in good faith, a breach or suspected breach of this Vendor Code. If it is determined, however, that a complaint is frivolous, vexatious or malicious in nature, the complainant may be subject to action as outlined in the Penalty for Non-Compliance section of this Vendor Code.

During the investigation and resolution of complaints, all information, including the identity of the complainant and any other Vendors or Vendor staff involved, will remain confidential except where sharing information is otherwise required by law or required to further the investigation.

I. Complaint Resolution Procedure

EARLY RESOLUTION

Vendors who become aware of or have directly experienced an action which is in contravention of this Vendor Code should:

a) keep a written record of the incidents, dates, time, locations, possible witnesses, any attempted resolutions and behaviours of the Vendor(s) involved; and

b) report the breach to the Director of Supply Chain Management, who must investigate and attempt to resolve the complaint as expeditiously as possible, except in the case of suspected fraud, which is to be immediately reported to the Chief Internal Auditor as specified in the Formal Complaint Investigation section of this Vendor Code.

The Regional Municipality of Halton
Director of Supply Chain Management
1151 Bronte Road
Oakville ON L6M 3L1
905-825-6000 ext. 7231
Sam.Pringle@halton.ca

If the Director of Supply Chain Management is not able to resolve the complaint to the reporting Vendor's satisfaction, and/or the complaint involves the Director of Supply Chain Management, a complaint shall be filed directly to the Region's Chief Internal Auditor or to the Code of Conduct Help Line.

FORMAL COMPLAINT INVESTIGATION

a) Complaints must be made in writing and signed by the complainant using a designated form. The form is available on the Region's website.

b) Complaints must be forwarded to the Chief Internal Auditor, who will initiate an investigation into the complaint within five (5) business days of receipt.

The Regional Municipality of Halton
Chief Internal Auditor
1151 Bronte Road
Oakville ON L6M 3L1
905-825-6000 ext. 7532
Karen.Cinq-Mars@halton.ca

c) Once the investigation is complete, the investigation findings and recommendations will be reported to the complainant and respondent, as appropriate and as determined by the Chief Internal Auditor.

II. Alternative Reporting – Confidential Code of Conduct Help Line

A Vendor who does not feel comfortable reporting a complaint as outlined above may contact the Region's confidential and anonymous Vendor Code of Conduct Help Line (available 24/7) at:

- Toll-free telephone: 1-833-210-0001
- Website: www.lighthouse-services.com/haltonvendor
- Email: reports@lighthouse-services.com (must include Halton Region in the subject line)

a) All complaints submitted to the Vendor Code of Conduct Help Line will be received by a third party who will relay the complaint, without revealing the caller's identity (if requested), to the Chief Administrative Officer.

b) The confidential complaint will be reviewed by the Chief Administrative Officer and the Director of Human Resources within five (5) business days of the initial review.

c) Once the investigation is complete, the investigation findings and recommendations will be reported to the complainant and respondent, as appropriate, if their identities are made known.

The Region does not guarantee that an investigation will be conducted for every complaint.

Penalty for Non-Compliance

Any vendor who contravenes the Vendor Code, including any provision of this Vendor Code, may be subject to:

a) verbal or written warning;

b) cancellation of business relationship and/or contract;

c) disqualification from participating in future business opportunities; and/or

d) such other action or penalty as may be appropriate and permitted by law in the circumstances of the particular contravention.

This Vendor Code may be modified from time to time by the Region at its discretion.

Acknowledgement Form

The attached Vendor Code of Conduct sets forth the principles required by the Regional Municipality of Halton ("the Region") of all Vendors who supply goods and services to the Region when conducting business with the Region.

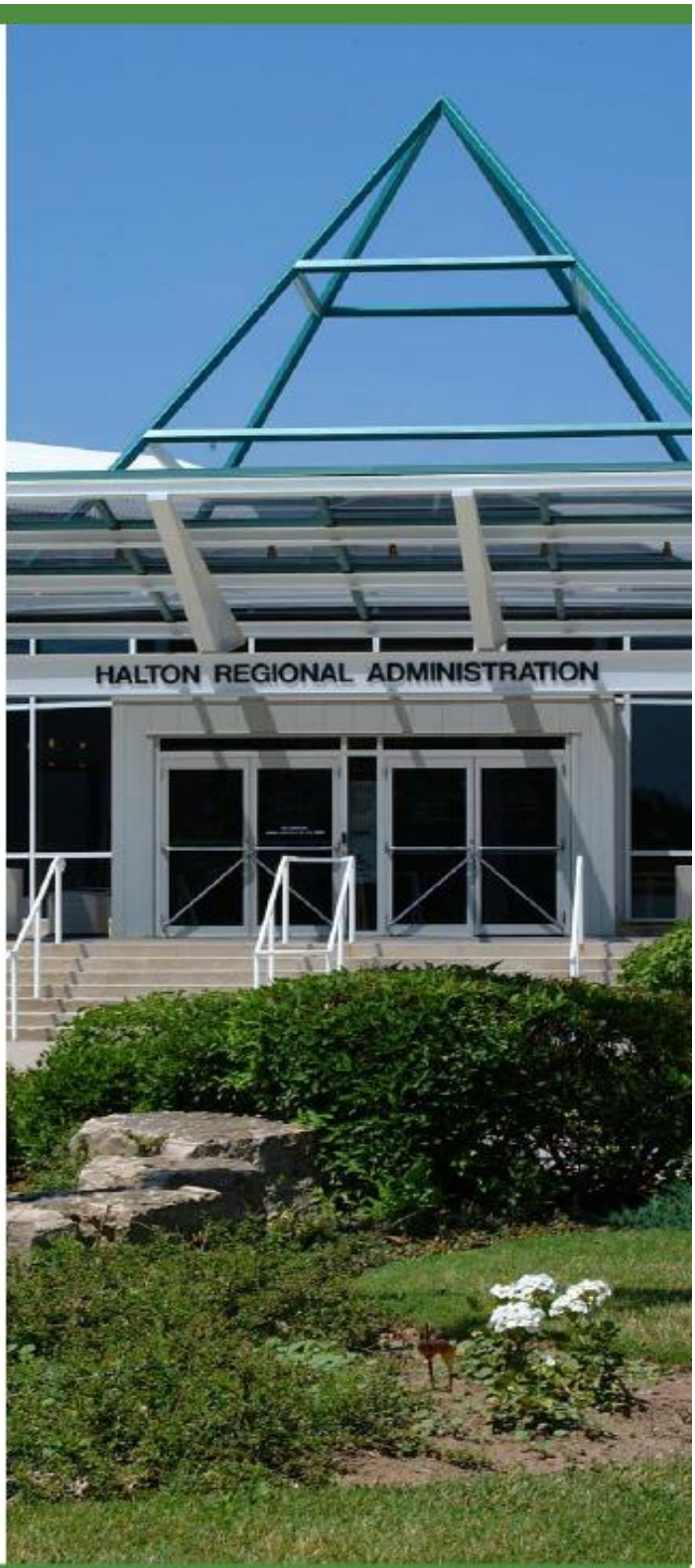
By signing this Acknowledgement, the undersigned Vendor agrees to abide by the Vendor Code of Conduct and also agree to ensure its employees, officers, agents, representatives, and subcontractors are also made aware of and comply with it.

ACKNOWLEDGEMENT

I, _____ an authorized representative of _____, hereby acknowledge and agree to abide by the attached Vendor Code of Conduct, and will ensure that the employees, officers, agents, representatives and subcontractors of _____ are aware of and abide by such policies and principles in the process of preparing and submitting bids and proposals for Regional work, provisions of goods and services to the Region, and during the performance of all agreements entered into with the Region for such purposes.

Submitted by:
(Please type/print)

Business Name	Signature of Signing Officer
Street Address	Name and Title (please print)
City/Town / Postal Code	Signature of Contact Person
Telephone Number / Fax Number	Name and Title (please print)
Contact Email Address / Date	



Halton REGION

halton.ca 311