

# Request for Quotation (RFQ) FOR CIVIC CENTRE COOLING SYSTEM REPLACEMENT

# **SUMMARY:**

The Town of Canmore is issuing this Request for Quotation (RFQ) to select a HVAC service provider for the replacement of the existing chilled water system with a conventional chilled air-cooling system for the Canmore Civic Centre.

REFERENCE NUMBER:	CAP 7227
CLOSING DATE:	JULY 31, 2024
CLOSING TIME:	14:00:00 Mountain Time Zone
DATE ISSUED:	JULY 10, 2024
NOTE:	RESPONSES WILL NOT BE OPENED PUBLICLY



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# 1.0 INSTRUCTIONS FOR RESPONDING TO THIS REQUEST FOR QUOTATION (RFQ)

- 1.1.1 Closing Date and Time: Quotations must be received not later than 14:00:00 hours Mountain Time Zone (Canmore local time) on Wednesday, July 31, 2024.
- **1.1.2** Responses are to be delivered to:

Proponents shall submit their quotation to the Town of Canmore by email to the attention of Amy Bernard at <a href="mailto:amy.bernard@canmore.ca">amy.bernard@canmore.ca</a>

The quotation document is to be in PDF format only (.pdf) and all components shall be formatted and combined into one file that is attached to the email submission. Responses by facsimile will not be accepted.

# 1.1.3 RFQ Contact Person:

For clarification or additional information, Proponents shall **only** contact the person listed below.

Amy Bernard, Facilities Project Manager

Email - amy.bernard @canmore.ca

See Section 2.0, item 2.6 below for additional information for Questions and Clarifications.

- **1.1.4** The Town of Canmore may in its sole discretion disqualify responses that do not meet the formatting and other criteria set out in Section 4.0 of this RFQ.
- **1.1.5** Responses must be in English.
- 1.1.6 Quotations shall be stated in Canadian dollars with Goods and Services Tax (GST) extra.
- 1.1.7 Each Proponent is solely responsible for ensuring that its response is received at the specified address (physical address or email address) by the specified closing date and time. Strict adherence to the closing date and time will be maintained, and unless the deadline date is extended by issue of Addendum, all responses received after this time and date will be returned unopened.

**END OF SECTION 1.0** 



# 2.0 GENERAL CONDITIONS OF RESPONSE

# 2.1 PURPOSE OF THE REQUEST FOR QUOTATION (RFQ)

The Town of Canmore is issuing this Request for Quotation (RFQ) to select a a HVAC service provider for the replacement of the existing chilled water system with a conventional chilled aircooling system for the Canmore Civic Centre.

The Town of Canmore reserves the right to modify the terms or cancel the RFQ process at any time.

# 2.2 SUBMISSION OF RESPONSE TO THE RFQ

- **2.2.1** By submitting a response to this RFQ, each Proponent accepts its terms and conditions. In addition, by submitting its response each Proponent waives all claims, rights, demands and the benefit of any provisions of any statute, rule of law or regulation that might adversely affect the rights of the Town of Canmore under this RFQ.
- 2.2.2 Each Proponent shall make full disclosure of any actual or potential conflict of interest arising from any existing business or personal relationships with any of the following (each, a "Conflicted Person"): (i) any employee of the Town of Canmore; (ii) any member of the Town of Canmore Town Council (councillor); (iii) any board or committee member; (iv) any family member of any such employee, councillor or board/committee member; or (v) any business entity controlled by or otherwise not at arm's length to any one or more of any such employee, councillor, board/committee member or family member.

Without limiting the foregoing, details should be provided of any direct or indirect pecuniary interest of any Conflicted Person in the supply of the services contemplated by this RFQ.

Disclosure of any such actual or potential conflict of interest shall be made in writing with the Proponent's response.

- 2.2.3 This RFQ and any contracts subsequently entered into as a result hereof shall be governed by the laws of the Province of Alberta and the laws of Canada applicable therein. The courts of the Province of Alberta shall have exclusive jurisdiction over this RFQ and any contracts entered into as a result hereof.
- **2.2.4** Quotation documents must be completed in accordance with the requirements of the RFQ documents and no amendment or change to quotations will be accepted after the closing date and time.
- **2.2.5** All documents submitted by Proponents in response to this RFQ are to remain the property of the Town of Canmore.
- **2.2.6** Quotations shall be irrevocable for sixty (60) days following the closing of the RFQ and the quotations shall be retained by the Town of Canmore.
- 2.2.7 Quotations shall be signed by an authorized signatory of the Proponent using the Signature and Waiver Sheet in Section 5.0. If the Proponent is an incorporated company, the corporate seal of the Proponent shall be affixed or a certified true copy of a resolution of the corporation naming the person(s) in question as authorized to sign agreements on behalf of the corporation shall be attached to the quotation. Proponents who are sole proprietorships or partners shall sign their RFQ response in such a way as to irrevocably bind the Proponent in an authorized manner.



# 2.3 NO COMMITMENT

2.3.1 No commitment on the part of the Town of Canmore shall exist under this RFQ unless and until the Proponent receives official written confirmation from the Town of Canmore that it has been selected to complete the work.

# 2.4 LIMITATION OF LIABILITY

2.4.1 The Town of Canmore will have no liability to any person or entity for any damages, including, without limitation, direct, indirect, special or punitive damages, arising out of or otherwise relating to this RFQ, the Proponent's participation in this RFQ process or the Town of Canmore's acts or omissions in connection with the conduct of this RFQ process. This limitation applies to all possible claims by a Proponent, whether arising in contract, tort, equity, or otherwise, including, without limitation, any claim for a breach by the Town of Canmore of a duty of fairness or relating to a failure by the Town of Canmore to comply with the terms set forth in this RFQ.

# 2.5 ACCEPTANCE OR REJECTION

- **2.5.1** The Town of Canmore reserves the right to reject any or all responses. Without limiting the generality of the foregoing, the Town of Canmore may reject any response which it deems:
  - a) is incomplete, obscure, irregular, unrealistic or noncompliant;
  - b) has erasures, ambiguities, inconsistency or corrections; or
  - fails to complete, or provide any information required by, any provision of this RFQ.

Further, a response may be rejected on the basis of the Town of Canmore's understanding of the Proponent's past record of work, its general reputation, its financial capabilities, the completion schedule or a failure to comply with any applicable law.

The purpose of the Town of Canmore is to obtain the most suitable responses to the Project and to further the interests of the Town of Canmore and what it wishes to accomplish in carrying out the Project. Therefore, the Town of Canmore has the right to waive any irregularity or insufficiency or non-compliance in any response submitted and to accept the response or responses which it deems most favourable to its interests or to reject all responses and cancel the RFQ.

In addition to any rights identified elsewhere in this RFQ, the Town of Canmore reserves the right to:

- a) reject any and all responses;
- b) add, delete or change the terms of this RFQ at any time prior to the specified closing date and time;
- during the evaluation period, seek clarification of any Proponent's response, including consequential amendments, or any additional information from any Proponent;
- d) accept or reject, in whole or in part, any response without giving any reason;
- e) have any documents submitted by the Proponent reviewed and evaluated by any party, including independent Consultants;
- f) cancel the RFQ process without penalty at any time for any reason; and
- g) negotiate and enter into an agreement with any Proponent notwithstanding any noncompliance by the Proponent's response with any requirement of this RFQ.

The Town of Canmore is the sole and final judge with respect to the selection of any Successful Proponent as a result of this RFQ process.



All Proponents submitting a response to this RFQ will be advised of the results of the RFQ process by email or regular mail. Please allow at least three weeks for responses to be evaluated by the Town of Canmore.

# 2.6 QUESTIONS AND CLARIFICATIONS

- **2.6.1** Procedural or technical questions shall be submitted in writing and should include references to a specific section and item number.
- **2.6.2** Dependent upon their nature, comments or answers will be returned via email or through an addendum should the information be applicable to all Proponents.
- 2.6.3 Amendments to this RFQ will be valid and effective only if confirmed by written addenda. Addenda may be issued during the response period. All addenda become part of the agreement and receipt must be confirmed in the Proponent's submission.
- **2.6.4** Any addenda documents will be issued by the same method that this RFQ was issued.
- **2.6.5** It is the Proponent's responsibility to clarify the interpretation of any item of this RFQ a minimum of 72 hours prior to the stated closing date and time by contacting the Town of Canmore's designate (as above).

# 2.7 DISCREPANCIES IN NUMBERS

- **2.7.1** In the event of a numerical discrepancy or error in a quotation, the written number will prevail.
- **2.7.2** In the event of pricing extension errors, the unit price will apply.

# 2.8 CONFIDENTIALITY AND FREEDOM OF INFORMATION AND PROTECTION OF PRIVACY ACT

- 2.8.1 All information including, without limitation, any technology of a proprietary or novel nature which is disclosed to a Proponent by the Town of Canmore or a third party as a representative of the Town of Canmore (which information, in addition to the confidentiality requirements hereunder, will be kept confidential by the Proponent in accordance with the terms of its disclosure by such third party) or which is otherwise obtained by the Proponent in connection with this RFQ process, other than that which is common knowledge or within the public domain, is the confidential property of the Town of Canmore and must not be disclosed by the Proponent, except to duly authorized representatives of the Town of Canmore. Such confidential information or property is not to be employed other than in connection with responding to this RFQ unless otherwise duly authorized by the Town of Canmore in writing. These confidentiality provisions will remain binding obligations on each Proponent following the conclusion of this RFQ process until the Town of Canmore reasonably determines that such confidential information referred to herein has become part of the public domain (other than by disclosure or use prohibited herein) and releases the Proponent from its confidentiality obligation. This requirement does not prohibit any Proponent from complying with an order to provide information or data issued by a court or other authority with proper jurisdiction or to act to correct or report a situation which the Proponent may reasonably believe to endanger the safety or welfare of the public.
- **2.8.2** The applicant acknowledges that any information or documents provided by it to the Town of Canmore may be released pursuant to the provisions of the *Freedom of Information and Protection of Privacy Act*. This acknowledgement shall not be construed as a waiver of any right to object to the release of any information or documents.



- 2.8.3 The Town of Canmore acknowledges that a Proponent's response may contain information in the nature of a Proponent's trade secrets or commercial, financial, labour relations, scientific or technical information of or about a Proponent. The Town of Canmore agrees that portions of responses to this RFQ which are provided in confidence will be protected from disclosure to the extent permitted by law. The Town of Canmore is bound by the *Freedom of Information and Protection of Privacy Act* (Alberta), as amended from time to time, and all documents submitted to the Town of Canmore will be subject thereto. Each Proponent must identify appropriate parts of its response or other documents submitted to the Town of Canmore as confidential and specify what harm could reasonably be expected from its disclosure; however, the Town of Canmore may not be able to ensure that such parts will not be protected from access.
- 2.8.4 Proponents are advised that the Town of Canmore will, as necessary, be disclosing the responses on a confidential basis to its employees and advisors who have a need to know in connection with this RFQ process for, among other things, the purpose of evaluating and participating in the evaluation of the responses. It is the responsibility of each Proponent to ensure that all personal information provided to the Town of Canmore with respect to the Proponent's personnel and their experience is supplied with the informed consent of such individuals and in accordance with applicable law. By submitting any personal information each Proponent represents and warrants that it has obtained the informed consent of the individuals who are the subject of such information to its collection, use and disclosure for purposes of this RFQ response. Also, such individuals are agreeing to the use of such information as part of the RFQ evaluation process, for any audit of the procurement process and for contract management and performance purposes.

# 2.9 COST OF PREPARATION

**2.9.1** Any cost incurred by the Proponent in the preparation of its response to this RFQ shall be borne solely by the Proponent.

# 2.10 OWNERSHIP OF SUBMISSIONS

- **2.10.1** All responses submitted to the Town of Canmore become the property of the Town of Canmore and shall not be returned. They will be received and held in confidence by the Town of Canmore, subject to the provisions of the *Freedom of Information and Protection of Privacy Act*.
- **2.10.2** Unsuccessful Proponent submissions will be kept as record for the procurement process until two years after the date of decision for the RFQ award.

# 2.11 CLARIFICATION FROM PROPONENTS

**2.11.1** The Town of Canmore reserves the right to seek from any/all Proponents any further clarification it may require on responses submitted pursuant to this RFQ.

# 2.12 PROPONENT PERFORMANCE

2.12.1 The selected Proponent may be evaluated throughout the course of service delivery in connection with any specific work or projects undertaken as a result of any agreement entered into between any Proponent and the Town of Canmore. The Town of Canmore may also conduct periodic reviews/assessments of any selected Proponent, taking into consideration, in addition to specific work related to the project undertaken by the Proponent, ongoing Proponent staff qualifications, experience, training, and staff changes. Any evaluation/assessment will be shared with the Proponent, with the goal of immediate and permanent resolution where concerns have been raised. The Town of Canmore reserves the



right to remove from the roster any selected Proponent who has been qualified by this RFQ process by way of written notice if, in the sole discretion of the Town of Canmore, based on any on-going or specific evaluation or assessment of the Proponent or its performance of any work, it is deemed to be in the Town of Canmore's best interests.

# 2.13 FORM OF CONTRACT

2.13.1 The Town of Canmore will be issuing a letter of award to the Successful Proponent to deliver the work described within this RFP. The contract to be executed between the Town of Canmore and the Successful Proponent (Contractor) is a Stipulated Price CCDC 2 (2020) of the Canadian Construction Documents Committee. Refer to Appendix C for Supplementary Conditions for the CCDC 2 (2020) Contract. A Notice to Proceed must be received by the Successful Proponent prior to mobilizing to the site.

# 2.14 NON-ASSIGNMENT

2.14.1 Neither the contract nor any work to be performed under the contract or any part hereof may be assigned by the Successful Proponent without the prior written consent of the Town of Canmore. Such written consent, however, shall not under any circumstances relieve the Successful Proponent of its liabilities and obligations under the Contract and the granting of such consent shall be within the sole and unfettered discretion of the Town of Canmore.

# 2.15 DEPOSITS

**2.15.1** The Town of Canmore will consider the payment of a deposit to the Successful Proponent for the scope of work in this RFQ. Maximum percentage for a deposit that the Town of Canmore will consider is 50%. Include a payment schedule indicating the percentages and milestones as an attachment to the quotation if applicable.

# 2.16 TERMS OF PAYMENT

**2.16.1** Invoices will be paid within 28 days from the approval date of the invoice.

# 2.17 INSURANCE AND WORKERS' COMPENSATION BOARD REQUIREMENTS

2.17.1 Mandatory Eligibility Requirements

As a mandatory eligibility requirement for response to this RFQ:

- (a) The Successful Proponent shall carry at all times during the performance of the work General Liability/ Umbrella Liability Insurance with a limit of not less than FIVE MILLION DOLLARS (\$5,000,000) inclusive per occurrence for bodily injury (including death) and damage to property including loss of use thereof. Such insurance shall at a minimum include coverage of broad form property damage, contractual liability, cross liability, completed operations and product liability, and such other types of insurance as would be carried by a prudent person performing such contract work and as the Town of Canmore may from time to time require.
- (b) The Successful Proponent shall carry at all times during the performance of the work Automobile Liability Insurance for owned and non-owned automobiles with a limit of not less than TWO MILLION DOLLARS (\$2,000,000) inclusive per occurrence. However, any crane work and crane vehicle will require Automobile Liability Insurance for owned and non-owned automobiles with a limit of not less than FIVE



MILLION DOLLARS (\$5,000,000) inclusive per occurrence.

(c) The Successful Proponent shall at all relevant times carry Workers Compensation Board coverage of either of Alberta or of another AWCBC board that will extend the required amount of coverage to cover the employee outside of their home province. Proponents shall submit their WCB number together with a letter from the appropriate department indicating there are no outstanding fees, fines, claims or debts due on the Successful Proponent's account to the Town of Canmore prior to the commencement of the work.

### **2.17.2** Responsibilities of Successful Proponent

- (a) The Successful Proponent shall supply insurance coverage and pay all costs and expenses, including premiums relating to the insurance coverage requirements as set out herein, and shall supply the Town of Canmore with a certificate of insurance for all policies on an annual basis. Such policies will include a statement that the coverage shall not be terminated without a prior 30-day written notice to the Town of Canmore.
- (b) The Successful Proponent or their insurer will notify the Town of Canmore at least thirty (30) days prior to any change in insurer, any cancellation of the insurance policy, or any substantial change in the policy or coverage that would materially alter the coverage provided by the Successful Proponent to the Town of Canmore.
- (c) The Successful Proponent shall provide a certificate of such insurance to the Town of Canmore within five (5) days of notification of award or prior to commencing the work, whichever is sooner.

# 2.18 INDEMNIFICATION

- 2.18.1 The Successful Proponent agrees to indemnify and save harmless the Town of Canmore, its councillors, officers, agents, representatives, and employees, against all suits or claims, requests, legal action and liability regardless of the nature and expenses sustained from injuries or death or any damages or loss to property as a result of the usage of premises or in the execution of the Successful Proponent functions arising from this contract except to the extent of the Town of Canmore's gross negligence.
- 2.18.2 At no time will the Town of Canmore be responsible for any injury sustained by the Successful Proponent, their employees or any person on the Town of Canmore's premises, nor will the Town of Canmore be responsible for any loss, including loss of profits or damage caused to the goods of the Successful Proponent, their employees or any other person, including damage to vehicles and their contents, while these goods are on the Town of Canmore's premises or site.
- **2.18.3** The Town of Canmore shall not be liable for any incidental, indirect, special or consequential damages or any loss of use, revenue or profit of the Successful Proponent arising out of or in any way related to this RFQ or subsequent contract.

# 2.19 INFORMATION SECURITY STANDARDS

2.19.1 Successful Proponents that provide information technology or web-related services to the Town of Canmore as part of their work on the Project shall be required to comply with the Town of Canmore's Information Security Standards as updated from time to time. These standards may overlap with and are additional to the functional and requirements of the specific Project. The Town of Canmore may require Proponents to demonstrate compliance with these standards as part of the Town's review and evaluation of proposals, quotations



and qualifications. If not appended hereto, it is the Proponent's responsibility to request the Information Security Standards and access their ability to comply as part of responding to this request.

**END OF SECTION 2.0** 

Town of CANMORE

# 3.0 PROJECT OVERVIEW AND SCOPE

# 3.1 RFQ DEFINITIONS

Owner the Town of Canmore

Project Civic Centre Cooling System Replacement

Proponent a firm, individual or company who or which intends to

submit or submits a Proposal pursuant to this RFP.

Proposal a submission to the Town of Canmore in response to

this RFP.

Successful Proponent a firm, individual or company with whom the Town of

Canmore may decide to initially discuss contract arrangements based upon acceptance of the

Proponent's Proposal.

Heating, Ventilation,

Air Conditioning Contractor the Successful Proponent to whom the Town of

Canmore issues a contract for the Cooling System

Replacement work.

Mechanical Engineering Consultant the Owner's mechanical expert representative

# 3.2 PROJECT DESCRIPTION/DESCRIPTION OF NEED

**3.2.1** When the Civic Centre was built in 2004, the design utilized four pipe fan coil units that provide heating and cooling through an under-floor air distribution (UFAD) system, and domestic water (drinking water) to cool the building. A make-up air unit located in the boiler room provides the outside air for the building occupants, two boilers provide the heating water, and cooling is provided from two domestic water supply and return services into the building.

The cooling system required permission from the Province of Alberta to install and continues to require permission to operate. Water is taken from the domestic water supply line, pumped through the building cooling system, and then returned to the domestic supply line further down stream. The system relies on a chlorine monitoring system to ensure any contamination occurring to the water while in the system does not get passed into the domestic water system. This chlorine monitoring system requires daily checks by town Facilities staff and monthly by EPCOR. The chlorine monitoring system was upgraded in 2020.

The Province has advised that the practice of using domestic water supply for cooling is no longer supported, and after several extensions granted to the town, the system must be replaced by December 1, 2024. The Town is in on-going discussions with the Province to request an extension to this date.

The Town engaged a HVAC Consultant to analyze cooling requirements for the building and provide replacement recommendations. The Town also verified the roof structure was designed and built with sufficient capacity to support potential HVAC units on the roof.

The recommendation from the Consultant involves an outdoor air-cooled chiller that is mounted on the roof adjacent to the mechanical room. The existing chilled water pump, piping and cooling coils are reused. There is new piping from the chiller that will connect with the existing chilled water pump and piping.



# 3.3 PROJECT SITE

**3.3.1** The Town of Canmore Civic Centre is located at 902 7<sup>th</sup> Avenue, Canmore, Alberta. Parking is limited adjacent to the building, as will permissible lay-down areas. There are one-way alleys that border the building on the north and south sides (potential crane lay-down areas with appropriate Road Use Permits).

# 3.4 SCOPE OVERVIEW/SCOPE OF SERVICES

# **3.4.1** GENERAL SCOPE OF WORK

Supply and install one new rooftop packaged chiller, a chilled glycol expansion tank, chilled glycol fill tank and all other associated components for a functional air chilled unit (refer to the Mechanical Roof Plan, Details and Schedules from the Remedy Engineering Canmore Civic Centre Cooling Upgrade IFT drawing set (Appendix B)).

Demolition Work: All components that are not to be reused in the updated system will be decommissioned, removed from site, and recycled. The list includes:

# **Main Floor Washrooms:**

- 1. The existing incoming municipal domestic water return inside the building will be removed (Meter Room) and capped.
- 2. The existing cooling system chlorine measuring/control stations will be removed (as well as associated piping and electronics).

# **Meter Room**

- 1. Redundant piping for cooling water to/from the meter room to be removed.
- 2. Cooling system disinfectant measuring/control stations to be removed and associated piping and electronics.

### **Second Floor Washrooms:**

- 1. Remove existing chilled water supply riser from meter room below up to the mechanical room (return riser to remain).
- 2. Remove existing chilled water supply from corridor ceiling space (outside women's side door).

# **High Level – Mechanical Room:**

1. Remove existing chilled water supply from corridor (adjacent to the mechanical room).

# **Low Level – Mechanical Room:**

- 1. Relocate existing floor mounted expansion tank TK-1 to allow for new chemical pot feeder and glycol fill system.
- 2. Remove existing chilled water supply to cooling water pump. Cap and make good for connection from chiller supply in renovation phase.
- 3. Remove existing solar water heater and all associated piping.

Renovation Work: Full details are included in the Mechanical Renovation Plan & Schematic and Mechanical Roof Plan, Details and Schedules and Electrical sheets from the Remedy Engineering Canmore Civic Centre Cooling Upgrade drawing IFT drawing set (Appendix B).

# 3.4.2 ADDITIONAL INFORMATION FOR QUOTATION PREPARATION



1. The existing chilled water system volume is approximately 400 gallons, therefore the 30% glycol concentration is 120 gallons. Below is a detailed breakdown.

Pipe Size	Length	Volume/Foot	Sub-Total
(in.)	(Ft.)	(U.S. Gal.)	Volumes
24	0	20.93	0
22	0	18.03	0
20	0	14.45	0
18	0	11.65	0
16	0	9.18	0
14	0	7.61	0
12	0	5.82	0
10	0	4.09	0
8	0	2.63	0
6	0	1.5	0
4	0	0.67	0
3	170	0.39	66.3
2.5	0	0.25	0
2	1029.5	0.17	175.015
1.5	137.1	0.11	15.081
1.25	30	0.08	2.4
1	590	0.05	29.5
0.75	0	0.03	0
0.5	0	0.02	0
	Sub-Total		288.296
	+30% Coi	ls, Boiler, Etc.	86.4888
	Total Syst	tem Volume	374.785

2. Is is possible to schedule after hours shifts to perform coring and piping in the hallway.

# 3.4.3 DUTIES, RESPONSIBILITIES AND DELIVERABLES OF THE HVAC CONTRACTOR

- Award and manage all trade and sub-trade contracts (if applicable)
  - Confirmation of all sub-trade health and safety programs and their adherence to the project safety program
  - Adherence to the province of Alberta's Occupational Health and Safety Act provisions for working at heights safely when working near the edge of the building roof (area to be identified during pre-bid meeting)
  - Supply, erection, maintenance, and eventual removal of any barricades to keep members of the public and Civic Centre workers safe during construction work, including signs for washroom doors:
    - o The Civic Centre is intended to remain open at all times during this work.
    - The first floor of the Civic Centre is open to the public between 08:00 hrs and 16:30 hrs, Monday to Friday, and Saturdays from 10:00 hrs until 16:00 hrs.
  - Procure all permits for the scope of work (including but not limited to Electrical Permits, Town of Canmore Road Use Permits, Permission to Work, etc.)
  - Be responsible for quality control on the project.
  - The Successful proponent will be responsible for hoarding to ensure damage is not incurred to existing building components (e.g. flooring systems, washroom counters, toilets, mirrors, doorways, light systems, display cases, etc.). Sustained damages will be the responsibility of the Successful Proponent to replace and/or repair to the satisfaction of the Town.
  - Coordinate with the Town's Project Manager for inspections at key milestones, as well as for system verification with the Town's building operators prior to demobilization from site (refer to the construction inspections and quality control testing as outlined in the Remedy design package (Appendix B).



# **3.4.4** OPTIONS OR EXTENSIONS

No extensions to the above noted scope of work are currently identified.

# 3.4.5 SERVICES NOT INCLUDED

Work to any other area or system within the Civic Centre building.

# 3.5 ANTICIPATED PROJECT SCHEDULE

3.5.1

The following schedule has been established for this RFQ:

Pre-Bid Meeting	Proponents to Coordinate with Town
	August 21, 2024
Existing System Decommissioned	1 December 2024 (if system can be installed May 2025)

**END OF SECTION 3.0** 



# 4.0 RESPONSE REQUIREMENTS AND EVALUATION CRITERIA

# 4.1 FORMAT AND OUTLINE OF RESPONSES

Electronic RFQ responses are to be on 8.5" x 11" size pages in PDF (.pdf) format only and all components shall be formatted and combined into one file that is inserted into the email submission.

Responses to each section shall be marked with the corresponding letter and number (e.g. A1, A2, etc.).

# 4.2 QUOTATION SUBMISSION REQUIREMENTS

Proponents are requested to submit a quotation containing the following:

- **4.2.1** Mandatory Requirements:
  - 4.2.1.1 Signed signature and waiver sheet.
  - 4.2.1.2 Signed addendum (addenda) if applicable.
  - 4.2.1.3 Insurance Requirements: Provide evidence from your insurance company confirming your ability to secure insurance as described in Section 2.17.
  - 4.2.1.4 WCB Requirements: Provide evidence of WCB coverage as described in Section 2.17.
- **4.2.2** Quotation: Quotation is to be provided on the standard quotation template from the Proponent company.
- **4.2.3** Construction Experience
  - 4.2.3.1 Describe your company experience and background complete with a list of three
     (3) similar size projects you've completed in the last two years (2 pages maximum)
- 4.2.4 Project Schedule
  - 4.2.4.1 State when you would be able to start the project and how long you expect it to take to complete.

# 4.3 EVALUATION PROCESS

**4.3.1** Selection of the Successful Proponent pursuant to this RFQ will be made on the basis of the Proponent meeting mandatory requirement, the value of their quotation, additional information requested and other factors germane to the Town of Canmore. The responses shall be evaluated based on the matrix shown below.

Evaluation Criteria	Evaluation
Mandatory Requirements	Pass / Fail
Quotation	100%
Construction Experience	Pass/Fail
Project Schedule	Pass/Fail



**4.3.2** A submission will first be reviewed for compliance with the mandatory requirements of this RFQ as listed above. A submission not complying with the criteria may be considered non-compliant and not receive further consideration.

# 4.4 PROPONENT SHORTLIST

- **4.4.1** .The Town of Canmore reserves the right to shortlist any number of Proponents based on the evaluation of submissions for the criteria outlined in Section 4.2. .
- **4.4.2** Proponents are not guaranteed any paid assignment as a result of being shortlisted via this RFQ. Shortlisted Proponents may be required to undergo an interview prior to final selection of the Successful Proponent.

# 4.5 CONFIDENTIALITY OF EVALUATION

- **4.5.1** Evaluation scores and rankings are confidential, and apart from identifying the top-ranked Proponent, no details of the submission, score or ranking of any Proponent will be released to any Proponent.
- **4.5.2** This procurement is subject to the Candian Free Trade Agreement (207) Chapter Five Government Procurement. The name of the Successful Proponent and the value of the award will be posted on the Alberta Purchasing Connection.

# 4.6 RFQ SCHEDULE

The following schedule has been established for this RFQ:

•	RFQ issued on Town of Canmore website	July 10, 2024
•	Pre-Bid Site Inspection, recommended but non-mandatory	Coordinate Directly with PM
•	Last day to submit questions to Town of Canmore designate	July 22, 2024
•	Last day for Town of Canmore to issue final addendum	J uly 24, 2024
•	RFQ closing	July 31, 2024
•	Letter of award to be issued to Successful Proponent	August 21, 2024
•	Issue contract to Successful Proponent	August 21, 2024

**END OF SECTION 4.0** 



# 5.0 SIGNATURE, ACKNOWLEDGMENT AND WAIVER SHEET

By signing below, the Proponent hereby acknowledges and agrees as follows:

- (a) Prior to submitting its response to this RFQ, the Proponent has obtained from the Town of Canmore and thoroughly reviewed the entirety of the RFQ including all addendums hereto and documents incorporated by reference into this RFQ.
- (b) The Proponent has thoroughly reviewed, understands and agrees to be bound by all terms and conditions of this RFQ including those in all addendums hereto and documents incorporated by reference into this RFQ, unless otherwise waived by the Town of Canmore in its sole discretion and confirmed in writing. The Proponent hereby waives any rights or claims that it was not aware of any document incorporated by reference into this RFQ.
- (c) The Proponent's representative signing below has the full authority to represent the Proponent in all matters relating to the RFQ and bind the Proponent to the terms and conditions of this RFQ.

Name of Business Entity	
Complete Address:	
Phone	Mobile Phone
Fax	Email
Website	
Proponent Signature	Affix Corporate Seal:
Title	
Printed Name	
Date	



i/we acknowledge receipt of	ne following Addenda and have included for the requirements thereof in
my/our RFQ response:	Addendum # to
(Signature)	

# **Notes to Signatories:**

Incorporated Proponents should affix a corporate seal to the signature sheet. If an incorporated Proponent does not have a corporate seal, the Town of Canmore reserves the right to request documentation confirming corporate signing authority in the form of a director's resolution, evidence of current registered officers, or other corporate record.

Unincorporated Proponents must submit proposals signed by individual or legal entity with capacity to execute legal documents and bind the Proponent. The Town of Canmore reserves the right to request documentation confirming individual identities and authority of the signatory to represent the Proponent.



# 6.0 RFQ CHECKLIST

To be included in the RFQ submission:

Evaluation Criteria	Included?
Mandatory Requirements	
Signed signature and waiver sheet	
Signed addendum (addenda) if applicable	
Insurance Requirements: Provide evidence from your insurance company verifying confirming your ability to secure insurance as described in Section 2.17	
WCB Requirements: Provide evidence of WCB coverage as described in Section 2.17.	
Quotation	
Construction Experience - Describe your company experience and background complete with a list of three (3) similar size projects you've completed in the last two years (2 pages maximum)	
Project Schedule - State when you would be able to start the project and how long you expect it to take to complete	



# 7.0 APPENDIX A - REFERENCE DOCUMENTS

CANMORE CIVIC CENTRE COOLING UPGRAGE – MECHANICAL, ELECTRICAL, STRUCTURAL DRAWING LIST IFC and,

CANMORE CIVIC CENTRE MECHANICAL IFT SPECIFICATIONS

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PERMIT TO PRACTICE REMEDY ENGINEERING RM SIGNATURE: Kanjilla RM APEGA ID #: 83084 DATE: 2022-10-24

PERMIT NUMBER: P012329

The Association of Professional Engineers and Geoscientists of Alberta (APEGA)

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#### Part 1: **GENERAL**

#### 1.01 RELATED SECTIONS

- Section 01 33 00 Submittal A.
- В. Section 01 78 00 - Closeout Submittals
- C. Section 20 91 00 – Mechanical Commissioning

#### 1.02 INTENT

- This section covers items common to all Division 20 sections and is intended only to A. supplement the requirements of Division 1.
- B. The intent of this division is to provide all necessary material and labor to provide a complete and functional mechanical system in all aspects, in full compliance with the intent of the drawings and specifications, and applicable codes.
- C. The specifications and drawings of this division are diagrammatic and approximately to scale unless noted otherwise. They establish scope, material, and installation quality and are NOT detailed installation instructions.
- Follow manufacturer's recommended installation details and procedures for equipment D. and products supplemented by the requirements of the drawings and specifications.

#### E. **Definitions**

- .1 As indicated - Means the item is to be as specified or shown on the drawings.
- "Provide", "Furnish", "Fabricate", "Install" unless specifically defined otherwise .2 shall each of these words shall mean to provide material, equipment, and labor to install in accordance with the contract documents.

#### 1.03 REFERENCE STANDARDS

- A. The following is a list of nationally recognized Standards. Conform to these Standards in whole or in part where they are applicable to the work of this division:
  - AABC -- Associated Air Balance Council .1
  - ABC --- Alberta Building Code .2
  - ANSI -- American National Standards Institute .3
  - .4 ASTM -- American Society for Testing of Materials
  - ASHRAE -- American Society of Heating Refrigeration and Air Conditioning .5 Engineers
  - .6 ASME -- American Society of Mechanical Engineers
  - CEMA -- Canadian Electrical Manufacturers Association .7
  - 8. CGA -- Canadian Gas Association
  - .9 CGSB -- Canadian General Standards Board
  - .10 CSA -- Canadian Standards Association
  - .11 FM -- Factory Mutual Engineering Corporation
  - .12 IAO -- Insurer's Advisory Organization of Canada
  - .13 NBC -- National Building Code
  - NFPA -- National Fire Protection Association .14
  - NEMA -- National Electrical Manufacturers Association .15
  - SMACNA -- Sheet Metal and Air Conditioning Contractors National Association .16
  - .17 ULC -- Underwriters Laboratory of Canada

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B. Conform to the latest date or issue of reference standards in effect at the time of submission of bids except where specifically directed otherwise.

### 1.04 PRODUCT OPTIONS AND SUBSTITUTIONS

### A. Definitions:

- .1 Acceptable Materials
  - a A product that is identified as an Acceptable Material shall form part of the specified requirements for its type of product and sets the standard regarding performance, quality of material and workmanship.
  - b In addition to products named in the specification sections as Acceptable Materials, all equipment, fixtures and products named on the mechanical drawings shall be deemed to be Acceptable Materials.
  - c When an Acceptable Material is identified in conjunction with a referenced standard, the requirements set by the Acceptable Material and the referenced standard shall be deemed to supplement each other.
- .2 Acceptable Manufacturers
  - Manufacturers of products listed as Acceptable Manufacturers are acceptable for the purpose of bidding. It is the responsibility of the Contractor to ensure that the product proposed by an Acceptable Manufacturer meets all of the specified requirements for that product.
  - b Contractor shall accept full responsibility for all work to accommodate the products contained in his bid and to ensure they meet all of the requirements specified for those products, including dimensional, technical and performance standards.
- .3 All manufacturers not listed as Acceptable Manufacturers or Acceptable Materials may request to be added to those lists by submitting to the Consultant a written request at least ten (10) working days prior to closing of bids. The request is to include full details and technical information pertaining to the products included in the request.
- .4 If upon review of the request, the Consultant determines that the product meets all requirements for listing as either an Acceptable Manufacturer, or Acceptable Material, the product shall be listed as such by written addendum issued by the Consultant.
- .5 Any products not listed as an Acceptable Manufacturer, or Acceptable Material may be bid as an Alternative only, attached to the Base Bid. All Alternative Bids are subject to review by the Consultant and may be rejected. If rejected, products listed as an Acceptable Manufacturer or Acceptable Materials must be provided.

# 1.05 PROTECTION OF OPENINGS

A. Protect equipment and systems openings from dirt, dust and foreign materials witj materials appropriate to system.

# 1.06 PAINTING

- A. Prime and touch up marred finished painting to match original.
- B. Restore to new condition, finishes which have been damaged too extensively to be merely primed and touched up.

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### 1.07 SHOP DRAWINGS AND PRODUCT DATA

#### A. Shop Drawings:

- Indicate on drawings:
  - Mounting arrangements. а
  - Operating and maintenance clearances.
- .2 Shop drawings and product data accompanied by:
  - Detailed drawings of bases, supports, and anchor bolts.
  - Acoustical sound power data, where applicable. b
  - Points of operation on performance curves. С
  - Manufacturer to certify current model production. d
  - Certification of compliance to applicable codes.
- Review submittals prior to submission to the consultant. This review represents .3 that necessary requirements have been determined and verified, or will be and that each submittal has been checked and co-ordinated with the requirements of the work and the contract documents.
- .4 Shop drawings which do not comply with the requirements herein will be returned without review by consultant.
- .5 Each copy of shop drawing shall be covered by a title sheet and will include the following:
  - Name of Project а
  - Title of shop drawing b
  - Shop drawing number C
  - Description of contents of shop drawing (including Equipment Tag d indicated on drawings)
  - Name and phone number of Contractor's authorized representative е
  - BLANK area no smaller than 200 mm wide x 125 mm high for use by consultant for stamps and review comments
- Work affected by the shop drawing shall be proceed until the shop drawing has .6 been reviewed by the consultant and marked as "reviewed" or "reviewed as noted".
- .7 Comments or corrections made on the shop drawing during this review by the Consultant do not relieve the contractor from compliance with the requirements of the drawings and specifications. This review is for the general conformance with the design concept of the project and general compliance with the information given in the contract documents. The contractor is responsible for confirming and correlating all quantities and dimensions; selecting fabrication processes and techniques of construction; co-ordinating his or her work with that of other trades and performing all work in safe and satisfactory manner.
- 8. Contractor's responsibility for errors and omissions is not relieved by the Consultant's review of the shop drawings.
- Comments or adjustments made on shop drawings by the consultant are not .9 intended to change the contract price. If comments or adjustments affect the value of work, state such in writing to the consultant prior to proceeding with the work.
- .10 Make changes in shop drawings as the consultant request, consistent with contract documents. Revise and re-submit shop drawings when requested by the consultant. When resubmitting, notify the consultant in writing of any revisions other than those requested.

#### **CLOSEOUT SUBMITTALS** 1.08

- A. Operation and Maintenance Data: submit operation and maintenance data for review.
  - Operation data to include:
    - Control schematics for systems including environmental controls. а

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Project: CANMORE CIVIC CENTRE – COOLING UPGRADE

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- b Description of systems and their controls.
- c Description of operation of systems at various loads together with reset schedules and seasonal variances.
- d Operation instruction for systems and component.
- e Description of actions to be taken in event of equipment failure.
- Valves schedule and flow diagram.
- .2 Maintenance data to include:
  - a Servicing, maintenance, operation and trouble-shooting instructions for each item of equipment.
  - b Data to include schedules of tasks, frequency, tools required and task time.
- .3 Performance data to include:
  - Equipment manufacturer's performance datasheets with point of operation as left after commissioning is complete.
  - b Equipment performance verification test results.
  - c Special performance data as specified.
- .4 Site records:
  - General Contractor will provide 1 set of reproducible mechanical drawings. Provide sets of white prints as required for each phase of work. Mark changes as work progresses and as changes occur. Include changes to existing mechanical systems, control systems and low voltage control wiring.
  - b Transfer information weekly to reproducibles, revising reproducibles to show work as actually installed.
  - c Use different colour waterproof ink for each service.
  - d Make available for reference purposes and inspection.
- .5 As-built drawings:
  - Prior to start of Testing, Adjusting and Balancing for HVAC, finalize production of as-built drawings.
  - b Identify each drawing in lower right hand corner in letters at least 12 mm high as follows: - "AS BUILT DRAWINGS: THIS DRAWING HAS BEEN REVISED TO SHOW MECHANICAL SYSTEMS AS INSTALLED" (Signature of Contractor) (Date).
  - c Submit to Consultant for approval and make corrections as directed.
  - d Submit completed reproducible as-built drawings with Operating and Maintenance Manuals.

# 1.09 DELIVERY, STORAGE AND HANDLING

- A. Deliver, store and handle materials in accordance with manufacturer's written instructions.
- B. Delivery and Acceptance Requirements: deliver materials to site in original factory packaging, labelled with manufacturer's name and address.
- C. Storage and Handling Requirements:
  - .1 Store materials off ground, indoors and in dry location and in accordance with manufacturer's recommendations in clean, dry, well-ventilated area.
  - .2 Store and protect equipment from nicks, scratches, and blemishes.
  - .3 Replace defective or damaged materials with new.

# 1.010 FIRE STOPPING

A. Mechanical fire stopping, the responsibility of the mechanical contractor.

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# 1.011 SYSTEM CLEANING

A. Clean interior and exterior of all systems including strainers.

# 1.012 DEMONSTRATION

- A. Supply tools, equipment and personnel to demonstrate and instruct operating and maintenance personnel in operating, controlling, adjusting, trouble-shooting and servicing of all systems and equipment during regular work hours, prior to acceptance.
- B. Use operation and maintenance information and as-built drawings as part of instruction materials.
- C. Instruction duration time requirements as specified in appropriate sections.
- 1.013 LEAVE WORK AREA CLEAN AT END OF EACH DAY.
  - A. Final Cleaning: upon completion remove surplus materials, rubbish, tools and equipment.
- 1.014 PROTECTION
  - A. Protect equipment and systems openings from dirt, dust, and other foreign materials with materials appropriate to system.

Part 2: Products

2.01 NOT USED

Part 3: Execution

3.01 NOT USED

**END OF SECTION** 

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# **General Mechanical Starting & Testing**

Project: CANMORE CIVIC CENTRE – COOLING UPGRADE

Prepared By: Remedy Engineering

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# Part 1: General

1.01 GENERAL

A. This section covers items common to all sections of Mechanical Divisions (Divisions 21, 23 and 25).

1.02 WITNESSING OF TESTS

- A. The Consultant may witness selected starting, testing, adjusting, balancing and cleaning procedures.
- B. Advise the Consultant in advance that starting, testing, adjusting, balancing or cleaning processes are ready to commence. Consult with the Consultant to determine which procedures he may elect to witness. Provide advanced notice prior to commencement of each procedure or series of procedures to allow the consultant to arrange for witnessing of tests.
- 1.03 STARTING AND TESTING COSTS
  - A. Pay costs associated with starting, testing, adjusting, preparation for balancing and cleaning, including supply of instruments, equipment, supplies, and consumable materials.
- 1.04 START-UP REPORTS
  - A. Contractor shall provide start up reports for all equipment.
  - B. All start up reports must be completed and signed off by the contractors and manufacturers representative's.
  - C. The contractor is responsible for completing the check sheets as follows and as indicated on the attached sample:

Technical Data	Specified Data	Consultant
	Shop Drawing	Contractor
	Installed	Contractor
	Verified	Consultant
	Date/Checked by:	Contractor to sign when shop drawing and installed information is completed.
Signatures:		Contractor to sign when the check sheet is completed
Static Checks	Date/Checked by:	Contractor to sign when the items listed and installation of the equipment or systems are complete and ready for the consultant to verify.
Signatures:		Contractor and Consultant to sign when the check sheet is completed.

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# **General Mechanical Starting & Testing**

Project: CANMORE CIVIC CENTRE – COOLING UPGRADE

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### 1.05 REPORTS

- A. Submit Contractor Start-Up Report forms in accordance with Mechanical Equipment/System Startup and Testing documenting starting and testing procedures performed and observed tests results obtained.
- B. Submit field reports in accordance with Mechanical Equipment/System Startup and Testing.

# 1.06 QUALITY ASSURANCE

A. Use personnel for starting, equipment and starting procedures who have experience in mechanical equipment and systems commissioning and are able to interpret results of readings and tests and report state of systems in a clear and concise manner.

### 1.07 MANUFACTURER'S RECOMMENDATIONS

- A. Prior to starting equipment or systems, obtain and review manufacturer's installation, starting and operating instructions. Read in conjunction with procedures specified herein.
- B. Use manufacturer's and supplier's trained personnel where necessary to maintain validity of manufacturer's warranty.
- C. Compare actual installation with manufacturer's recommended installation. Record discrepancies. Correct deviations detrimental to equipment performance prior to starting equipment.

# 1.08 REGULATORY REQUIREMENTS

- A. To facilitate expedient turnover of facility at Interim Acceptance of the Work, arrange for regulatory authorities to witness those specified starting procedures that duplicate tests required by regulatory authorities.
- B. Obtain certificates of approval and for compliance with regulations from authorities having jurisdiction. Include copies of certificates with start-up reports.

# Part 2: Products

Not Used.

### Part 3: Execution

# 3.01 INSPECTION

A. Do not conceal or cover equipment or systems until inspected, tested and approved by Owner.

# 3.02 CHECK SHEETS, FIELD REPORTS AND DATA

- A. Record all data gathered on site on start-up report forms.
- B. Make copies of all starting and testing data before equipment and system start-up personnel leave site. Maintain one copy of all data taken during starting on site.
- C. Maintain one copy of all final starting, testing, adjusting and balancing reports on site up to Substantial Completion of the Work for reference purposes.

# 3.03 COORDINATION

A. Prior to commencement of each particular testing procedure, coordinate all sub-trades, manufacturers, suppliers and other specialties to ensure all phases of work are properly completed. Establish necessary manpower requirements.

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# General Mechanical Starting & Testing Project: CANMORE CIVIC CENTRE – COOLING UPGRADE

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#### 3.04 STARTING AND TESTING PHASES

- A. Starting and testing program generally consists of following five distinct phases:
  - Pre-Starting: visual inspection .1
  - .2 Starting: actual starting procedure.
  - .3 Post-Starting: operational testing, adjusting or balancing and equipment run-in
  - .4 Substantial Completion of the Work: final cleaning, re-testing, and adjusting and maintenance.
  - .5 Final Acceptance of the Work: re-testing and fine-tuning of system to prove all deficiencies have been corrected.

**END OF SECTION** 

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# **Mechanical Equipment Systems Starting & Testing**

Project: CANMORE CIVIC CENTRE – COOLING UPGRADE

Prepared By: Remedy Engineering

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# Part 1: General

# 1.01 GENERAL

A. This section covers items common to all sections of Mechanical Divisions (Divisions 21, 23 and 25).

# 1.02 INTENT

A. Inspect, start and test each piece of mechanical equipment and system. Verify that equipment and systems have been properly installed and are operating at a level that meets specified requirements.

# 1.03 FACTORY TRAINED REPRESENTATIVES

- A. Use factory trained representatives and submit manufacturer's check sheets for starting the chiller and cooling system.
- B. Use manufacturers factory trained personnel where required to maintain manufacturer's warranty.

### Part 2: Execution

### 2.01 AIR CONDITIONING SYSTEMS

### A. Pre-Starting:

- .1 Verify that installation is as drawn and specified and in accordance with manufacturer's recommendations.
- .2 Complete manufacturer's installation and start-up check sheets and include following items on check sheets.
  - a Pipe connections have been correctly made for refrigerant supply and return.
- .3 Unit is installed level and there is positive drainage to the coil drain pan.
- .4 Vibration isolation is aligned.
- .5 Ensure temporary filters are installed. Never operate system without filters installed.
- .6 Ensure all balancing and fire dampers are open and ductwork is complete.
- .7 Ensure electrical connections are complete and system disconnects are within sight of unit.
- .8 Ensure controls are operational.
- .9 Ensure inlet and discharge duct geometry is correct.
- .10 Ensure coils are undamaged and cleaned.

# B. Starting:

.1 Follow manufacturer's recommendations.

# C. Post-Starting:

- .1 Start fan and check for vibration free operation and correct rotation.
- .2 Check for correct static deflection of unit vibration isolators, and that start-up and shut down deflection is within resilience limits.
- .3 Run for one day and check filters, coils, etc. Seal as required.
- .4 Check that bearings are not overheating.
- .5 Check for correct compressor operation.

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# **Mechanical Equipment Systems Starting & Testing**

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- D. Pre-Interim Acceptance:
  - Replace temporary filters with permanent filters.
  - .2 Vacuum clean units.

#### 2.02 MISCELLANEOUS EQUIPMENT - TANKS

- A. Pre-Starting:
  - Verify that installation is as drawn and specified and in accordance with manufacturer's recommendations. Check following:
    - Tank is level on housekeeping base.
    - No visible damage to vessel. b
    - Check PRVs for correct operation and specified relief pressure. Adjust as С required.
    - Clearances have been provided and piping is flanged for easy removal d and servicing.
    - Labels are clearly visible. е
    - Controls, gauges, alarm devices, etc. are operational. f
    - Access ports/manholes provided. g
    - h Piping sizes - inlet/outlet are correct.
    - Lining is intact and not damaged.
    - Tank has dielectric unions on piping connections.
- В. Starting: not applicable.
- C. Post-Starting:
  - Verify operation of: .1
    - Drain line. а
    - Make-up line if applicable. h
- D. Pre-Interim Acceptable: not applicable.

#### 2.03 **OPERATIONAL TESTS**

- A. Operational tests are to be conducted to demonstrate that equipment and systems meet specified performance only after mechanical installations have been completed and pressure tested. Notify the Consultant as soon as conditions permit. Make changes. repairs, adjustments, and replacements required as tests may indicate.
- B. Conduct pre-operational tests, processes and inspections in presence of the Consultant if so requested by the Consultant.
- C. Conduct final operational tests in presence of the Consultant. Vary loads to illustrate start-up and shut down sequences. Simulate emergency conditions for safety shut downs, with automatic and manual reset. Repair and retest defects until satisfactory results are achieved. Make final adjustments to suit exact building conditions.

### **END OF SECTION**

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# **Installation of Pipework**

Project: CANMORE CIVIC CENTRE - COOLING UPGRADE

Prepared By: Remedy Engineering

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# Part 1: General

### 1.01 REFERENCES

- A. Canadian General Standards Board (CGSB)
  - .1 CAN/CGSB-1.181-99, Ready-Mixed Organic Zinc-Rich Coating.
- B. National Fire Code of Canada (NFCC 2005)
- 1.02 ACTION AND INFORMATIONAL SUBMITTALS
  - A. Product Data:
    - .1 Provide manufacturer's printed product literature, specifications and datasheets for piping and equipment and include product characteristics, performance criteria, physical size, finish and limitations.
- 1.03 DELIVERY, STORAGE AND HANDLING
  - A. Delivery and Acceptance Requirements:
    - .1 Deliver materials to site in original factory packaging, labelled with manufacturer's name, address.

# Part 2: Products

- 2.01 MATERIAL
  - A. Fire Stopping: Mechanical contractor responsible for fire proofing new mechanical room wall penetration.

# Part 3: Execution

- 3.01 APPLICATION
  - A. Manufacturer's Instructions: comply with manufacturer's written recommendations, including product technical bulletins, handling, storage and installation instructions, and datasheets.
- 3.02 CONNECTIONS TO EQUIPMENT
  - A. In accordance with manufacturer's instructions unless otherwise indicated.
  - B. Use valves and either unions or flanges for isolation and ease of maintenance and assembly.
  - C. Use double swing joints when equipment mounted on vibration isolation and when piping subject to movement.
- 3.03 CLEARANCES
  - A. Provide clearance around systems, equipment and components for observation of operation, inspection, servicing, maintenance and as recommended by manufacturer.

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# **Installation of Pipework**

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B. Provide space for disassembly, removal of equipment and components as recommended by manufacturer and as indicated without interrupting operation of other system, equipment, components.

### 3.04 DRAINS

- A. Install piping with grade in direction of flow except as indicated.
- Install drain valve at low points in piping systems, at equipment and at section isolating valves.
- C. Pipe each drain valve discharge separately to above floor drain.
  - .1 Discharge to be visible.
- D. Drain valves: NPS 3/4 gate or globe valves unless indicated otherwise, with hose end male thread, cap and chain.

### 3.05 AIR VENTS

- A. Install manual air vents at high points in piping systems.
- B. Install isolating valve at each automatic air valve.
- C. Install drain piping to approved location and terminate where discharge is visible.

### 3.06 PIPEWORK INSTALLATION

- A. Install pipework to CSA B139.
- B. Screwed fittings jointed with Teflon tape.
- C. Protect openings against entry of foreign material.
- D. Install to isolate equipment and allow removal without interrupting operation of other equipment or systems.
- E. Assemble piping using fittings manufactured to ANSI standards.
- F. Saddle type branch fittings may be used on mains if branch line is no larger than half size of main.
  - .1 Hole saw (or drill) and ream main to maintain full inside diameter of branch line prior to welding saddle.
- G. Install exposed piping, equipment, rectangular cleanouts and similar items parallel or perpendicular to building lines.
- H. Install concealed pipework to minimize furring space, maximize headroom, conserve space.
- I. Slope piping, except where indicated, in direction of flow for positive drainage and venting.
- J. Install, except where indicated, to permit separate thermal insulation of each pipe.

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# **Installation of Pipework**

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- K. Group piping wherever possible and as indicated.
- L. Ream pipes, remove scale and other foreign material before assembly.
- M. Use eccentric reducers at pipe size changes to ensure positive drainage and venting.

# N. Valves:

- .1 Install in accessible locations.
- .2 Remove interior parts before soldering.
- .3 Install with stems above horizontal position unless indicated.
- .4 Valves accessible for maintenance without removing adjacent piping.
- .5 Install globe valves in bypass around control valves.
- .6 Use gate or ball valves at branch take-offs for isolating purposes except where specified.
- .7 Install ball valves for glycol service.

# 3.07 SLEEVES

- A. General: install where pipes pass through masonry, concrete structures, fire rated assemblies, and as indicated.
- B. Material: schedule 40 black steel pipe.
- C. Construction: use annular fins continuously welded at mid-point at foundation walls and where sleeves extend above finished floors.
- Sizes: 6 mm minimum clearance between sleeve and uninsulated pipe or between sleeve and insulation.

# E. Installation:

- .1 Concrete, masonry walls, concrete floors on grade: terminate flush with finished surface.
- .2 Other floors: terminate 25 mm above finished floor.
- .3 Before installation, paint exposed exterior surfaces with heavy application of zincrich paint to CAN/CGSB-1.181.

# F. Sealing:

- .1 Foundation walls and below grade floors: fire retardant, waterproof non-hardening mastic.
- .2 Elsewhere:
  - a Provide space for firestopping.
  - b Maintain fire rating integrity.
- .3 Sleeves installed for future use: fill with lime plaster or other easily removable filler.
- .4 Ensure no contact between copper pipe or tube and sleeve.

# 3.08 ESCUTCHEONS

- A. Install on pipes passing through walls, partitions, floors, and ceilings in finished areas.
- B. Construction: one piece type with set screws.
  - .1 Chrome or nickel plated brass or type 302 stainless steel.

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Installation of Pipework
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- C. Sizes: outside diameter to cover opening or sleeve.
  - Inside diameter to fit around pipe or outside of insulation if so provided.

#### 3.09 PREPARATION FOR FIRE STOPPING

- A. Install firestopping within annular space between pipes and adjacent fire separation.
- B. Uninsulated unheated pipes not subject to movement: no special preparation.
- C. Uninsulated heated pipes subject to movement: wrap with non-combustible smooth material to permit pipe movement without damaging fires topping material or installation.
- D. Insulated pipes and ducts: ensure integrity of insulation and vapour barriers.

#### 3.010 FLUSHING OUT OF PIPING SYSTEMS

- Flush all new chilled water piping in accordance with Section 23 08 02 Cleaning and Α. Start-up of Mechanical Piping Systems.
- B. Preparatory to acceptance, clean and refurbish equipment and leave in operating condition, including replacement of filters in piping systems.

**END OF SECTION** 

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# Thermometers and Pressure Gauges

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# Part 1: General

# 1.01 REFERENCES

- A. American Society of Mechanical Engineers (ASME)
  - .1 ASME B40.100-2005, Pressure Gauges and Gauge Attachments.
  - .2 ASME B40.200-2008, Thermometers, Direct Reading and Remote Reading.
- B. Canadian General Standards Board (CGSB)
  - .1 CAN/CGSB-14.4-M88, Thermometers, Liquid-in-Glass, Self-Indicating, Commercial/Industrial Type.
  - .2 CAN/CGSB-14.5-M88, Thermometers, Bimetallic, Self-Indicating, Commercial/Industrial Type.
- C. Efficiency Valuation Organization (EVO)
  - .1 International Performance Measurement and Verification Protocol (IPMVP)
    - a IPMVP 2007 Version.

# 1.02 ACTION AND INFORMATIONAL SUBMITTALS

- A. Product Data:
  - .1 Submit manufacturer's instructions, printed product literature and data sheets for thermometers and pressure gauges and include product characteristics, performance criteria, physical size, finish and limitations.
- 1.03 DELIVERY, STORAGE AND HANDLING
  - A. Delivery and Acceptance Requirements: deliver materials to site in original factory packaging, labelled with manufacturer's name and address.
  - B. Storage and Handling Requirements:
    - .1 Store thermometers and pressure gauges off ground indoors in dry location and in accordance with manufacturer's recommendations in clean, dry, well-ventilated area
    - .2 Store and protect thermometers and pressure gauges from nicks, scratches, and blemishes.
    - .3 Replace defective or damaged materials with new.

# Part 2: Products

- 2.01 ACCEPTABLE MANUFACTURERS
  - A. Terrice, Ashroft, Taylor, and Wekslar
- 2.02 GENERAL
  - A. Design point to be at mid-point of scale or range.
  - B. Ranges: as indicated.

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# Thermometers and Pressure Gauges

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# 2.03 DIRECT READING THERMOMETERS

- A. Industrial, variable angle type, mercury-free, liquid filled, 125 mm scale length: to CAN/CGSB-14.4.
- B. Resistance to shock and vibration.
- C. Basis of Design: Terrice A013.

# 2.04 THERMOMETER WELLS

- A. Copper pipe: copper or bronze.
- B. Steel pipe: brass.

# 2.05 PRESSURE GAUGES

- A. 112 mm, dial type: to ASME B40.100, Grade 2A, stainless steel bourdon tube having 0.5% accuracy full scale unless otherwise specified.
- B. Provide:
  - .1 Snubber for pulsating operation.
  - .2 Diaphragm assembly for corrosive service.
  - .3 Gasketted pressure relief back with solid front.
  - .4 Bronze stop cock.
- C. Basis of Design: Terrice 500x

# Part 3: Execution

# 3.01 GENERAL

- A. Install thermometers and gauges so they can be easily read from floor or platform.
  - .1 If this cannot be accomplished, install remote reading units.
- B. Install between equipment and first fitting or valve.

# 3.02 THERMOMETERS

- A. Install in wells on piping. Include heat conductive material inside well.
- B. Install in locations as indicated and on inlet and outlet of the chiller.
- C. Install wells as indicated only for balancing purposes.
- D. Use extensions where thermometers are installed through insulation.

# 3.03 PRESSURE GAUGES

- A. Install in locations as follows:
  - .1 Inlet and outlet of liquid side of chiller.
- B. Install gauge cocks for balancing purposes, elsewhere as indicated.

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# Thermometers and Pressure Gauges Project: CANMORE CIVIC CENTRE – COOLING UPGRADE

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- C. Use extensions where pressure gauges are installed through insulation.
- 3.04 **NAMEPLATES** 
  - Install engraved lamicoid nameplates in accordance with Section 23 05 53 Mechanical A. Identification, identifying medium.
- **PROTECTION** 3.05
  - A. Protect installed products and components from damage during construction.
  - В. Repair damage to adjacent materials caused by thermometer and gauge installation.

# **END OF SECTION**

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# Part 1: General

# 1.01 REFERENCES

- A. American National Standards Institute (ANSI)/American Society of Mechanical Engineers (ASME)
  - .1 ANSI/ASME B1.20.1-1983(R2006), Pipe Threads, General Purpose (Inch).
  - .2 ANSI/ASME B16.18-2001, Cast Copper Alloy Solder Joint Pressure Fittings.
- B. ASTM International
  - .1 ASTM A276-08, Standard Specification for Stainless Steel Bars and Shapes.
  - .2 ASTM B62-02, Standard Specification for Composition Bronze or Ounce Metal Castings.
  - .3 ASTM B283-08a, Standard Specification for Copper and Copper Alloy Die Forgings (Hot-Pressed).
  - .4 ASTM B505/B505M-08a, Standard Specification for Copper-Base Alloy Continuous Castings.
- C. Manufacturers Standardization Society of the Valve and Fittings Industry, Inc. (MSS)
  - .1 MSS-SP-25-1998, Standard Marking System for Valves, Fittings, Flanges and Unions.
  - .2 MSS-SP-80-2008, Bronze Gate Globe, Angle and Check Valves.
  - .3 MSS-SP-110-1996, Ball Valves, Threaded, Socket-Welding, Solder Joint.

# 1.02 ACTION AND INFORMATIONAL SUBMITTALS

- A. Product Data:
  - .1 Provide manufacturer's printed product literature and data sheets for equipment and systems and include product characteristics, performance criteria, physical size, finish and limitations.
- 1.03 DELIVERY, STORAGE AND HANDLING
  - A. Delivery and Acceptance Requirements:
    - .1 Deliver materials to site in original factory packaging, labelled with manufacturer's name, address.

# Part 2: Products

- 2.01 ACCEPTABLE MANUFACTURERS:
  - A. Butterfly and Ball Valves: Crane, Grinnell, Keystone, Lunkenheimer,
- 2.02 MATERIALS
  - A. Valves:
    - .1 Except for specialty valves, to be single manufacturer.
    - .2 Products to have CRN registration numbers.
  - B. End Connections:
    - .1 Connection into adjacent piping/tubing:
      - a Steel pipe systems: screwed ends to ANSI/ASME B1.20.1.
      - b Copper tube systems: solder ends grooved ends to ANSI/ASME B16.18.

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# C. Lockshield Keys:

1 Where lockshield valves are specified, provide 10 keys of each size: malleable iron cadmium plated.

# D. Ball Valves:

- .1 NPS 2 and under:
  - a Body and cap: cast high tensile bronze to ASTM B62.
  - b Pressure rating: Class125 2760-kPa CWP 4140-kPa CWP, 860 kPa steam.
  - c Connections: screwed ends to ANSI B1.20.1 and with hexagonal shoulders solder ends to ANSI.
  - d Stem: 316 stainless steel with tamperproof ball drive.
  - e Stem packing nut: external to body.
  - f Ball and seat: full port replaceable 316 stainless steel solid ball and Teflon seats.
  - g Stem seal: TFE with external packing nut.
  - h Operator: removable lever handle.

# E. Butterfly Valves

- .1 NPS 2 ½ and Over:
  - a Except to specialty valves, to be single manufacturer.
  - b To be suitable for dead end service.
  - c CRN registration number required for products.
  - d Pressure rating for tight shut-off at temperatures up to maximum for seat material
    - .1 All sizes: 200 psig
  - e Minimum seat temperature ratings to 135°C
  - f Application: on-off operation
  - g Full lug body (threaded)
  - h Operators:
    - .1 NPS 2-3: Handles capable of locking in a minimum of ten (10) positions 0 to 90 Deg. Handle and release trigger ductile iron. Return spring and hinge pin: carbon steel. Latch plate and mounting hardware: cadium plated carbon steel.
    - .2 NPS 4 and over: Manual enclosed gear operator.
  - Designed to comply with MSS SP-67 and API 609
  - j Compatible with ANSI Class 125/Class 150 flangers
  - k Construction:
    - .1 Body: cast iron or ductile iron
    - .2 Disc: aluminum bronze
    - .3 Seat: EPDM
    - .4 Shaft: Stainless steel
    - .5 Tape pin: Type 316 stainless steel
    - .6 O-Ring: Buna-N or EPDM
    - .7 Bushings: Lubricated bronze or Teflon

# I Acceptable Materials:

- .1 Crane fig. 44 BXZ
- .2 Grinnell series 1000L
- .3 Keystone 222 Series
- .4 Lunkenheimer series 500

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# **Valves**

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# Part 3: Execution

# 3.01 INSTALLATION

- A. Install rising stem valves in upright position with stem above horizontal.
- B. Remove internal parts before soldering.
- C. Install valves with unions at each piece of equipment arranged to allow servicing, maintenance, and equipment removal.
- D. Valve Schedule:
  - .1 Equipment Isolation: NPS 2 & under Ball, NPS 2 ½ and over Butterfly
  - .2 Air Vent Isolation: Ball
  - .3 Equipment Drains: Ball with hose bib and cap

**END OF SECTION** 

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Project: CANMORE CIVIC CENTRE – COOLING UPGRADE Prepared By: Remedy Engineering

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# Part 1: General

# 1.01 REFERENCES

- A. American Society of Mechanical Engineers (ASME)
  - .1 ASME B31.1-07, Power Piping.
- B. ASTM International
  - .1 ASTM A125-1996(2007), Standard Specification for Steel Springs, Helical, Heat-Treated.
  - .2 ASTM A307-07b, Standard Specification for Carbon Steel Bolts and Studs, 60,000 PSI Tensile Strength.
  - .3 ASTM A563-07a, Standard Specification for Carbon and Alloy Steel Nuts.
- C. Factory Mutual (FM)
- D. Manufacturer's Standardization Society of the Valves and Fittings Industry (MSS)
  - .1 MSS SP58-2002, Pipe Hangers and Supports Materials, Design and Manufacture.
  - .2 MSS SP69-2003, Pipe Hangers and Supports Selection and Application.
  - .3 MSS SP89-2003, Pipe Hangers and Supports Fabrication and Installation Practices.
- E. Underwriter's Laboratories of Canada (ULC)
- 1.02 ACTION AND INFORMATIONAL SUBMITTALS
  - A. Provide submittals in accordance with Section 01 33 00 Submittal Procedures.
- 1.03 CLOSEOUT SUBMITTALS
  - A. Provide maintenance data for incorporation into manual specified in Section 01 78 00 Closeout Submittals.
- 1.04 DELIVERY, STORAGE AND HANDLING
  - A. Deliver, store and handle materials in accordance with manufacturer's written instructions.
  - B. Delivery and Acceptance Requirements:
    - .1 Deliver materials to site in original factory packaging, labelled with manufacturer's name, address.

# Part 2: Products

- 2.01 SYSTEM DESCRIPTION
  - A. Design Requirements:
    - .1 Construct pipe hanger and support to manufacturer's recommendations utilizing manufacturer's regular production components, parts and assemblies.
    - .2 Base maximum load ratings on allowable stresses prescribed by ASME B31.1 or MSS SP58.

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- .3 Design hangers and supports to support systems under conditions of operation, allow free expansion and contraction, prevent excessive stresses from being introduced into pipework or connected equipment.
- .4 Provide for vertical adjustments after erection and during commissioning. Amount of adjustment in accordance with MSS SP58.

# 2.02 GENERAL

A. Fabricate hangers, supports and sway braces in accordance with MSS SP58.

# 2.03 PIPE HANGERS

# A. Finishes:

- .1 Pipe hangers and supports galvanized after manufacture.
- .2 Use electro-plating galvanizing process.
- .3 Ensure steel hangers in contact with copper piping are copper plated.
- B. Upper attachment structural: suspension from lower flange of I-Beam:
  - .1 Cold piping NPS 2 maximum malleable iron C-clamp with hardened steel cup point setscrew, locknut carbon steel retaining clip.
    - .1 Rod: 9 mm UL listed.
  - .2 Cold piping NPS 2 1/2 or greater, hot piping: malleable iron beam clamp, eye rod, jaws and extension with carbon steel retaining clip, tie rod, nuts and washers, UL listed.
- C. Upper attachment structural: suspension from upper flange of I-Beam:
  - .1 Cold piping NPS 2 maximum ductile iron top-of-beam C-clamp with hardened steel cup point setscrew, locknut and carbon steel retaining clip, UL listed.
  - .2 Cold piping NPS 2 1/2 or greater, hot piping: malleable iron top-of-beam jaw-clamp with hooked rod, spring washer, plain washer and nut UL listed FM approved.
- D. Upper attachment to concrete:
  - .1 Ceiling: carbon steel welded eye rod, clevis plate, clevis pin and cotters with weldless forged steel eye nut. Ensure eye 6 mm minimum greater than rod diameter.
  - .2 Concrete inserts: wedge shaped body with knockout protector plateUL listed to MSS SP69.
- E. Hanger rods: threaded rod material to MSS SP58:
  - .1 Ensure that hanger rods are subject to tensile loading only.
  - .2 Provide linkages where lateral or axial movement of pipework is anticipated.
  - .3 Do not use 22 mm or 28 mm rod.
- F. Pipe attachments: material to MSS SP58:
  - .1 Attachments for steel piping: carbon steel galvanized.
  - .2 Attachments for copper piping: copper plated black steel.
  - .3 Use insulation shields for hot pipework.
  - .4 Oversize pipe hangers and supports.
- G. Adjustable clevis: material to MSS SP69 UL listed, clevis bolt with nipple spacer and vertical adjustment nuts above and below clevis.
- H. Yoke style pipe roll: carbon steel yoke, rod and nuts with cast iron roll, to MSS SP69.

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- I. U-bolts: carbon steel to MSS SP69 with 2 nuts at each end to ASTM A563.
  - Finishes for steel pipework: galvanized.
  - Finishes for copper, glass, brass or aluminum pipework: galvanized, with formed .2 portion plastic coated.
- J. Hangers within the pool areas to be constructed from stainless steel suitable for use in an environment with elevated humidity and chlorine levels.
- K. All safety-critical load bearing components in the pool environment specified in stainless steel must be resistant to Stress Corrosion Cracking (SCC) to prevent premature failure caused by chlorine containing compounds in the air as well as splash zones. This applies to all structural and secondary structural stainless steel elements considered critical load bearing of items such as but not limited to: Rod bar supports and hangers for piping and equipment including all associated bolts and fasteners. Common SS grades such as 316, 304, 201 and 321 cannot be used for critical load bearing components. Stainless steel grades must contain high Molybdenum such as 6% or more to prevent SCC. The supplier of the stainless steel product and product data must explicitly indicate the proposed steel grade is resistant to Stress Corrosion Cracking.

### 2.04 RISER CLAMPS

- Α. Steel or cast iron pipe: galvanized carbon steel to MSS SP58, type 42, UL listed.
- В. Copper pipe: carbon steel copper plated to MSS SP58, type 42.
- C. Bolts: to ASTM A307.
- D. Nuts: to ASTM A563.

### 2.05 INSULATION PROTECTION SHIELDS

- A. Piping NPS 1-1/4 to NPS 2: galvanized protection shield with high density insulation under shield with uninterrupted vapour barrier.
  - Acceptable Material; Grinnell fig 167
- В. Piping NPS 2-1/2 and over: Galvanized protective saddle with insulation under saddle.
  - Acceptable Material: Grinnell fig 160 to 166

### 2.06 CONSTANT SUPPORT SPRING HANGERS

- A. Springs: alloy steel to ASTM A125, shot peened, magnetic particle inspected, with +/-5% spring rate tolerance, tested for free height, spring rate, loaded height and provided with Certified Mill Test Report (CMTR).
- B. Load adjustability: 10% minimum adjustability each side of calibrated load. Adjustment without special tools. Adjustments not to affect travel capabilities.
- C. Provide upper and lower factory set travel stops.
- D. Provide load adjustment scale for field adjustments.
- E. Total travel to be actual travel + 20%. Difference between total travel and actual travel 25 mm minimum.

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F. Individually calibrated scales on each side of support calibrated prior to shipment, complete with calibration record.

# 2.07 EQUIPMENT ANCHOR BOLTS AND TEMPLATES

A. Provide templates to ensure accurate location of anchor bolts.

# Part 3: Execution

# 3.01 MANUFACTURER'S INSTRUCTIONS

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

# 3.02 INSTALLATION

- A. Install in accordance with:
  - .1 Manufacturer's instructions and recommendations.
- B. Vibration Control Devices:
  - .1 Install on piping systems at pumps, boilers, chillers, cooling towers, and as indicated.
- C. Clamps on riser piping:
  - .1 Support independent of connected horizontal pipework using riser clamps and riser clamp lugs welded to riser.
  - .2 Bolt-tightening torques to industry standards.
  - .3 Steel pipes: install below coupling or shear lugs welded to pipe.
  - .4 Cast iron pipes: install below joint.
- D. Clevis plates:
  - .1 Attach to concrete with 4 minimum concrete inserts, one at each corner.
- E. Provide supplementary structural steelwork where structural bearings do not exist or where concrete inserts are not in correct locations.
- F. Use approved constant support type hangers where:
  - .1 Vertical movement of pipework is 13 mm or more,
  - .2 Transfer of load to adjacent hangers or connected equipment is not permitted.

# 3.03 HANGER SPACING

A. Within 300 mm of each elbow.

Maximum Pipe Size: NPS	Maximum Spacing Steel	Maximum Spacing Copper	Rod Diameter
up to 1-1/4	2.1 m	1.8 m	10mm
1-1/2	2.4 m	2.1 m	2.4 m
2	3.0 m	2.7 m	2.4 m
2-1/2	3.6 m	3.0 m	3.0 m
3	3.6 m	3.0 m	3.0 m
3-1/2	3.9 m	3.0 m	3.3 m

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4	4.8 m	3.3 m	16 mm
5	4.8 m	3.3 m	16 mm
6	5.1 m	3.3 m	22 mm
8	5.7 m	3.3 m	22 mm
10	6.6 m	3.3 m	22 mm
12 and over	6.7 m	3.3 m	22 mm

# 3.04 HANGER INSTALLATION

- A. Install hanger so that rod is vertical under operating conditions.
- B. Adjust hangers to equalize load.
- C. Support from structural members. Where structural bearing does not exist or inserts are not in suitable locations, provide supplementary structural steel members.

# 3.05 HORIZONTAL MOVEMENT

- A. Angularity of rod hanger resulting from horizontal movement of pipework from cold to hot position not to exceed 4 degrees from vertical.
- B. Where horizontal pipe movement is less than 13 mm, offset pipe hanger and support so that rod hanger is vertical in the hot position.

# 3.06 FINAL ADJUSTMENT

- A. Adjust hangers and supports:
  - .1 Ensure that rod is vertical under operating conditions.
  - .2 Equalize loads.
- B. Adjustable clevis:
  - .1 Tighten hanger load nut securely to ensure proper hanger performance.
  - .2 Tighten upper nut after adjustment.
- C. C-clamps:
  - .1 Follow manufacturer's recommended written instructions and torque values when tightening C-clamps to bottom flange of beam.
- D. Beam clamps:
  - .1 Hammer jaw firmly against underside of beam.

# **END OF SECTION**

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# **Vibration Controls for HVAC Piping & Equipment**

Project: CANMORE CIVIC CENTRE – COOLING UPGRADE

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# Part 1: General

## 1.01 SUMMARY

- A. Section Includes:
  - .1 Vibration isolation materials and components, seismic control measures and their installation.

# 1.02 REFERENCES

- A. Health Canada/Workplace Hazardous Materials Information System (WHMIS)
  - .1 Material Safety Data Sheets (MSDS).
- B. National Fire Protection Association (NFPA)
  - .1 NFPA 13-2002, Standard for the Installation of Sprinkler Systems.
- C. National Building Code of Canada (NBC) 1995

# 1.03 QUALITY ASSURANCE

- A. Health and Safety:
  - Do construction occupational health and safety in accordance with Section 01 35 29.06 Health and Safety Requirements.

# Part 2: Products

## 2.01 GENERAL

A. Size and shape of bases type and performance of vibration isolation as indicated.

# 2.02 ELASTOMERIC PADS

- A. Type EP1 neoprene waffle or ribbed; 9mm minimum thick; 50 durometer; maximum loading 350 kPa.
- B. Type EP2 rubber waffle or ribbed; 9 mm minimum thick; 30 durometer natural rubber; maximum loading 415 kPa.
- C. Type EP3 neoprene-steel-neoprene; 9mm thick neoprene bonded to 1.71 mm steel plate; 50 durometer, waffle or ribbed; holes sleeved with isolation washers; maximum loading 350 kPa.
- D. Type EP4 rubber-steel-rubber; 9 mm minimum thick rubber bonded to 1.71 mm steel plate; 30 durometer natural rubber, waffle or ribbed; holes sleeved with isolation washers; maximum loading 415 kPa.

# Part 3: Execution

# 3.01 MANUFACTURER'S INSTRUCTIONS

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

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# Vibration Controls for HVAC Piping & Equipment Project: CANMORE CIVIC CENTRE – COOLING UPGRADE

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### 3.02 **INSTALLATION**

- A. Install vibration isolation equipment in accordance with manufacturers instructions and adjust mountings to level equipment.
- Ensure piping, ducting and electrical connections to isolated equipment do not reduce B. system flexibility and that piping, conduit and ducting passage through walls and floors do not transmit vibrations.

### 3.03 **ISOLATION SCHEDULE**

Equipment Description	Equipment No.	Isolation	Deflection Type	Comments Static (mm)
Chiller	All	EP-2	_	Chiller to be supplied with spring isolators

**END OF SECTION** 

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Project: CANMORE CIVIC CENTRE - COOLING UPGRADE

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# Part 1: General

## 1.01 SUMMARY

- A. Section Includes:
  - .1 Materials and requirements for the identification of piping systems, duct work, valves and controllers, including the installation and location of identification systems.

# 1.02 REFERENCES

- A. Canadian Gas Association (CGA)
  - .1 CSA/CGA B149.1-05, Natural Gas and Propane Installation Code.
- B. Canadian General Standards Board (CGSB)
  - .1 CAN/CGSB-1.60-97, Interior Alkyd Gloss Enamel.
  - .2 CAN/CGSB-24.3-92, Identification of Piping Systems.
- C. National Fire Protection Association (NFPA)
  - .1 NFPA 13-2002, Standard for the Installation of Sprinkler Systems.

# 1.03 ACTION AND INFORMATIONAL SUBMITTALS

- A. Product Data:
- B. Product data to include paint colour chips, other products specified in this section.

# Part 2: Products

# 2.01 MANUFACTURER'S EQUIPMENT NAMEPLATES

- Metal or plastic laminate nameplate mechanically fastened to each piece of equipment by manufacturer.
- B. Lettering and numbers raised or recessed.
- C. Information to include, as appropriate:
  - .1 Equipment: manufacturer's name, model, size, serial number, capacity.
  - .2 Motor: voltage, Hz, phase, power factor, duty, frame size.

# 2.02 SYSTEM NAMEPLATES

- A. Colours:
  - .1 Hazardous: red letters, white background.
  - .2 Elsewhere: black letters, white background (except where required otherwise by applicable codes).
- B. Construction:
  - .1 3 mm thick laminated plastic white anodized aluminum, matte finish, with square corners, letters accurately aligned and machine engraved into core.

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# C. Sizes:

.1 Conform to following table:

Size # mm	Sizes (mm)	No. of Lines	Height of Letters (mm)
1	10 x 50	1	3
2	13 x 75	1	5
3	13 x 75	2	3
4	20 x 100	1	8
5	20 x 100	2	5
6	20 x 200	1	8
7	25 x 125	1	12
8	25 x 125	2	8
9	35 x 200	1	20

.2 Use maximum of 25 letters/numbers per line.

# D. Locations:

- .1 Terminal cabinets, control panels: use size # 5.
- .2 Equipment in Mechanical Rooms: use size # 9.

# 2.03 IDENTIFICATION OF PIPING SYSTEMS

A. Identify contents by background colour marking, pictogram (as necessary), legend; direction of flow by arrows. To CAN/CGSB 24.3 except where specified otherwise.

# B. Pictograms:

.1 Where required: Workplace Hazardous Materials Information System (WHMIS) regulations.

# C. Legend:

.1 Block capitals to sizes and colours listed in CAN/CGSB 24.3.

# D. Arrows showing direction of flow:

- .1 Outside diameter of pipe or insulation less than 75 mm: 100 mm long x 50 mm high.
- .2 Outside diameter of pipe or insulation 75 mm and greater: 150 mm long x 50 mm high.
- .3 Use double-headed arrows where flow is reversible.

# E. Extent of background colour marking:

- .1 To full circumference of pipe or insulation.
- .2 Length to accommodate pictogram, full length of legend and arrows.

# F. Materials for background colour marking, legend, arrows:

- .1 Pipes and tubing 20 mm and smaller: waterproof and heat-resistant pressure sensitive plastic marker tags.
- .2 Other pipes: pressure sensitive plastic-coated cloth or vinyl with protective overcoating, waterproof contact adhesive undercoating, suitable for ambient of 100% RH and continuous operating temperature of 150°C and intermittent temperature of 200°C.

# G. Colours and Legends:

.1 Where not listed, obtain direction from consultant.

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.2 Colours for legends, arrows: to following table:

Background colour: Legend, arrows:

Yellow BLACK Green WHITE Red WHITE

.3 Background colour marking and legends for piping systems:

Contents Background colour Legend

marking

Chilled Water Supply Green Ch. Water Supply Chilled Water Return Green Ch. Water Return

# 2.04 LANGUAGE

A. Identification in English.

# Part 3: Execution

# 3.01 MANUFACTURER'S INSTRUCTIONS

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

# 3.02 TIMING

A. Provide identification only after painting specified Section 09 90 00 - Painting has been completed.

# 3.03 INSTALLATION

A. Perform work in accordance with CAN/CGSB-24.3 except as specified otherwise.

# 3.04 NAMEPLATES

- A. Locations:
  - .1 In conspicuous location to facilitate easy reading and identification from operating floor.
- B. Standoffs:
  - .1 Provide for nameplates on hot and/or insulated surfaces.
- C. Protection:
  - .1 Do not paint, insulate or cover.

# 3.05 LOCATION OF IDENTIFICATION ON PIPING AND DUCTWORK SYSTEMS

- A. On long straight runs in open areas in mechanical rooms: at not more than 17 m intervals and more frequently if required to ensure that at least one is visible from any one viewpoint in operating areas and walking aisles.
- B. Adjacent to each change in direction.

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- C. At least once in each small room through which piping or ductwork passes.
- D. On both sides of visual obstruction or where run is difficult to follow.
- E. On both sides of separations such as walls, floors, partitions.
- F. At beginning and end points of each run and at each piece of equipment in run.
- G. At point immediately upstream of major manually operated or automatically controlled valves, and dampers. Where this is not possible, place identification as close as possible, preferably on upstream side.
- H. Identification easily and accurately readable from usual operating areas and from access points.
  - Position of identification approximately at right angles to most convenient line of sight, considering operating positions, lighting conditions, risk of physical damage or injury and reduced visibility over time due to dust and dirt.

**END OF SECTION** 

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### Part 1: General

### 1.01 **SUMMARY**

### A. Section Includes:

Thermal insulation for piping and piping accessories in commercial type applications.

### 1.02 **REFERENCES**

- Α. American Society of Heating, Refrigeration and Air Conditioning Engineers (ASHRAE)
  - ASHRAE Standard 90.1-01, Energy Standard for Buildings except Low-Rise Residential Buildings (IESNA co-sponsored; ANSI approved; Continuous Maintenance Standard).
- В. American Society for Testing and Materials International (ASTM)
  - ASTM B209M-04, Standard Specification for Aluminum and Aluminum Alloy Sheet and Plate Metric.
  - ASTM C335-04, Standard Test Method for Steady State Heat Transfer .2 Properties of Horizontal Pipe Insulation.
  - .3 ASTM C411-04, Standard Test Method for Hot-Surface Performance of High-Temperature Thermal Insulation.
  - .4 ASTM C449/C449M-00, Standard Specification for Mineral Fiber-Hydraulic-Setting Thermal Insulating and Finishing Cement.
  - .5 ASTM C533-2004, Calcium Silicate Block and Pipe Thermal Insulation.
  - ASTM C547-2003, Mineral Fiber Pipe Insulation. .6
  - ASTM C795-03, Standard Specification for Thermal Insulation for Use in Contact .7 with Austenitic Stainless Steel.
  - ASTM C921-03a, Standard Practice for Determining the Properties of Jacketing 8. Materials for Thermal Insulation.
- C. Canadian General Standards Board (CGSB)
  - CGSB 51-GP-52Ma-89, Vapour Barrier, Jacket and Facing Material for Pipe, Duct and Equipment Thermal Insulation.
  - .2 CAN/CGSB-51.53-95, Poly (Vinyl Chloride) Jacketing Sheet, for Insulated Pipes, Vessels and Round Ducts
- D. Department of Justice Canada (Jus)
  - Canadian Environmental Assessment Act (CEAA), 1995, c. 37. .1
  - Canadian Environmental Protection Act (CEPA), 1999, c. 33. .2
  - .3 Transportation of Dangerous Goods Act (TDGA), 1992, c. 34.
- E. Health Canada/Workplace Hazardous Materials Information System (WHMIS)
  - Material Safety Data Sheets (MSDS).
- F. Manufacturer's Trade Associations
  - Thermal Insulation Association of Canada (TIAC): National Insulation Standards (Revised 2004).
- G. Underwriters' Laboratories of Canada (ULC)
  - CAN/ULC-S102-03, Surface Burning Characteristics of Building Materials and .1 Assemblies.
  - .2 CAN/ULC-S701-01, Thermal Insulation, Polystyrene, Boards and Pipe Covering.
  - .3 CAN/ULC-S702-1997, Thermal Insulation, Mineral Fibre, for Buildings

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CAN/ULC-S702.2-03, Thermal Insulation, Mineral Fibre, for Buildings, Part 2: .4 Application Guidelines.

### 1.03 **DEFINITIONS**

- A. For purposes of this section:
  - "CONCEALED" insulated mechanical services in suspended ceilings and non-.1 accessible chases and furred-in spaces.
  - .2 "EXPOSED" - will mean "not concealed" as specified.
- B. TIAC:
  - .1 CRF: Code Rectangular Finish.
  - .2 CPF: Code Piping Finish.

### 1.04 **QUALITY ASSURANCE**

- Qualifications: A.
- В. Installer: specialist in performing work of this Section and have at least 3 years successful experience in this size and type of project.
- 1.05 DELIVERY, STORAGE AND HANDLING
  - A. Packing, shipping, handling and unloading:
    - Deliver, store and handle in accordance with manufacturer's written instructions.
    - .2 Deliver, store and handle materials in accordance with manufacturer's written instructions.
    - .3 Deliver materials to site in original factory packaging, labelled with manufacturer's name, address.
  - B. Storage and Protection:
    - .1 Protect from weather, construction traffic.
    - .2 Protect against damage.
    - .3 Store at temperatures and conditions required by manufacturer.

### Part 2: **Products**

- 2.01 FIRE AND SMOKE RATING
  - A. In accordance with CAN/ULC-S102.
    - .1 Maximum flame spread rating: 25.
    - .2 Maximum smoke developed rating: 50.
- 2.02 **INSULATION** 
  - A. Mineral fibre specified includes glass fibre, rock wool, slag wool.
  - В. Thermal conductivity ("k" factor) not to exceed specified values at 24°C mean temperature when tested in accordance with ASTM C335.
  - C. TIAC Code A-3: rigid moulded mineral fibre with factory applied vapour retarder jacket.
    - Mineral fibre: to CAN/ULC-S702. .1
    - Jacket: to CGSB 51-GP-52Ma. .2
    - Maximum "k" factor: to CAN/ULC-S702. .3

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### 2.03 INSULATION SECUREMENT

- A. Tape: self-adhesive, aluminum, plain reinforced, 50 mm wide minimum.
- B. Contact adhesive: quick setting.
- C. Canvas adhesive: washable.
- D. Tie wire: 1.5 mm diameter stainless steel.
- E. Bands: stainless steel, 19mm wide, 0.5 mm thick.

### 2.04 **CEMENT**

- Thermal insulating and finishing cement: A.
  - Air drying on mineral wool, to ASTM C449/C449M.

### VAPOUR RETARDER LAP ADHESIVE 2.05

A. Water based, fire retardant type, compatible with insulation.

### 2.06 **JACKETS**

- A. Polyvinyl Chloride (PVC):
  - One-piece moulded type and sheet to CAN/CGSB-51.53 with pre-formed shapes .1 as required.
  - .2 Colours: White
  - .3 Minimum service temperatures: -20°C.
  - .4 Maximum service temperature: 65°C.
  - .5 Moisture vapour transmission: 0.02 perm.
  - .6 Fastenings:
    - Use solvent weld adhesive compatible with insulation to seal laps and а joints.
    - b Tacks.
    - Pressure sensitive vinyl tape of matching colour. С

### B. Aluminium:

- To ASTM B209 and without moisture barrier 1
- .2 Thickness: 0.50 mm sheet
- .3 Finish: Smooth
- .4 Joining: Longitudinal and circumferential slip joints with 50 mm laps
- .5 Fittings: 0.5 mm thick die-shaped fitting covers with factory-attached protective
- .6 Metal jacket banding and mechanical seals: stainless steel, 19 mm wide, 0.5 mm thick at 300 mm spacing.

### Part 3: Execution

### 3.01 MANUFACTURER'S INSTRUCTIONS

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

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### 3.02 PRE-INSTALLATION REQUIREMENT

- Pressure testing of piping systems and adjacent equipment to be complete, witnessed Α. and certified.
- В. Surfaces clean, dry, free from foreign material.

### 3.03 **INSTALLATION**

- Α. Install in accordance with TIAC National Standards.
- В. Apply materials in accordance with manufacturer's instructions and this specification.
- C. Use two layers with staggered joints when required nominal wall thickness exceeds 75
- D. Maintain uninterrupted continuity and integrity of vapour retarder jacket and finishes.
  - Install hangers, supports outside vapour retarder jacket.
- E. Supports, Hangers:
  - Apply high compressive strength insulation, suitable for service, at oversized saddles and shoes where insulation saddles have not been provided.

### 3.04 PIPING INSULATION SCHEDULES

- A. Includes valves, valve bonnets, strainers, flanges and fittings unless otherwise specified.
- B. TIAC Code: A-3
  - .1 Securements: Tape at 300 mm on centre.
  - .2 Seals: VR lap seal adhesive, VR lagging adhesive.
  - .3 Installation: TIAC Code: 1501-C.
- C. Thickness of insulation as listed in following table.
  - Run-outs to individual units and equipment not exceeding 4000 mm long. .1
  - .2 Do not insulate exposed runouts to plumbing fixtures, chrome plated piping, valves, fittings.

Application	Temp	TIAC	Pipe sizes (NPS and insulation thickness mm)					
Application	°C	code	Run outs	To 1"	1 to 11/4	1½ to 3"	4 to 6	8 & over
Chilled Water	4-13	A-3	25 mm	25 mm	25 mm	25 mm	25 mm	25 mm

- D. Finishes:
  - Exposed outdoors: aluminium. .1
  - .2 Exposed in mechanical rooms: PVC jacket.
  - .3 Concealed, indoors: canvas on valves, fittings. No further finish.
  - .4 Use vapour retarder jacket on TIAC code A-3 insulation compatible with insulation.
  - .5 Installation: to appropriate TIAC code CRF/1 through CPF/5.

### 3.05 **CLEANING**

A. Upon completion and verification of performance of installation, remove surplus materials, excess materials, rubbish, tools and equipment.

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# Thermal Insulation for Piping Project: CANMORE CIVIC CENTRE – COOLING UPGRADE Prepared By: Remedy Engineering

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### 3.06 **JACKETING**

- Apply recovery material over all exposed insulation:
  .1 Indoor Piping: PVC A.

  - Outdoor Piping: Aluminium .2

**END OF SECTION** 

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# **Hydronic Systems Steel**

Project: CANMORE CIVIC CENTRE - COOLING UPGRADE

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# Part 1: General

# 1.01 REFERENCES

- A. American National Standards Institute/American Water Works Association (ANSI/AWWA)
  - .1 ANSI/AWWA C111/A21.11-06, Standard for Rubber-Gasket Joints for Ductile-Iron Pressure Pipe and Fittings.
- B. American Society of Mechanical Engineers (ASME)
  - .1 ASME B16.1-10 Gray Iron Pipe Flanges and Flanged Fittings: Classes 25, 125, and 250.
  - .2 ASME B16.3-06, Malleable Iron Threaded Fittings: Classes 150 and 300.
  - .3 ASME B16.5-09, Pipe Flanges and Flanged Fittings: NPS through NPS 24 Metric/Inch Standard.
  - .4 ASME B16.9-07, Factory-Made Wrought Buttwelding Fittings.
  - .5 ASME B18.2.1-10, Square Hex, Heavy Hex and Askew Head Bolts and Hex, Heavy Hex, Hex Flange. Loded Head and Lag Screws (Inch Series).
  - .6 ASME B18.2.2-10, Nuts for General Applications: Machine Screw Nuts, Hex, Square, Hex Flange, and Coupling Nuts (Inch Series).

# C. ASTM International

- .1 ASTM A47/A47M-99(2009), Standard Specification for Ferritic Malleable Iron Castings.
- .2 ASTM A53/A53M-10, Standard Specification for Pipe, Steel, Black and Hot-Dipped, Zinc Coated Welded and Seamless.
- .3 ASTM B62-09, Standard Specification for Composition Bronze or Ounce Metal Castings.
- .4 ASTM E202-10, Standard Test Method for Analysis of Ethylene Glycols and Propylene Glycols.

# D. CSA International

- .1 CSA B242-05(R2011), Groove and Shoulder Type Mechanical Pipe Couplings.
- .2 CSA W48-06, Filler Metals and Allied Materials for Metal Arc Welding.
- E. Manufacturer's Standardization of the Valve and Fittings Industry (MSS)
  - .1 MSS-SP-67-2002a, Butterfly Valves.
  - .2 MSS-SP-70-06, Gray Iron Gate Valves, Flanged and Threaded Ends.
  - .3 MSS-SP-71-05, Gray Iron Swing Check Valves Flanged and Threaded Ends.
  - .4 MSS-SP-80-08, Bronze Gate, Globe, Angle and Check Valves.
  - 5 MSS-SP-85-02, Gray Iron Globe and Angle Valves, Flanged and Threaded Ends.

# 1.02 ACTION AND INFORMATIONAL SUBMITTALS

# A. Product Data:

.1 Submit manufacturer's instructions, printed product literature and data sheets for hydronic systems and include product characteristics, performance criteria, physical size, finish and limitations.

# 1.03 DELIVERY, STORAGE AND HANDLING

A. Delivery and Acceptance Requirements: deliver materials to site in original factory packaging, labelled with manufacturer's name and address.

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# **Hydronic Systems Steel**

Project: CANMORE CIVIC CENTRE - COOLING UPGRADE

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- B. Storage and Handling Requirements:
  - .1 Store materials off ground indoors in dry location and in accordance with manufacturer's recommendations in clean, dry, well-ventilated area.
  - .2 Replace defective or damaged materials with new.

# Part 2: Products

- 2.01 CHILLED WATER ABOVE GRADE
  - A. Steel pipe: to ASTM A53/A53M, Schedule 40, 10 mm wall for sizes 300mm and over, black.
  - B. Fittings: ASTM B16.3, malleable iron or ASTM A234, forged steel welding type fittings.
- 2.02 PIPE JOINTS
  - A. NPS 2 and under: welded or screwed fittings with PTFE tape
  - B. NPS 2-1/2 and over: welding fittings and flanges to CSA W48.
  - C. Flanges: plain, slip-on, weld neck and to ANSI/AWWA C111/ A21.11.
  - D. Orifice flanges: slip-on raised face, 2100 kPa.
  - E. Flange gaskets: to ANSI/AWWA C111/ A21.11.
  - F. Pipe thread: taper.
  - G. Bolts and nuts: to ASME B18.2.1.
- 2.03 FITTINGS
  - A. Screwed fittings: malleable iron, to ASME B16.3, Class 150.
  - B. Pipe flanges and flanged fittings:
    - .1 Cast iron: to ASME B16.1, Class 125.
    - .2 Steel: to ASME B16.5.
  - C. Butt-welding fittings: steel, to ASME B16.9.
  - D. Unions: malleable iron, to ASTM A47/A47M.
- 2.04 VALVES
  - A. See section 23 05 23.

# Part 3: Execution

- 3.01 PIPING INSTALLATION
  - A. Install pipework in accordance with Section 23 05 05 Installation of Pipe Work.
- 3.02 CLEANING, FLUSHING AND START-UP
  - A. In accordance with Section 23 08 02 Cleaning and Start-Up of Mechanical Piping Systems.

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# **Hydronic Systems Steel**

Project: CANMORE CIVIC CENTRE – COOLING UPGRADE

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3.03 **TESTING** 

- A. Test system in accordance with Section 23 05 95 - Pressure Testing of Piping Systems
- В. For glycol systems, retest with propylene glycol to ASTM E202, inhibited, for use in building system after cleaning. Repair leaking joints, fittings or valves.
- 3.04 **GLYCOL CHARGING** 
  - A. System to be charged with 50% glycol.
  - B. Retest for concentration to ASTM E202 after cleaning.
  - C. Refer to Section 23 25 00 HVAC Water Treatment Systems.
- 3.05 PERFORMANCE VERIFICATION
  - In accordance with Section 23 08 01 Performance Verification Mechanical Piping A. Systems.

# **END OF SECTION**

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### Part 1: General

### 1.01 REFERENCES

### **ASME** A.

ASME Boiler and Pressure Vessel Code (BPVC), Section VII-2013. .1

### В. **ASTM International**

- ASTM A47/A47M-99(2009), Standard Specification for Ferritic Malleable Iron Castinas.
- .2 ASTM A278/A278M-01(2011), Standard Specification for Gray Iron Castings for Pressure-Containing Parts for Temperatures up to 650 degrees F (350 degrees C).
- ASTM A516/A516M-10, Standard Specification for Pressure Vessel Plates, .3 Carbon Steel, for Moderate - and Lower - Temperature Service.
- ASTM A536-84(2009), Standard Specification for Ductile Iron Castings. .4
- ASTM B62-09, Standard Specification for Composition Bronze or Ounce Metal .5 Castings.

### C. CSA Group

CSA B51-09. Boiler. Pressure Vessel, and Pressure Piping Code.

### 1.02 **ACTION AND INFORMATIONAL SUBMITTALS**

### A. Product Data:

Submit manufacturer's instructions, printed product literature and data sheets for .1 expansion tanks, air vents, separators, valves, and strainers and include product characteristics, performance criteria, physical size, finish and limitations.

### 1.03 **CLOSEOUT SUBMITTALS**

A. Operation and Maintenance Data: submit operation and maintenance data for hydronic specialties for incorporation into manual.

### 1.04 DELIVERY, STORAGE AND HANDLING

- Delivery and Acceptance Requirements: deliver materials to site in original factory Α. packaging, labelled with manufacturer's name and address.
- B. Storage and Handling Requirements:
  - Store materials off ground, indoors, in dry location and in accordance with manufacturer's recommendations in clean, dry, well-ventilated area.
  - .2 Store and protect hydronic specialties from nicks, scratches, and blemishes.
  - Replace defective or damaged materials with new. .3

### Part 2: **Products**

### 2.01 ACCEPTABLE MANUFACTURERS

- A. Expansion Tanks: Hamlet & Garneau, Taco, Armstrong, Expanflex.
- В. Automatic Air Vents: Maid-O-Mist, Watts, Armstrong.

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### 2.02 DIAPHRAGM TYPE EXPANSION TANK

- A. Vertical steel pressurized diaphragm type expansion tank.
- В. Capacity: as indicated.
- C. Size: as indicated.
- D. Diaphragm sealed in elastomer suitable for 115°C temperature.
- E. Working pressure: 860 kPa with ASME stamp and certification 520 kPa.
- F. Air precharged to 84 kPa (initial fill pressure of system).
- G. Base mount for vertical installation.

### 2.03 AUTOMATIC AIR VENT

- Α. Standard float vent: brass body and NPS 1/8 connection and rated at 690 kPa working pressure.
- Industrial float vent: cast iron body and NPS 1/2 connection and rated at 860 kPa working B. pressure.

### 2.04 MANUAL AIR VENTS

- A. Construct manual air vents from short vertical section of NPS 2 pipe to form air chamber. Provide NPS 1/4 ball valve at top of chamber.
- В. Provide inverted U-bend discharge tubing terminating downward near vent.

### 2.05 HYDRONIC SYSTEM FEEDER

- A. System shall include 208 litre (55 US gallon) storage/mixing tank with cover; pump suction hose with inlet strainer; pressure pump with thermal cut-out; integral pressure switch; integral check valve; cord and plug; pre-charged accumulator tank with EPDM diaphragm; manual diverter valve for purging air and agitating contents of storage tank; pressure regulating valve adjustable (35 - 380 kPa; 5-55 PSIG) complete with pressure gauge; built-in check valve; union connection; 12 mm (1/2") x 900 mm (36") long flexible connection hose with check valve; low level pump cut-out. Pressure pump shall be capable of running dry without damage. Power supply 115/60/1 0.7 A. Unit shall be completely pre-assembled and certified by a recognized testing agency to CSA standard C22.2 No. 68.
- В. Basis of Design: Axiom SF100.

### 2.06 FLEXIBLE CONNECTION

- Maximum offset: 10 mm on each side of installed centre line. A.
- B. Minimum length in accordance with manufacturer's recommendations to suit maximum offset specified.
- C. Diameter and type of end connection: to match connecting pipework.

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Hydronic Specialties
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- D. Operating conditions:
  - Working pressure: 862 kPa. .1
  - .2 Working temperature: 121°C
- E. Steel Piping:
  - Inner Hose: Stainless Steel.
  - .2 Exterior Sleeve: Single braided stainless steel.
- F. Acceptable Materials: Senior Flexonics BSN/PCS/BSF Series.

### Part 3: Execution

### 3.01 **APPLICATION**

A. Manufacturer's Instructions: comply with manufacturer's written recommendations, including product technical bulletins, handling, storage and installation instructions, and data sheets.

### 3.02 **GENERAL**

- A. Run drain lines and blow off connections to terminate above nearest drain.
- B. Maintain adequate clearance to permit service and maintenance.
- C. Check shop drawings for conformance of tappings for ancillaries and for equipment operating weights.
- 3.03 **STRAINERS** 
  - A. Install in location shown.
- 3.04 AIR VENTS
  - Α. Provide manual type at system high points.
  - В. Install isolation valve on float type air vent inlet.
  - C. Where large air quantities can accumulate, provide enlarged air collection standpipes.

### 3.05 **FLEXIBLE CONNECTIONS**

- A. Install flexible connections in accordance with manufacturer's instructions.
- В. Install flexible connections on chiller.

# **END OF SECTION**

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# HVAC Water Treatment Systems Project: CANMORE CIVIC CENTRE – COOLING UPGRADE

Prepared By: Remedy Engineering

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### Part 1: General

### 1.01 REFERENCES

- **ASME** A.
  - ASME Boiler and Pressure Vessel Code (BPVC), Section VII-2013. .1
- В. Health Canada/Workplace Hazardous Materials Information System (WHMIS)
  - Material Safety Data Sheets (MSDS).
- 1.02 **ACTION AND INFORMATIONAL SUBMITTALS** 
  - A. **Product Data:** 
    - Submit manufacturer's instructions, printed product literature and data sheets for HVAC water treatment systems and include product characteristics, performance criteria, physical size, finish and limitations.
- 1.03 **CLOSEOUT SUBMITTALS** 
  - A. Operation and Maintenance Data: submit operation and maintenance data for HVAC water treatment systems for incorporation into manual.
  - В. Include following:
    - Log sheets as recommended by manufacturer
- 1.04 DELIVERY, STORAGE AND HANDLING
  - A. Delivery and Acceptance Requirements: deliver materials to site in original factory packaging, labelled with manufacturer's name and address.
  - В. Storage and Handling Requirements:
    - Store materials off ground indoors in dry location and in accordance with manufacturer's recommendations in clean, drv. well-ventilated area.
    - .2 Store and protect HVAC water treatment systems from nicks, scratches, and blemishes.
    - .3 Replace defective or damaged materials with new.

### Part 2: **Products**

- 2.01 **MANUFACTURER** 
  - A. Equipment, chemicals, and service provided by one supplier.
- 2.02 CLOSED LOOP HYDRONIC SYSTEMS
  - A. Scope: Chilled Water System
  - В. System Cleaner: neutral pH multi-metal system cleaner for removing rust, oil-based coatings and organic debris.
    - Acceptable Material: BetzDearborn Ferroquest 7103.
  - C. Corrosion Inhibiter: Molybdate-based for use in multi-metal recirculating water systems to control pH level, scale and sludge and inhibit corrosion.
    - Acceptable Martierl: BetzDearborn Corrshield MD4102.

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# HVAC Water Treatment Systems Project: CANMORE CIVIC CENTRE – COOLING UPGRADE

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### 2.03 **GLYCOL**

Glycol system to be filled with 50% propylene glycol 50% distilled water complete with Α. inhibitors. Glycol to be virgin glycol, not recycled.

### Part 3: **Execution**

### 3.01 MANUFACTURER'S INSTRUCTIONS

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

### 3.02 **INSTALLATION**

- A. Install HVAC water treatment systems in accordance with ASME Boiler and Pressure Code Section VII, and requirements and standards of authorities having jurisdiction, except where specified otherwise.
- В. Ensure adequate clearances to permit performance of servicing and maintenance of equipment.

### 3.03 CLEANING OF MECHANICAL SYSTEM

- Provide copy of recommended cleaning procedures and chemicals for approval by Α. consultant.
- B. Flush new chilled water piping and equipment with approved cleaning chemicals designed to remove deposition from construction such as pipe dope, oils, loose mill scale and other extraneous materials. Use chemicals to inhibit corrosion of various system materials that are safe to handle and use.
- C. Examine and clean filters and screens, periodically during circulation of cleaning solution, and monitor changes in pressure drop across equipment.
- D. Drain and flush systems until alkalinity of rinse water is equal to make-up water. Refill with clean water treated to prevent scale and corrosion during system operation.
- E. Disposal of cleaning solutions approved by authority having jurisdiction.

# **END OF SECTION**

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Project: CANMORE CIVIC CENTRE – COOLING UPGRADE

Prepared By: Remedy Engineering

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# Part 1: General

# 1.01 SUMMARY

A. Section includes design, performance criteria, refrigerants, controls, and installation requirements for air-cooled scroll compressor chillers.

# 1.02 REFERENCES

- A. Comply with applicable Standards/Codes of AHRI 550/590, ANSI/ASHRAE 15, ETL, cETL, NEC, and OSHA as adopted by the State.
- B. Units shall meet the efficiency standards of the current version of ASHRAE Standard 90.1, and FEMP standard 2012.

# 1.03 SUBMITTALS

- A. Submit shop drawings and product data in accordance with the specifications.
- B. Submittals shall include the following:
  - .1 Dimensioned plan and elevation view drawings, required clearances, and location of all field connections
  - .2 Summary of all auxiliary utility requirements such as electricity, water, etc. Summary shall indicate quality and quantity of each required utility.
  - .3 Single line schematic drawing of the field power hookup requirements, indicating all items that are furnished.
  - .4 Schematic diagram of control system indicating points for field interface/connection.
  - .5 Diagram shall fully delineate field and factory wiring.
  - .6 Installation and operating manuals.

# 1.04 QUALITY ASSURANCE

- A. Qualifications: Equipment manufacturer must specialize in the manufacture of the products specified and have five years' experience with the type of equipment and refrigerant offered.
- B. Regulatory Requirements: Comply with the codes and standards specified.
- C. Chiller manufacturer plant must be ISO Registered.

# 1.05 DELIVERY AND HANDLING

- A. Chiller shall be delivered to the job site completely assembled and charged with refrigerant and oil by the manufacturer.
- B. Comply with the manufacturer's instructions for rigging and handling equipment.

# 1.06 WARRANTY

A. Standard Warranty (Canada): The refrigeration equipment manufacturer's guarantee shall be for a period of one year from date of equipment start-up but not more than 18 months from shipment. The guarantee shall provide for repair or replacement due to

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Project: CANMORE CIVIC CENTRE – COOLING UPGRADE

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failure by material and workmanship that prove defective within the above period, excluding refrigerant

- B. 1st Year Labor Warranty: Entire unit
- C. Extended Compressor Warranty: None.
- D. Extended Unit Warranty: None.
- E. Refrigerant Warranty: None.
- F. Delay Warranty Start: None.

# 1.07 MAINTENANCE

A. Maintenance of the chillers shall be the responsibility of the owner and performed in accordance with the manufacturer's instructions.

# Part 2: Products

# 2.01 ACCEPTABLE MANUFACTURERS

- A. Basis of Design: Carrier
- B. Acceptable Manufacturers: Daikin, Carrier, York, Dunham Bush

# 2.02 equipment

# A. General

.1 Factory assembled, single piece chassis, air cooled liquid chiller. Contained within the unit cabinet shall be all factory wiring, piping, controls, refrigerant charge (R-410A) and special features required prior to field start up.

# B. Unit Cabinet

- .1 The base rail is industrial quality, 7ga, zinc dipped, galvanized frame (with Magnicoated screws.)
- .2 Cabinet shall be galvanized steel casing with baked enamel powder or prepainted finish.
- .3 Painted parts shall withstand 1,000 hours in constant neutral salt spray under ASTM B117 conditions with 1 mm scribe per ASTM D1654. After test, painted parts shall show no signs of wrinkling or cracking, no loss of adhesion, no evidence of blistering and the mean creepage shall not exceed ¼ in. (Rating = 4 per ASTM D1654) on either side of the scribe line.

# C. Fans

- .1 Condenser fans shall be direct driven, 9 blade airfoil cross section, reinforced polymer construction, shrouded axial type and shall be statically and dynamically balanced with inherent corrosion resistance.
- .2 Air shall be discharged vertically upward.
- .3 Fans shall be protected by coated steel wire safety guards.

# D. Compressor/Compressor Assembly

- .1 Fully hermetic scroll type compressors.
- .2 Direct drive, 3,500 RPM (60 Hz), protected by motor temperature sensors, suction gas cooled motor.

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Project: CANMORE CIVIC CENTRE - COOLING UPGRADE

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- .3 External vibration isolation rubber in shear.
- .4 Each compressor shall be equipped with crank case heaters to minimize oil dilution.

# E. Cooler

- .1 Shell and tube type, direct expansion.
- .2 Tubes shall be internally enhanced seamless copper type rolled into tube sheets.
- .3 Shall be equipped with Victaulic type water connections.
- .4 Shell shall be insulated with  $\frac{3}{4}$  in (19 mm) PVC foam (closed cell) with a maximum K factor of 0.28
- .5 Design shall incorporate a minimum of 2 independent direct expansion refrigerant circuits.
- .6 Cooler shall be tested and stamped in accordance with ASME Code for refrigerant working side pressure of 445 PSIG (3,062 kPa). Cooler shall have maximum water side pressure of 300 PSIG (2,068 kPa).
- .7 Cooler shall be provided with a factory installed flow switch.

# F. Condenser

- Coil shall be air cooled Novation® heat exchanger technology with microchannel (MCHX) coils and shall have a series of flat tubes containing a series of multiple, parallel flow microchannels layered between the refrigerant manifolds. Coils shall consist of a two pass arrangement. Coil construction shall consist of aluminium alloys for fins, tubes and manifolds in combination with a corrosion resistant coating.
- .2 Tubes shall be cleaned, dehydrated and sealed.
- .3 Assembled condenser coils shall be leak tested and pressure tested at 656 PSIG (4,522 kPa).

# G. Refrigeration Components

1 Refrigerant circuit components shall include replaceable core filter drier, moisture indicating sight glass, electronic expansion device, discharge service valve and liquid line service valves and complete operating charge of both refrigerant R-410A and compressor oil.

# H. Controls, Safeties and Diagnostics

- .1 Unit controls shall include the following minimum components:
  - a Microprocessor with non-volatile memory. Battery backup system shall not be accepted.
  - b Separate terminal block for power and controls.
  - c Control transformer to serve all controllers, relays and controls components.
  - d ON/OFF control switch.
  - e Replaceable solid state controllers.
  - Pressure sensors shall be installed to measure suction and discharge pressure. Thermistors shall be installed to measure cooler entering and leaving fluid temperatures as well as optional heat reclaim condenser entering and leaving fluid temperatures and refrigerant pump down pressure and temperature.
- .2 Unit controls shall include the following functions:
  - a Automatic circuit lead/lag
  - b Hermetic scroll compressors are maintenance free and protected by an auto adaptive control that minimizes compressor wear.
  - c Capacity control based on leaving chilled fluid temperature and compensated by rate of change of return fluid temperature with temperature set point accuracy to 0.1°F (0.06°C).

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- d Limiting the chilled fluid temperature pull down rate at start up to an adjustable range of 0.2°F to 2°F (0.11°C to 1.1°C) per minute to prevent excessive demand spike at start up.
- e Seven day time schedule.
- f Leaving chilled fluid temperature reset from return fluid and outside air temperature.
- g Chilled water pump and optional heat reclaim condenser water pump start/stop control and primary/standby sequencing to ensure equal pump run time.
- h Dual chiller control for parallel chiller applications without addition of hardware modules and controls panels (additional thermistors and wells are required.)
- i Timed maintenance scheduling to signal maintenance activities for pumps, strainer maintenance and user defined maintenance activities.
- j Low ambient protection to energize cooler and optional heat reclaim or hydronic system heaters.
- k Periodic pump start to ensure pumps seals are properly maintained during off season periods.
- I Single step demand limit control activated by remote contact closure.
- m Night time sound mode to reduce the sound of the machine by a user defined schedule.

# .3 Diagnostics

- The control panel shall include, as standard, a scrolling marquee display capable of indicating the safety lockout condition by displaying a code for which an explanation may be scrolled at the display with time and date stamp.
- b Information included for display shall be:
  - .1 Compressor Lockout
  - .2 Loss of Charge
  - .3 Low Fluid Flow
  - .4 Cooler Coil Freeze Protection
  - .5 Cooler Setpoint
  - .6 Chilled Water Reset Parameters
  - .7 Thermistor and Transducer Malfunction
  - .8 Entering and Leaving Fluid Temperature
  - .9 Evaporator and Condenser Pressure
  - .10 System Refrigerant Temperatures
  - .11 Chiller Run Hours
  - .12 Compressor Run Hours
  - .13 Compressor Number of Starts
  - .14 Time of Day
    - a Display module, in conjunction with the microprocessor, must also be capable of displaying the output (results) of a service test. Service test shall verify operation of every switch, thermistor, fan and compressor before chiller is started.
    - b Diagnostics shall include the ability to review a list of the 30 most recent alarms with clear language descriptions of the alarm event. Display of alarm codes without the ability for clear language descriptions shall be prohibited.
    - c An alarm history buffer shall allow the user to store no less than 30 alarm events with clear language descriptions, time and date stamp event entry.
    - d The chiller control shall include multiple connection ports for communicating with the local equipment network, the

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Carrier Comfort Network® (CCN) system and access to chiller control functions from any point on the chiller.

- e The control system shall allow software upgrade without the need for new hardware modules.
- .15 Crank case heater failure.

# .4 Safeties

- a Unit shall be equipped with thermistors and all necessary components in conjunction with the control system to provide the unit with the following protections:
  - .1 Loss of refrigerant charge.
  - .2 Reverse rotation.
  - .3 Low chilled fluid temperature.
  - .4 Thermal overload.
  - .5 High pressure.
  - .6 Electrical overload.
- b Condenser fan factory pump motor shall have external over current protection.

# I. Operating Characteristics

- .1 Unit shall be capable of starting and running at outdoor ambient temperatures from 32°F to 125°F (0°C to 52°C) for all sizes.
- .2 Unit shall be capable of starting up with 95°F (35°C) entering fluid temperature to the cooler.

# J. Motors

.1 Condenser fan motors shall be totally enclosed single speed, 3 phased type with permanently lubricated bearings and Class F insulation.

# K. Electrical Requirements

- .1 Unit/module primary electrical power supply shall enter the unit at a single location (some chiller voltage/size combinations require 2 power supplies).
- .2 Unit shall operate on 3 phase power at the voltage shown in the equipment schedule.
- .3 Control points shall be accessed through terminal block.
- .4 Unit shall be shipped with factory control and power wiring installed.

# L. Chilled Water Circuit

.1 Chilled water circuit shall be rate for 300 PSIG (2,068 kPa)

# M. Special Features

- .1 Low Ambient Head Pressure Control
  - Unit shall be capable of running at outdoor ambient temperatures down to -20°F (-29°C) with the addition of antifreeze in the cooler circuit, wind baffles and factory installed solid state head pressure control with condenser coil minimum step capacity temperature sensor.
- .2 Unit Mounted Non-fused Disconnect
  - Unit shall be supplied with factory installed, non-fused electrical disconnect for main power supply. This option is not available on 30RB060-120 with dual point power. This option is included with the high SCCR option.
- .3 Optional Condenser Coil Materials
  - a E-coated Microchannel Coils
    - .1 E-coated aluminum microchannel coil shall have a flexible epoxy polymer coating uniformly applied to all coil external surface areas without material bridging between fins or louvres. Coating process shall ensure complete coil encapsulation, including all

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exposed fin edges. E-coat shall have a thickness of 0.8 to 1.2 mil with top coat having a uniform dry film thickness from 1.0 to 2.0 mil on all external coil surface areas including fin edges. E-coated coils shall have superior hardness characteristics of 2H per ASTM D3363-00 and cross hatch adhesion of 4B-5B per ASTM D3369-02. Impact resistance shall be up to 160 in/lb (ASTM D2794-93). E-coated coil shall have superior impact resistance with no cracking, chipping or peeling per NSF/ANSI 51-2002 Method 10.2 E-coated aluminum microchannel coils shall be capable of withstanding an 8,000 hour salt spray test in accordance with the ASTM (American Society for Testing and Materials) (USA) B-117 Standard.

# .4 Minimum Load Control

- Units shall be equipped with factory installed, microprocessor controlled, minimum load control that shall permit unit operation down to a minimum of 6% capacity (varies with unit size). This option is not available on applications with leaving fluid temperature less than 38°F (3.3°C).
- .5 Energy Management Control Module
  - A factory installed module shall provide the following energy management capabilities: 4 to 20 mA signals for leaving fluid temperature reset, cooling set point reset or demand limit control; 2 step demand limit control (from 2%-100%) activated by a remote contact closure and discrete input for "ice Done" indication for ice storage system interface.
- .6 Condenser Coil Trim Panels
  - Unit shall be supplied with factory installed coil covers and painted grilles to protect the condenser coil and internal chiller components from physical damage.
- .7 Security Grilles
  - Unit shall be supplied with factory installed coil covers and painted grilles to protect the condenser coil and internal chill components from physical damage.
- .8 Upper Hail Guard
  - Unit shall be equipped with a factory installed option consisting of louvered panels on the ends of the machine which firmly fasten to the machine frame. These panels shall cover the unit from the top to the bottom of the coils, thus providing protection of the coils from hail damage.
- .9 Compressor Suction Service Valve
  - a Standard refrigerant discharge isolation and liquid valves shall enable service personnel to store the refrigerant charge in the cooler or condenser during servicing. This factory installed option (one valve per refrigerant circuit) shall allow for further isolation of the compressor from the cooler vessel.
- .10 Freeze Protection Cooler Heaters
  - Cooler heaters shall provide protection from cooler freeze up to -20°F (-29°C).
- .11 CRN Cooler
  - a Shall provide minor cooler modifications to meet Canadian code.
- .12 Compressor Sound Reduction
  - a Shall provide sound reduction for the scroll compressors.
    - .1 Unit shall be equipped with factory installed option ultra low sound compressor sound reduction enclosure which provides an enclosure to encase each compressor that is covered with an acoustic blanket.

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Air Cooled Chillers
Project: CANMORE CIVIC CENTRE – COOLING UPGRADE

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#### Part 3: **Execution**

#### 3.01 **INSTALLATION**

- A. Install in strict accordance with manufacturer's requirements, shop drawings, and contract documents.
- В. Adjust and level chiller in alignment on supports.
- C. Coordinate electrical installation with electrical contractor.
- D. Coordinate controls with control contractor.
- E. Install a field-supplied or optional manufacturer-supplied strainer in the chilled water return line at the evaporator inlet that meets manufacturer perforation size specifications.

#### 3.02 START-UP

A. Provide testing and starting of machine and instruct the Owner in its proper operation and maintenance.

**END OF SECTION** 

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#### **EMCS General Requirements**

Project: CANMORE CIVIC CENTRE - COOLING UPGRADE

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#### Part 1: General

#### 1.01 SUMMARY

- A. Section Includes:
  - .1 General requirements for building Energy Monitoring and Control System (EMCS) that are common to NMS EMCS Sections.

#### 1.02 REFERENCES

- A. American National Standards Institute (ANSI)/The Instrumentation, Systems and Automation Society (ISA).
  - .1 ANSI/ISA 5.5- 1985, Graphic Symbols for Process Displays.
- B. American National Standards Institute (ANSI)/ Institute of Electrical and Electronics Engineers (IEEE).
  - .1 ANSI/IEEE 260.1- 1993, American National Standard Letter Symbols Units of Measurement (SI Units, Customary Inch-Pound Units, and Certain Other Units).
- C. American Society of Heating, Refrigerating and Air-Conditioning Engineers, Inc. (ASHRAE).
  - .1 ASHRAE STD 135- R2001, BACNET Data Communication Protocol for Building Automation and Control Network.
- D. Canadian Standards Association (CSA International).
  - .1 CAN/CSA-Z234.1- 89(R1995), Canadian Metric Practice Guide.
- E. Consumer Electronics Association (CEA).
  - .1 CEA-709.1- B-2002, Control Network Protocol Specification.
- F. Department of Justice Canada (Jus).
  - .1 Canadian Environmental Assessment Act (CEAA), 1995, c. 37.
  - .2 Canadian Environmental Protection Act (CEPA), 1999, c. 33.
- G. Electrical and Electronic Manufacturers Association (EEMAC).
  - .1 EEMAC 2Y-1- 1958, Light Gray Colour for Indoor Switch Gear.
- H. Health Canada/Workplace Hazardous Materials Information System (WHMIS).
  - .1 Material Safety Data Sheets (MSDS).
- I. Transport Canada (TC).
  - .1 Transportation of Dangerous Goods Act (TDGA), 1992, c. 34.

#### 1.03 APPROVED CONTROLS CONTRACTOR

A. **Convergint Technologies** is the only approved EMCS controls vendor.

#### 1.04 SYSTEM DESCRIPTION

- A. Work covered by sections referred to above consists of fully operational EMCS, including, but not limited to, following:
  - .1 Control devices as listed in I/O point summary tables.
  - .2 Complete operating and maintenance material.
  - .3 Training of personnel.

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#### **EMCS General Requirements**

Project: CANMORE CIVIC CENTRE - COOLING UPGRADE

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- .4 Acceptance tests, technical support during commissioning, full documentation.
- .5 Wiring interface co-ordination of equipment supplied by others.
- .6 Miscellaneous work as specified in these sections and as indicated.
- B. Design Requirements:
  - 1 Design and provide conduit and wiring linking elements of system.

#### Part 2: Products

2.01 NOT USED

#### Part 3: Execution

#### 3.01 BMS CONTROL SEQUENCES

- A. Provide data base for all points and all virtual (pseudo) points required for the Custom Control Programs.
- B. Provide Custom Control programs for mechanical equipment and using logic, routines and techniques.

#### 3.02 CHILLED WATER SYSTEM

- A. Related Equipment: New Chiller CH-1, existing Chilled Water Pumps
- B. The chilled water system will be enabled when the outdoor temperature is above 18°C (adjustable) and at least 3 zones are calling for cooling.
- C. The run status of the chiller will enable the chilled water circulation pump.
- D. The chilled water supply temperature setpoint is sent to the chiller when the chilled water is running, the chiller is to be enabled.
- E. Alarms: all analog temperature and pressure sensors will trigger an alarm at the HIGH or LOW alarm condition, as defined in the system database.
- F. Chilled water loop temperature to be controlled as follows:

O/A Temp	30°C	18°C
CHWS	7.2°C	10°C
CHWR	12.7°C	15.5°C

- G. Tie into the chillers BACnet communication card for complete control of chiller.
- H. The minimum flow as measured by a inline flow measuring station chilled water bypass valve to modulate to maintain minimum flow as measured by the flow sensor.
- I. The VFD will modulate pump speed as measured by a remote pressure sensor to measure differential pressure.

#### **END OF SECTION**

Mechanical Specification Page 2 of 2

# CANMORE CIVIC CENTER COOLING UPGRADE

TOWN OF CANMORE

REM PROJECT NO. 22-042



OCTOBER 24, 2022

# DRAWING LIST

MECHANICAL

M1 MECHANICAL KEY PLAN

M2 MECHANICAL DEMOLITION PLAN

M3 MECHANICAL RENOVATION PLAN & SCHEMATIC

M4 MECHANICAL ROOF PLAN, DETAILS & SCHEDULES

ELECTRICAL

E0.0 ELECTRICAL COVER SHEET

E1.0 ELECTRICAL FLOOR PLANS

M2.0 ELECTRICAL SPECIFICATIONS

STRUCTURAL

S1 STRUCTURAL KEY PLAN, PARTIAL PLANS, CROSS-SECTIONS & GENERAL NOTES

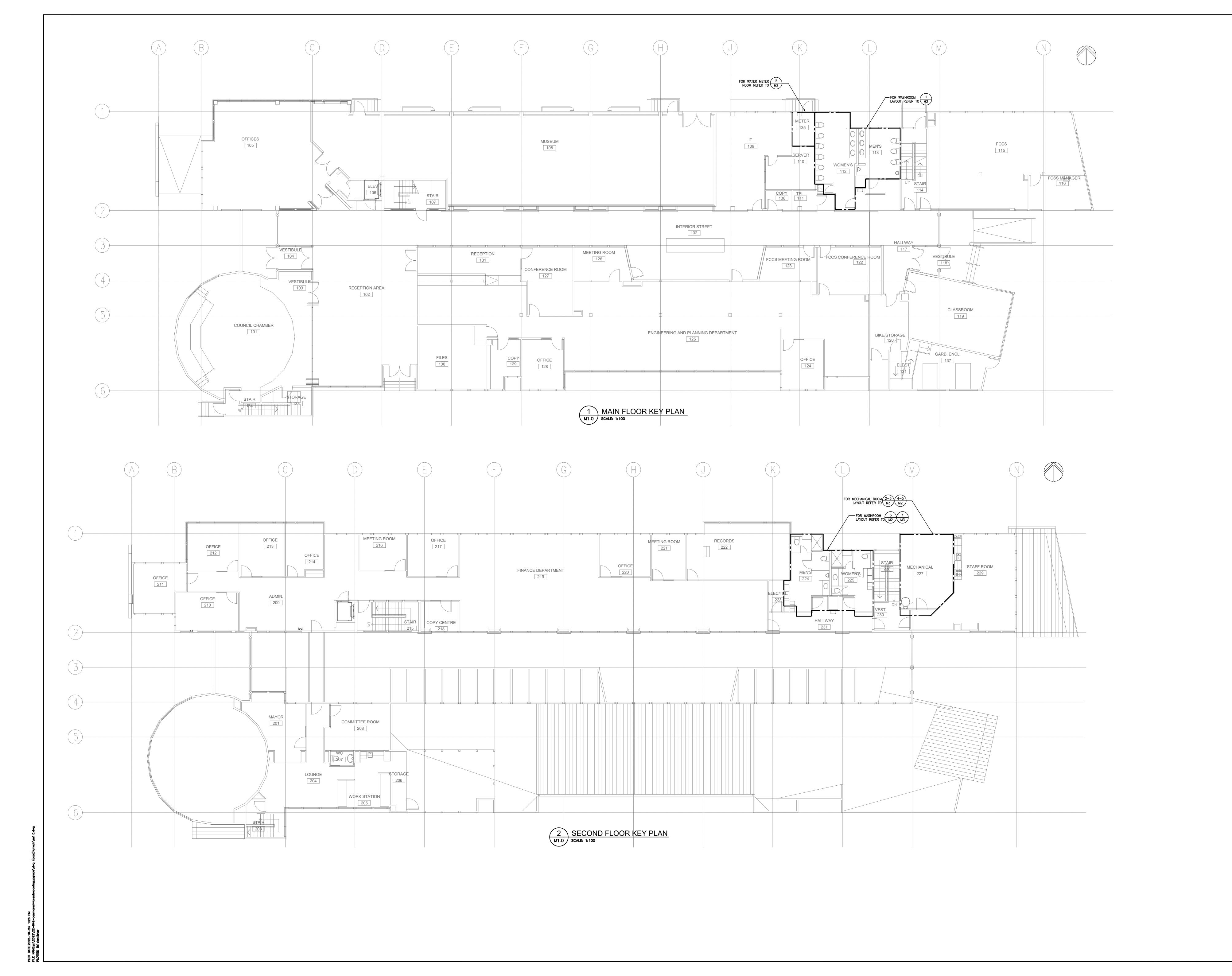
# CONTACTS

MECHANICAL ENGINEER - REMEDY ENGINEERING

JEFF SWART - PHONE: 403-984-6951 ALAN LISTER - PHONE: 587-328-7163









ENGINEERING

T: 403.984.6960 200, 1422 Kensington Rd. NW Calgary, AB T2N 3P9

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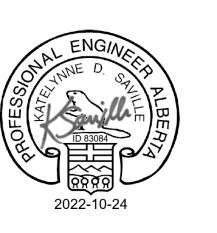
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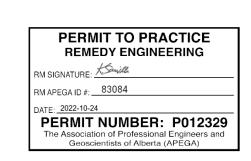
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2	ISSUED FOR 90% REVIEW	2022-05-02
3	ISSUED FOR FINAL REVIEW	2022-05-13
4	ISSUED FOR TENDER	2022-10-24







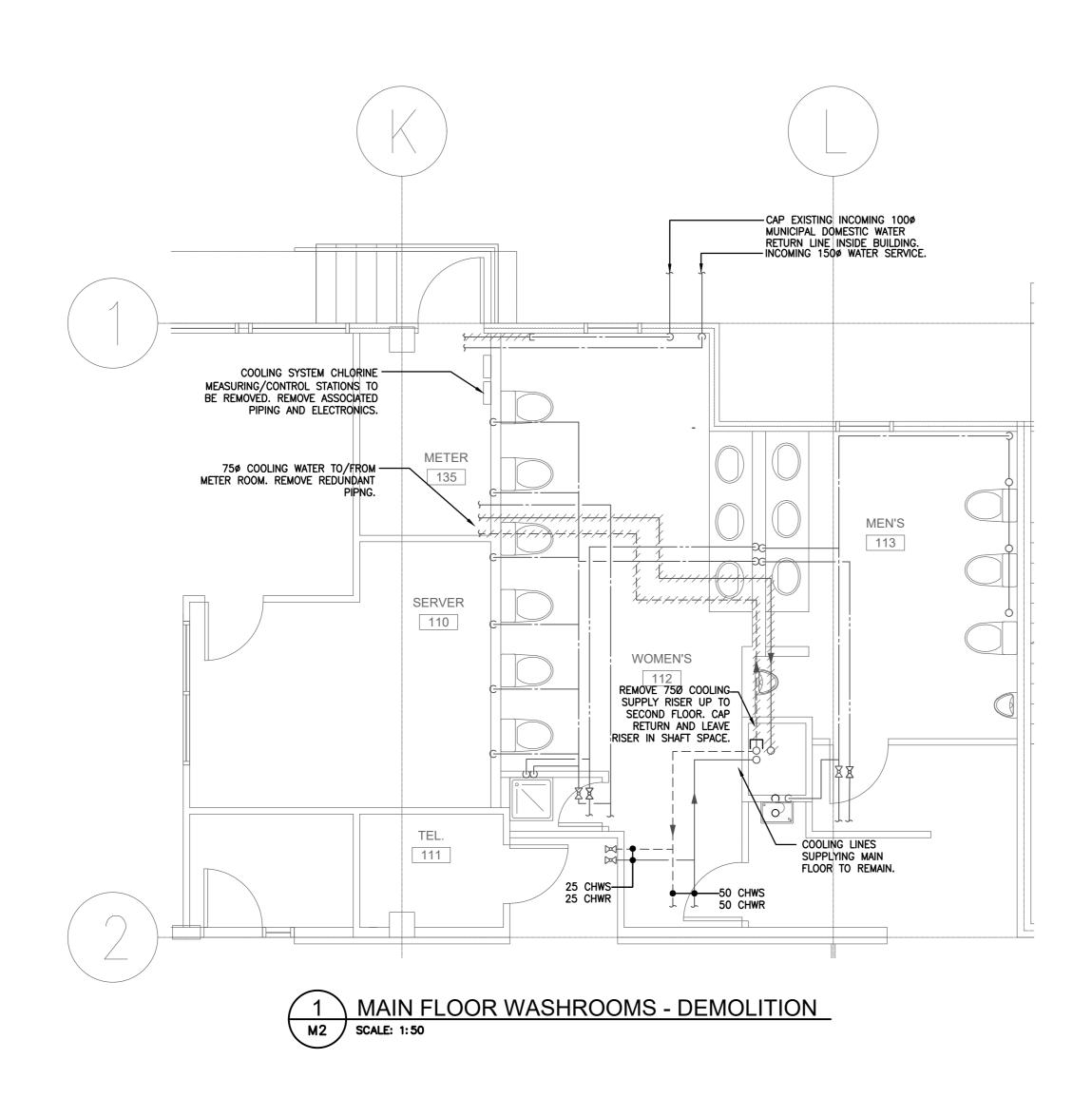
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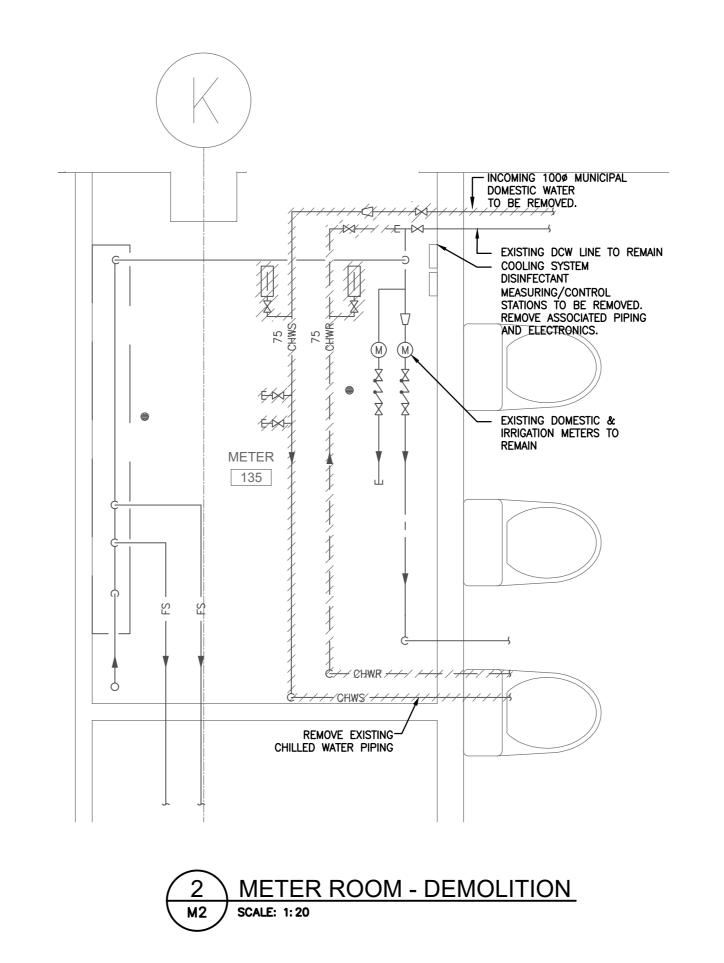
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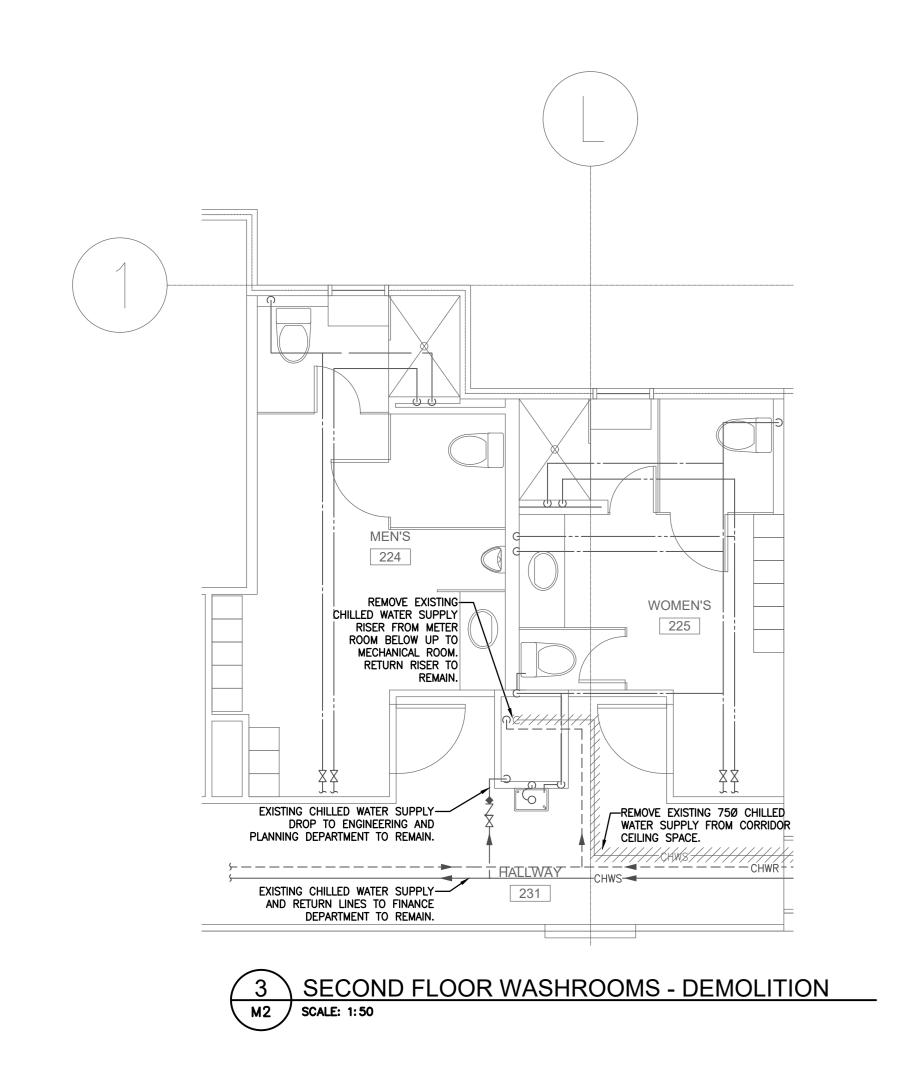
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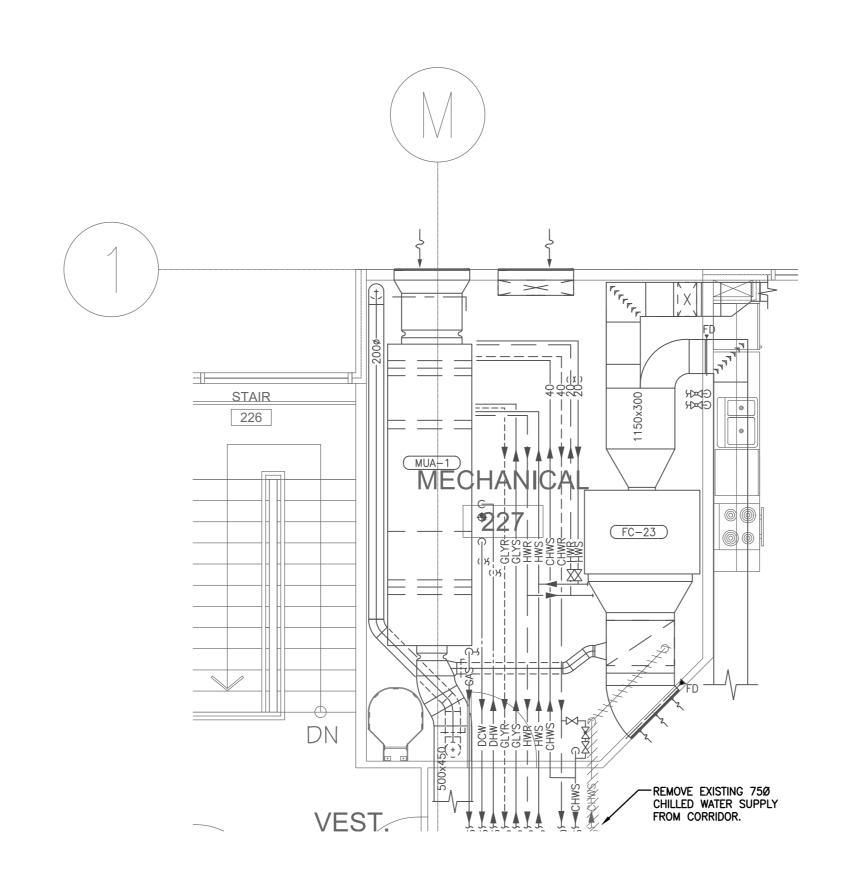
KEY PLAN

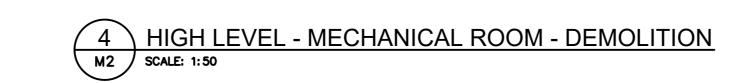
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Drawn By:	PS	Date:	2022-05-13

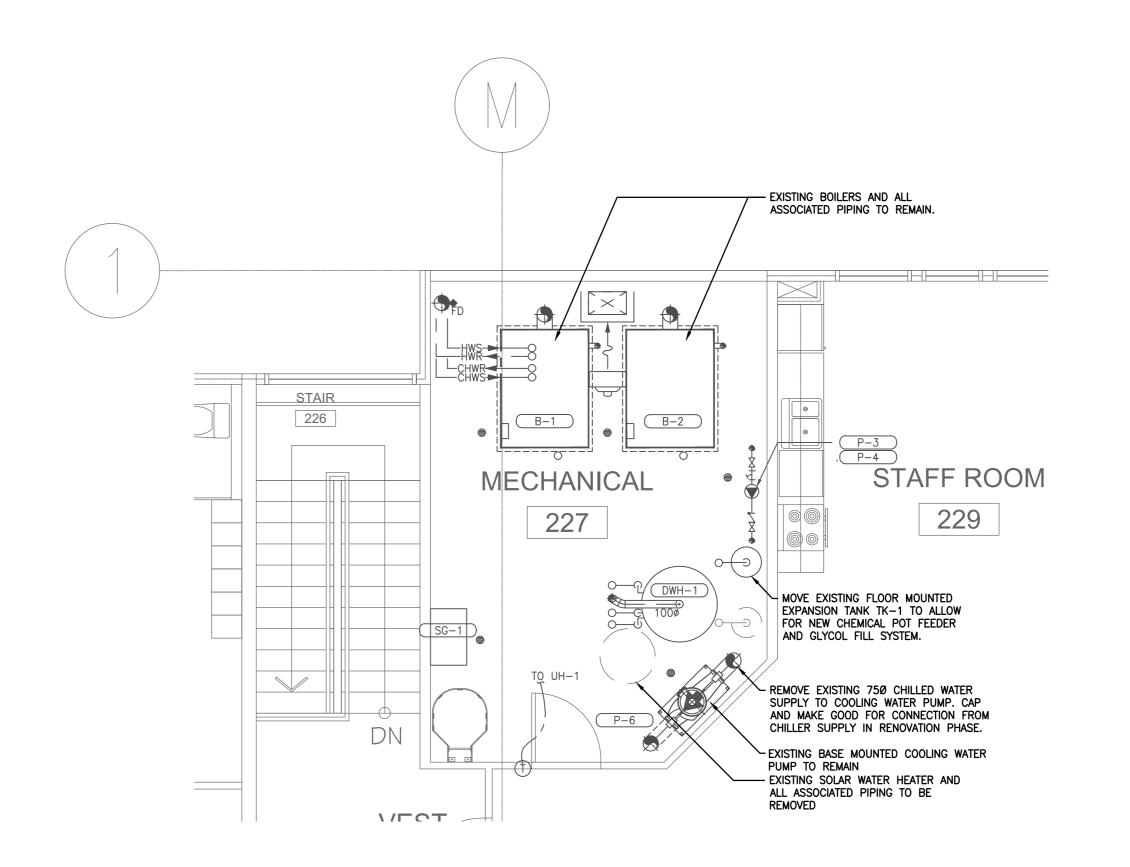












5 LOW LEVEL - MECHANICAL ROOM - DEMOLITION

SCALE: 1:50



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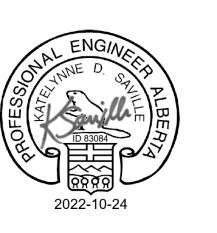
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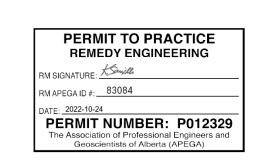
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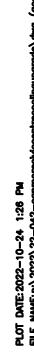


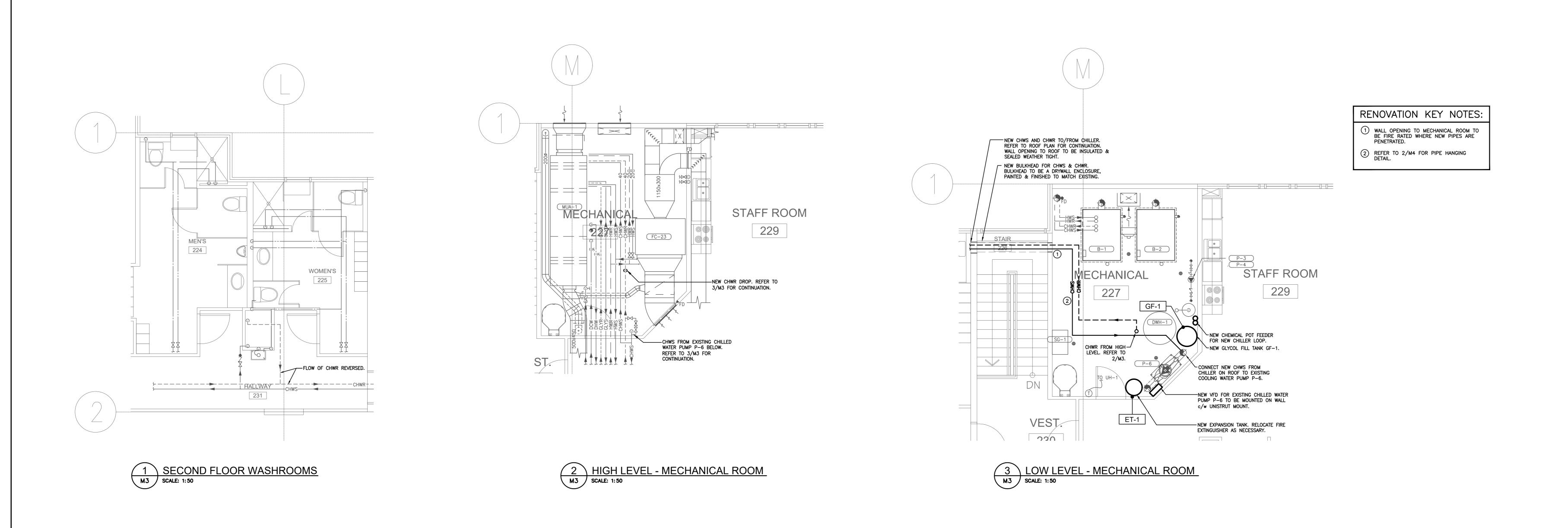


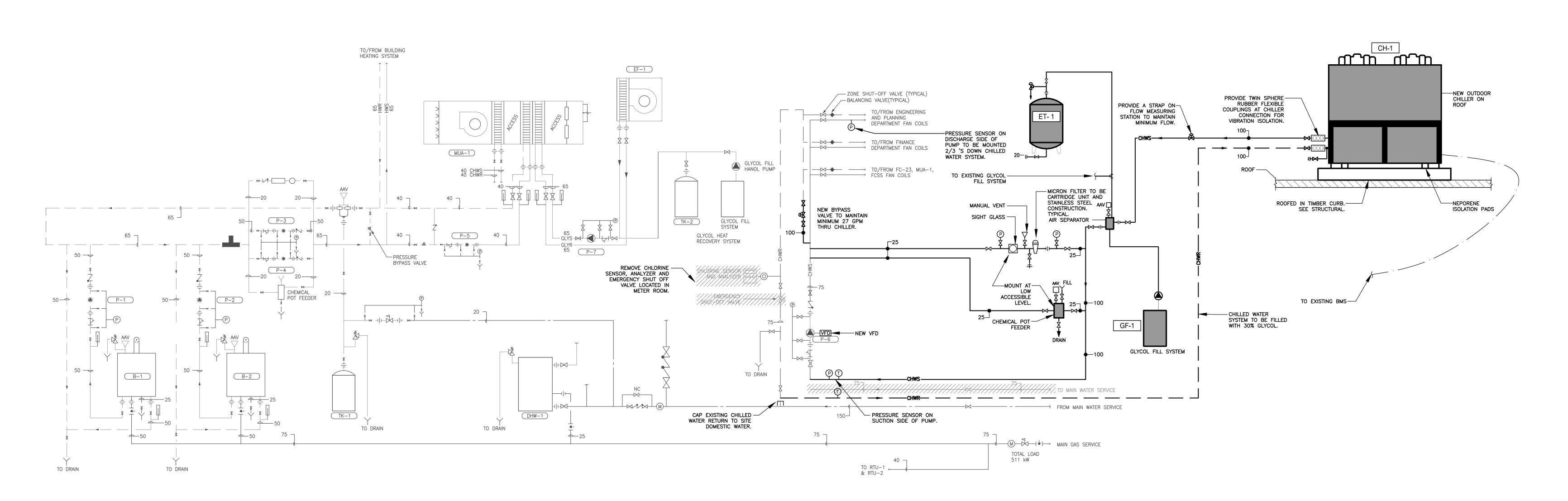
CANMORE CIVIC CENTRE COOLING UPGRADE

**MECHANICAL DEMOLITION PLAN** 

AS INDICATED Drawing Number







4 MECHANICAL HEATING AND COOLING SCHEMATIC
M3 SCALE: N.T.S.



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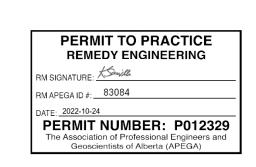
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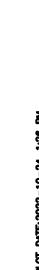


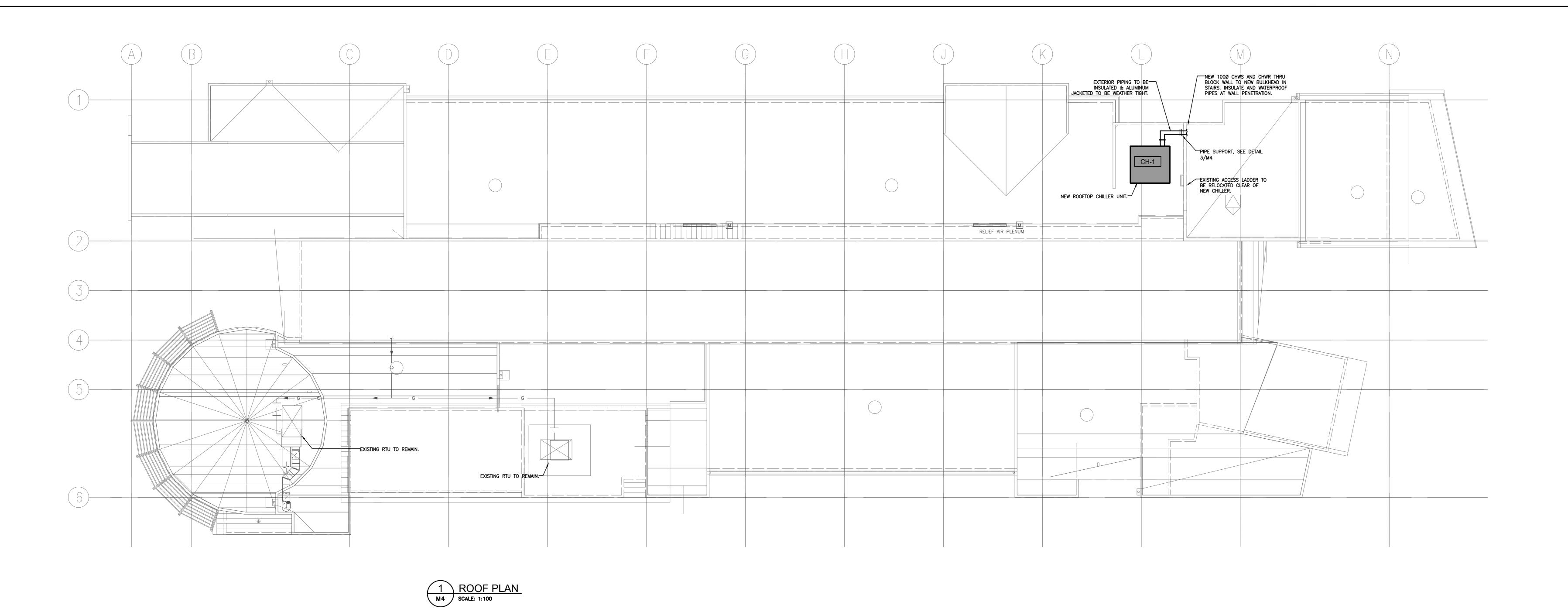
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**MECHANICAL RENOVATION PLAN &** 

**SCHEMATIC** 

Designed By AS INDICATED Drawing Number

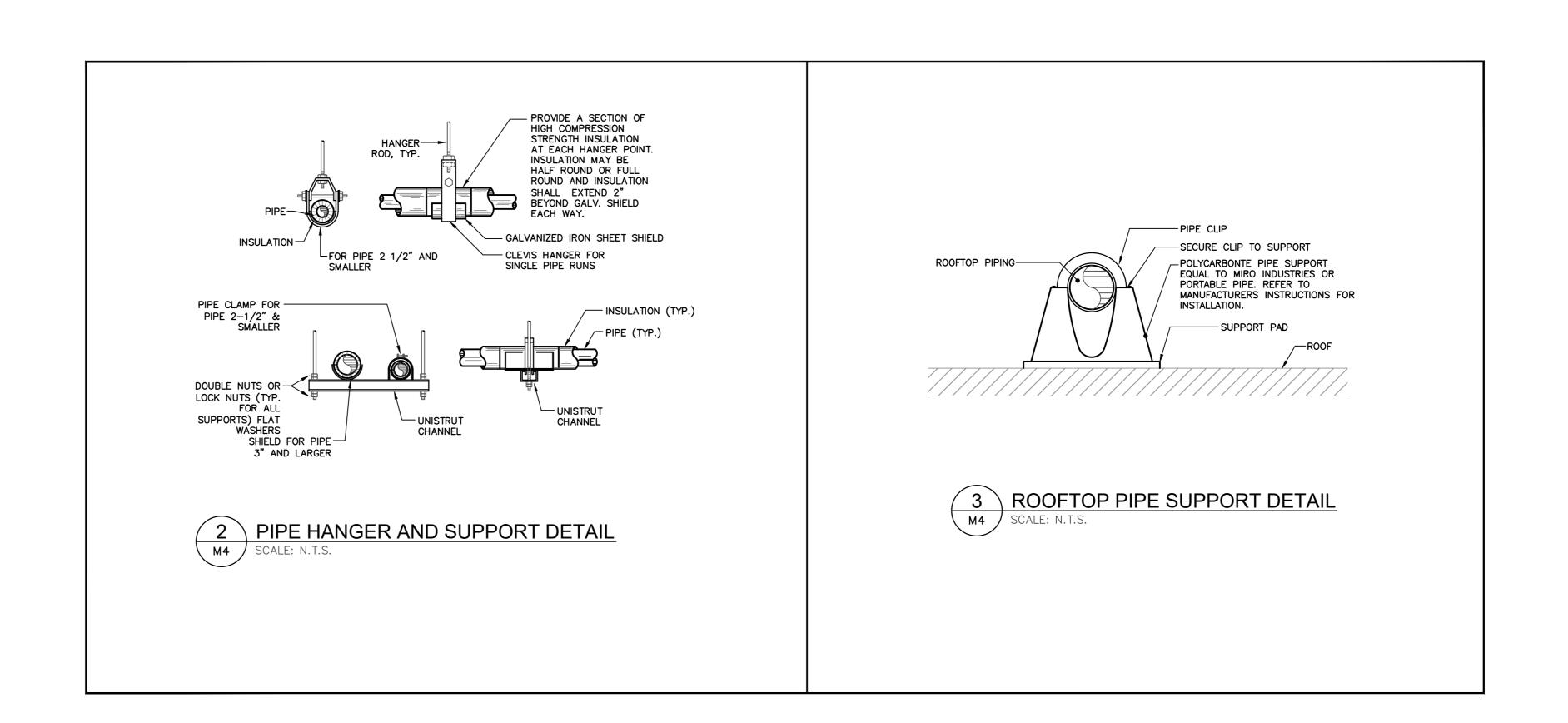




NO LOCATION/SERVICE

MANUFACTURER MODEL

GF-1 MECHANICAL ROOM / CHILLED AXIOM SF-100L 30% P.G. -



						CH	HILLER SCH	HEDU	LE								
NO	DESCRIPTION	MANUFACTURER	MODEL	COOLING CAPACITY	FLU ENTERING FLUID TEMP		FLOW PRESSURI	NO. OF FANS	TOTAL FAN MOTOR POWER	TOTAL COMPRESSOR POWER	TOTAL UNIT POWER	ELECTRICAL (V/PH/HZ)	AMBIENT AIR TEMP	FLUID TYPE	мса	WEIGHT	REMARKS
CH-1	ROOFTOP PACKAGED CHILLER	CARRIER	30RB070	209 KW	11.4 °C	5.5 °C	8.96 L/S 37.7 kP	a 4	8.77 kW	72.34 kW	81.12 kW	208-3-60	35°C	R-410A	334.7	1084 kG	AIR COOLED SCROLL CHILLER, MOUNTED ROOFED IN CURB COMPLETE WITH SPRING ISOLATION.

208 L 1245 610 22.6 230



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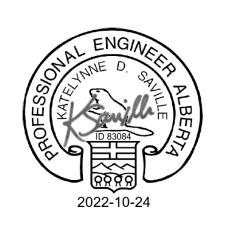
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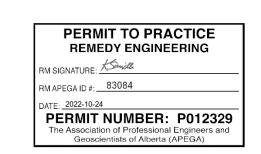
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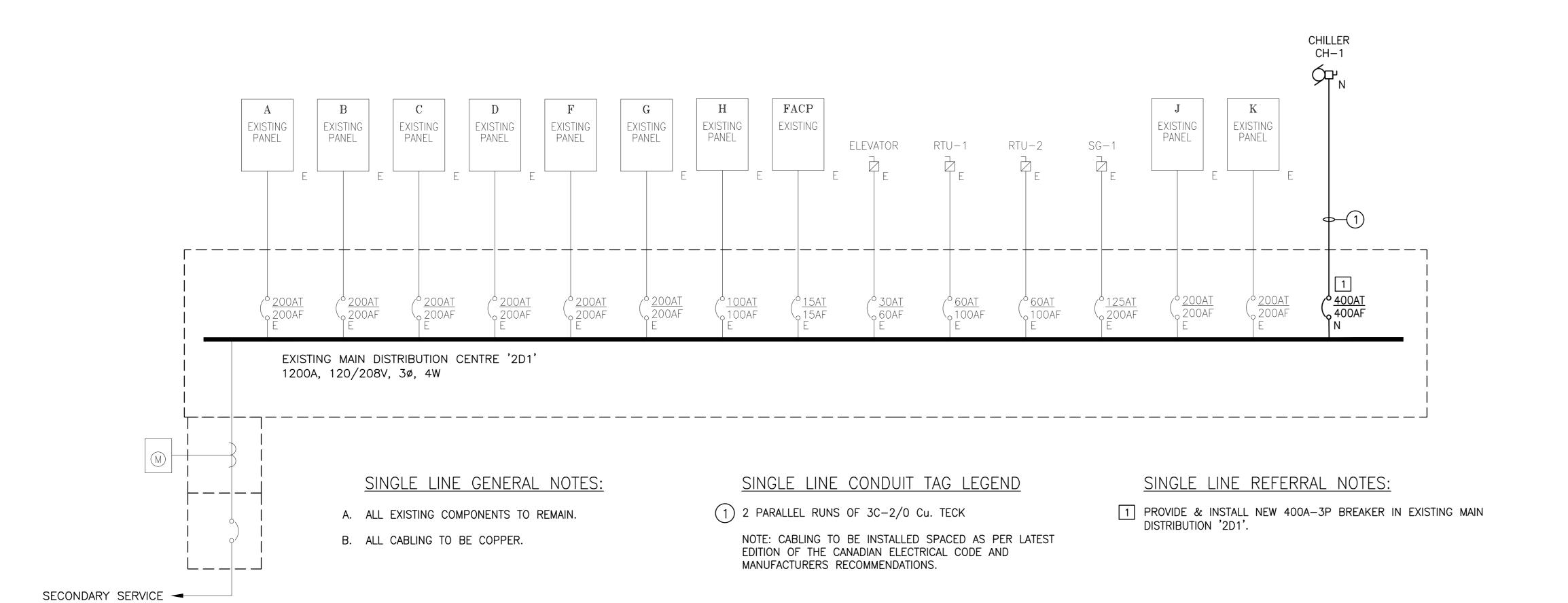


CANMORE CIVIC CENTRE COOLING UPGRADE

**MECHANICAL** ROOF PLAN, DETAILS & SCHEDULES

AS INDICATED Drawing Number

	ELECTRICAL DRAWING LIST
DWG. NO.	DWG. NAME
E0.0	ELECTRICAL COVER SHEET
E1.0	ELECTRICAL FLOOR PLANS
E2.0	ELECTRICAL SPECIFICATIONS



(1)	SINC	GLE	LINE	DIAGRAM
E0.0	SCALE:	N.T.S.		

۱.		MECHANICAL 227		120	/ 2	08 V		Bus Rating: ;	225 4		
LO	cation.	Existing Panel			Circ			bus Ruding.	223 F	`	
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5		EXISTING		15	С	$\vdash$	EXISTING			15	
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11		EXISTING		15	С	$\vdash$	EXISTING			15	1
13		EXISTING		15	A		EXISTING			15	1
15		EXISTING		15	В		EXISTING			15	1
17		EXISTING		15	С		EXISTING			40 /	1
19		EXISTING		15	Α					/ 2P	2
21		ROOFTOP MAINTENANCE REC. [1]		20	В		EXISTING			15	2
23		GLYCOL FILL GF-1 REC. [1]		15	С		EXISTING			15 /	2
25		SPACE			Α					/ 2P	2
27		SPACE			В					15 /	2
29		SPACE			С		EXISTING			1 /	3
31		SPACE			Α					/ 3P	3
33		SPACE			В		SPACE				3
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Printed on May 09, 2022 at 9:18 AM															
Unit No.	nit No. Description						urrent Prot	ection	Feeder	Fed From			F.A. Shut-	Domada.	
Unit No.	Description	(V)	Phase Ø	MCA (A)	(HP, FLA, kW)	Туре	Rating	Poles	Conductors	rea from	NEMA Rating		1 C	down	
CH-1	CHILLER	208	3	334.7 A		BKR	400 A	3P	2 x 3C2/0 TECK	2D1	3R	м	ΕΕ		PACKAGED UNIT.
GENERAL  a. IN MOS WITH THE OF DISTRI CONSIDER	& FEEDER ABBREVATIONS OAD AMPACITY MCA=MINIMUM CIRCUIT AMPACITY HE  NOTES  ST CASES THE FLA'S AND ASSOCIATED BRAI MECHANICAL CONTRACTOR PRIOR TO ORD BUTION SHOP DRAWINGS IS BASED ON THE ED FOR FAILURE TO CONFIRM THE FLA'S RICAL CONTRACTOR IS TO UPDATE ALL INFO	NCH CIRC ERING EC ASSUMF OF MOTO	CUITS A QUIPME PTION 1 ORS PR	ARE BASEL INT (BREA IHAT FLA'S	O ON THE CANA KERS, OVERLOA OF MOTORS I UBMISSION OF	adian el DS, etc Have be Distribl	E.), AND INSTEN CONFIRM	TALLATIO MED. NO PMENT S	ON OF BRANCH CIRCU ADDITIONAL COSTS WI HOP DRAWINGS.	ITS. APPROVAL LL BE					
AND MOTO	OR NAMEPLATE COLUMNS ARE TO BE FILLE INDICATED, PROVIDE ROOFTOP GFCI RECEF	O IN BY	THE C	ONTRACTO	R.										
	S NOTED OTHERWISE, ALL EQUIPMENT TEMP								RATURE). FOR EXISTING						

# LEGEND OF SYMBOLS POWER T—SLOT GROUND FAULT RECEPTACLE (5—20R) ☐ FLOOR MOUNTED JUNCTION/SLAB BOX ☐ ELECTRICAL PANELBOARD — SURFACE MOUNTED MECHANICAL MOTOR MOTOR MOTOR C/W DISCONNECT SWITCH ☐ UNFUSED DISCONNECT SWITCH ☐ UNFUSED DISCONNECT SWITCH ☐ COMBINATION MAG STARTER/DISCONNECT SWITCH MISEF4 MOTOR IDENTIFICATION TAG (REFER TO MECHANICAL) GENERAL

_	· · · · · · · · · · · · · · · · ·
(MISEF4)	MOTOR IDENTIFICATION TAG (REFER TO MECHANICAL SCHEDULE)
	GENERAL
	CONDUIT CONCEALED
0	CONDUIT - UP
0	CONDUIT - DOWN
WP	DENOTES WEATHERPROOF DEVICE
Е	DENOTES EXISTING DEVICE TO REMAIN
R	DENOTES EXISTING DEVICE TO REMOVE BACK TO SOURCE
RR	DENOTES REMOVE AND REPLACE WITH NEW
ER	DENOTES EXISTING DEVICE TO BE RELOCATED
RL	DENOTES RELOCATED DEVICE
Ν	DENOTES NEW DEVICE
	SINGLE LINE
<b></b>	CIRCUIT BREAKER
22kA IC	FAULT CURRENT VALUE
M	METER
$\sim$	CURRENT TRANSFORMER
M	METER CABINET
2PA 120/208V 225A 42CCT	PANEL

FUSED DISCONNECT SWITCH



NOTES

VERIFY ALL DIMENSIONS, ELEVATIONS, AND DATUM; REPORT ANY ERRORS AND/OR DISCREPANCIES TO THE ENGINEER PRIOR TO CONSTRUCTION.

ALL DRAWINGS REMAIN PROPERTY OF THE ENGINEER.

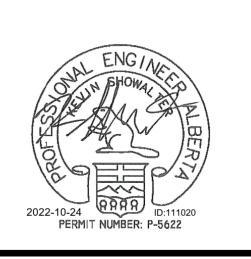
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DO NOT SCALE DRAWINGS.

THIS DRAWING SUPERCEDES PREVIOUS ISSUES.

No.	Description	Date
1	ISSUED FOR 80% REVIEW	2022-04-
2	ISSUED FOR FINAL REVIEW	2022-05-
3	ISSUED FOR TENDER	2022-10-





PERMIT TO PRACTICE
SMP ENGINEERING

RM SIGNATURE:

111020

DATE: 2022-10-24

PERMIT NUMBER: P005622

The Association of Professional Engineers and Geoscientists of Alberta (APEGA)

CANMORE CIVIC CENTRE COOLING UPGRADE

Drawing Title:

ELECTRICAL

COVER SHEET

Drawn By:

VA

Date:

2022-10-24

Designed By:

BP

Scale:

AS SHOWN

Engineer:

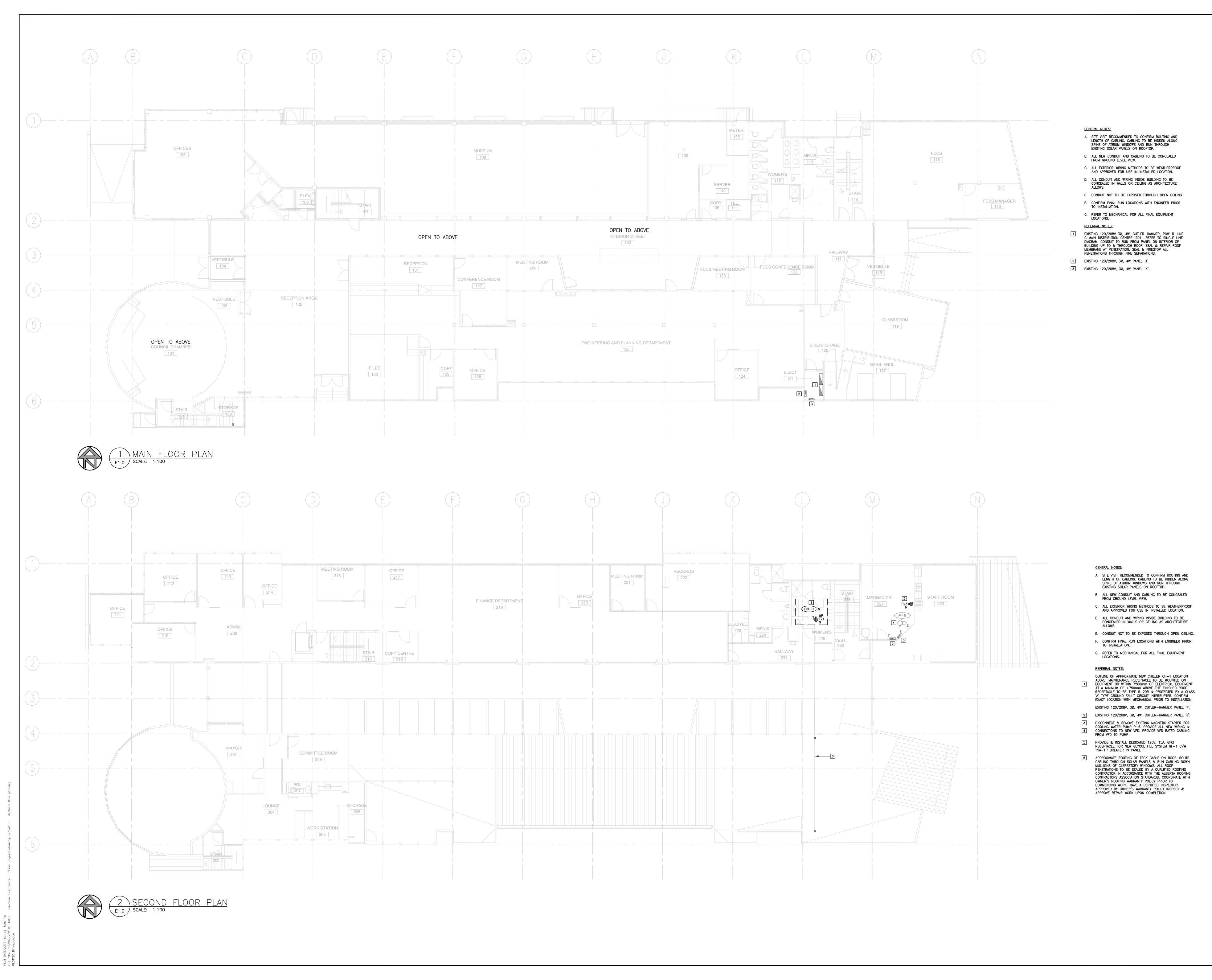
KS

Job number:

22-01-0095

Rev. No.

PLOT DATE:2022—10—24 3:26 PM FILE NAME:m:\2022\22—01—0095 — canmore civic centre — chiller upgrade\drawings\wd\e0.0 — electrical





NOTES

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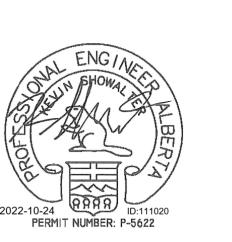
DO NOT SCALE DRAWINGS.

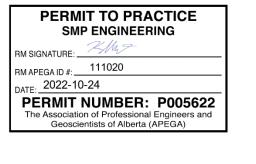
THIS DRAWING SUPERCEDES PREVIOUS ISSUES.

Revisions

No.	Description	Date
1	ISSUED FOR 80% REVIEW	2022-04-26
2	ISSUED FOR FINAL REVIEW	2022-05-13
3	ISSUED FOR TENDER	2022-10-24







CANMORE CIVIC CENTRE COOLING UPGRADE

Drawing Title:

ELECTRICAL
FLOOR PLANS

Drawn By:	VA	Date:	2022-10-24
Designed By:	BP	Scale:	AS SHOWN
Engineer:	KS	Job number:	22-01-0095

# 1.0 GENERAL

- 1.1 THE GENERAL REQUIREMENTS. INSTRUCTIONS TO BIDDERS. THIS SPECIFICATION AND ANY ADDENDA HERETO FORM PART OF THE CONTRACT DOCUMENTS AND SHALL BE READ IN CONJUNCTION WITH THEM. WORK SHALL INCLUDE THE FURNISHING OF ALL LABOUR AND MATERIALS UNLESS. SPECIFICALLY NOTED OTHERWISE TO COMPLETE AND PUT INTO OPERATING CONDITION ALL ELECTRICAL SYSTEMS AS INDICATED ON THE DRAWINGS AND SPECIFIED HEREIN.
- 1.2 THE SCOPE OF WORK IS AS DESCRIBED HEREIN AND SHOWN ON THE DRAWINGS.

# 2.0 STANDARD OF MATERIAL AND WORKMANSHIP

- 2.1 ALL MATERIALS SHALL BE NEW AND OF THE QUALITY SPECIFIED AND SHALL CONFORM TO THE STANDARDS OF THE CANADIAN STANDARDS ASSOCIATION. WHERE EQUIPMENT OR MATERIALS ARE SPECIFIED BY TECHNICAL DESCRIPTION ONLY. THEY SHALL BE OF THE BEST COMMERCIAL QUALITY OBTAINABLE FOR THE PURPOSE.
- 2.2 QUALIFIED TRADESMEN SHALL EXECUTE ALL WORK IN A NEAT AND WORKMANLIKE MANNER. ELECTRICAL TRADE SHALL KEEP A COMPETENT FOREMAN AND NECESSARY ASSISTANTS ALL SATISFACTORY TO THE ENGINEER ON THE JOB DURING THE PROGRESS OF THE WORK.

# 3.0 FIRE PROTECTION AND SMOKE SEALING

- 3.1 WHERE CABLES, CONDUITS, BUS DUCTS OR SIMILAR ELECTRICAL EQUIPMENT PASS THROUGH FIRE RATED ASSEMBLIES SUCH AS FLOORS WALLS AND CEILINGS, THE FIRE RATING OF THESE ASSEMBLIES SHALL BE MAINTAINED BY USING ENGINEER APPROVED AND ULC LISTED FIRESTOP MATERIALS. PROVIDE MANUFACTURER LITERATURE SHOWING THAT THE PROPOSED FIRESTOP SYSTEM IS A ULC LISTED SYSTEM FOR THE PROPOSED APPLICATION.
- 3.2 WHERE CABLES, CONDUITS, BUS DUCTS OR SIMILAR ELECTRICAL EQUIPMENT PASS THROUGH SMOKE RATED ASSEMBLIES SUCH AS FLOORS. WALLS AND CEILINGS, THE SMOKE RATING OF THESE ASSEMBLIES SHALL BE MAINTAINED BY USING ENGINEER APPROVED AND ULC LISTED MATERIALS. PROVIDE MANUFACTURER LITERATURE SHOWING THAT THE PROPOSED SYSTEM IS A ULC LISTED SYSTEM FOR THE PROPOSED APPLICATION.
- 3.3 THE SYSTEMS USED TO COMPLY WITH THE SMOKE SEALING AND FIRE PROTECTION REQUIREMENTS SHALL BE INSTALLED AS PER THE MANUFACTURER RECOMMENDATIONS. THE MANUFACTURER REPRESENTATIVE SHALL WITNESS AND CONFIRM THAT THE SYSTEM HAS BEEN INSTALLED IN COMPLIANCE WITH MANUFACTURER RECOMMENDATIONS AND THE ULC LISTING FOR THE SPECIFIC INSTALLATION.
- 3.4 THIS CONTRACTOR SHALL PROVIDE TWO LETTERS TO THE ENGINEER AT THE COMPLETION OF THE JOB AS FOLLOWS:
- .1 A LETTER ON THE COMPANY OFFICIAL LETTERHEAD SIGNED BY AN OFFICIAL OF THE CONTRACTING COMPANY WITH SIGNING AUTHORITY STATING THAT THE SYSTEMS HAVE BEEN INSTALLED AS PER THE MANUFACTURER RECOMMENDATIONS.
- .2 A LETTER ON THE COMPANY OFFICIAL LETTERHEAD SIGNED BY AN OFFICIAL OF THE MANUFACTURER REPRESENTATIVE COMPANY WITH SIGNING AUTHORITY STATING THEY HAVE INSPECTED THE SYSTEMS AND THAT THE SYSTEMS HAVE BEEN INSTALLED AS PER MANUFACTURER RECOMMENDATIONS AND THE ULC LISTING FOR THE SPECIFIC INSTALLATIONS.
- 3.5 THIS CONTRACTOR SHALL ALLOW FOR ALL COSTS RELATING TO THE INSTALLATION OF SEALING AND FIRE PROTECTION MATERIALS FOR ELECTRICAL INSTALLATIONS, WITNESSING BY THE MANUFACTURER REPRESENTATIVES AND PREPARATION OF THE LETTERS.

# 4.0 FLAME RATING OF CABLES

4.1 CABLES NOT INSTALLED IN ENCLOSED CONDUIT SHALL BE MINIMUM FT6 RATED. TYPICAL EXAMPLES ARE: CABLES IN CABLE TRAY, TECK CABLES AND CABLES USED FOR GROUNDING CABLE TRAYS.

# 5.0 UNIFORMITY OF EQUIPMENT

- 5.1 UNLESS OTHERWISE SPECIFICALLY CALLED FOR IN THE SPECIFICATIONS, UNIFORMITY OF MANUFACTURE SHALL BE MAINTAINED FOR ANY PARTICULAR ITEM THROUGHOUT THE BUILDING.
- 6.0 DRAWINGS AND SPECIFICATIONS
- 6.1 THE DRAWINGS AND SPECIFICATIONS ARE COMPLEMENTARY EACH TO THE OTHER AND WHAT IS CALLED FOR BY ONE SHALL BE BINDING AS IF CALLED FOR BY BOTH.
- 6.2 SHOULD ANY DISCREPANCY APPEAR BETWEEN THE DRAWINGS AND SPECIFICATIONS WHICH LEAVES THE ELECTRICAL TRADE IN DOUBT AS TO THE TRUE INTENT AND MEANING OF THE PLANS AND SPECIFICATIONS, A RULING SHALL BE OBTAINED FROM THE ENGINEER. IF THIS IS NOT DONE. IT WILL BE ASSUMED THAT THE MOST EXPENSIVE ALTERNATE HAS BEEN FIGURED.
- 7.0 CODES, PERMITS AND INSPECTION
- 7.1 THE INSTALLATION SHALL COMPLY WITH THE REQUIREMENTS OF THE CURRENT EDITION OF THE CANADIAN ELECTRICAL CODE AND THE REGULATIONS OF THE AUTHORITY HAVING JURISDICTION
- 7.2 THE ELECTRICAL TRADE SHALL OBTAIN ALL PERMITS REQUIRED AND DISPLAY THEM IN THE FLECTRICAL ROOM.

# 8.0 EXAMINATION OF THE SITE

8.1 PRIOR TO SUBMITTING THEIR TENDER. THE ELECTRICAL TRADE SHALL CAREFULLY EXAMINE THE SITE AND ASCERTAIN ALL CONDITIONS WHICH SHALL AFFECT THEIR TRADE. NO EXTRAS WILL BE ALLOWED FOR WORK RESULTING FROM CONDITIONS THAT WOULD HAVE BEEN EVIDENT UPON A THOROUGH EXAMINATION OF THE SITE.

# 9.0 CLEAN UP

- 9.1 THE ELECTRICAL TRADE AND THEIR SUBTRADES SHALL AT ALL TIMES DURING CONSTRUCTION. KEEP THE SITE FREE OF ALL DEBRIS, BOXES, PACKING ETC., RESULTING FROM WORK OF THIS TRADE.
- 9.2 AT THE COMPLETION OF THE WORK, THE ELECTRICAL INSTALLATION SHALL BE LEFT IN A CLEAN FINISHED CONDITION TO THE SATISFACTION OF THE ENGINEER.

9.3 ALL LUMINAIRES AND ELECTRICAL DEVICES IN THE RENOVATED AREAS SHALL BE WASHED, CLEANED OF GREASE, DIRT AND LINT AS REQUIRED.

#### 10.0 SETTING OUT OF THE WORK

- 10.1 THE ELECTRICAL TRADE SHALL BE RESPONSIBLE FOR CORRECTING ALI WORK COMPLETED CONTRARY TO THE INTENT OF THE DRAWINGS AND SPECIFICATIONS AND SHALL BEAR ALL COST FOR SAME. WHERE THE INTENT OF THE DRAWINGS AND SPECIFICATIONS IS NOT CLEAR, THEY SHALL OBTAIN THE CLARIFICATION OF THE ENGINEER BEFORE PROCEEDING WITH THE WORK.
- 10.2 THE ELECTRICAL TRADE SHALL GIVE THE WORK THEIR PERSONAL SUPERVISION, LAY OUT THEIR OWN WORK, DO ALL NECESSARY LEVELING AND MEASURING OR EMPLOY A COMPETENT ENGINEER TO DO SO FIGURES, FULL SIZE AND DETAIL DRAWINGS SHALL TAKE PRECEDENCE OVER SCALE MEASUREMENTS.
- 10.3 WHERE ANY EQUIPMENT SUPPLIED BY THE ELECTRICAL TRADE MUST BE BUILT IN WITH THE WORK OF OTHER CONTRACTORS. THIS CONTRACTOR SHALL BE RESPONSIBLE FOR THE SUPPLYING OF THE EQUIPMENT TO BE BUILT IN OR MEASUREMENTS TO ALLOW NECESSARY OPENINGS TO BE LEFT SO AS NOT TO HOLD UP THE WORK.
- 10.4 ELECTRICAL TRADE SHALL BE RESPONSIBLE FOR ANY DAMAGE CAUSED TO THE OWNER OR ANY OF THE OTHER TRADES BY IMPROPER LOCATION OF CARRYING OUT OF THEIR WORK.

# 11.0 LOCATION OF OUTLETS

11.1 ENGINEER RESERVES THE RIGHT TO CHANGE LOCATION OF OUTLETS TO WITHIN 3048mm (10') OF POINTS INDICATED ON PLANS WITHOUT EXTRA CHARGE PROVIDING ELECTRICAL TRADE IS ADVISED PRIOR TO INSTALLATION.

# 12.0 ACCESS DOORS

- 12.1 NUMBER OF ACCESS DOORS TO BE KEPT TO AN ABSOLUTE MINIMUM AND TO BE USED ONLY WITH THE PERMISSION OF THE ENGINEER.
- 12.2 WHERE ACCESS IS REQUIRED TO PULLBOXES AND JUNCTION BOXES, THESE BOXES TO BE LOCATED IN REMOVABLE TYPE CEILING AREAS WHERE POSSIBLE OR ADJACENT TO RECESSED LUMINAIRES.
- 12.3 WHERE IT IS ABSOLUTELY IMPOSSIBLE TO SERVICE CERTAIN EQUIPMENT THROUGH REMOVABLE TYPE CEILINGS OR RECESSED LUMINAIRES AND WHERE SPECIAL PERMISSION HAS BEEN OBTAINED FROM THE ENGINEER, DIVISION 26 TO SUPPLY AND INSTALL ACCESS DOORS REQUIRED FOR SERVICING OF SUCH WORK. ACCESS DOORS TO BE COMPLETE WITH NECESSARY FRAMES AND HINGED DOORS HELD CLOSED WITH CAPTIVE TYPE STUDS. ACCESS PANELS TO BE OF NOT LESS THAN 14 GAUGE STEEL. PRIME COATED AND PAINTED ON THE JOB TO MATCH THE WALL OR CFILING FINISH.

# 13.0 PAINTING AND FINISHES

- 13.1 ALL ELECTRICAL FITTINGS, SUPPORTS, HANGER RODS, PULL BOXES, CHANNEL FRAMES, CONDUIT RACKS, OUTLET BOXES, BRACKETS, CLAMPS, ETC., SHALL HAVE GALVANIZED FINISH OR PAINT FINISH OVER CORROSION-RESISTANT PRIMER.
- 13.2 ALL PANELBOARDS SHALL BE FACTORY FINISHED WITH SPRAY-ON AIR DRY ENAMEL. ALL ENAMEL SHALL BE APPLIED OVER CORROSION-RESISTANT PRIMER. MATTE OR FLAT TYPE FINISH PAINT WILL NOT BE ACCEPTED. ALL PANELS OR SIMILAR FACTORY-FINISHED UNITS THAT ARE SCRATCHED OR MARKED DURING INSTALLATIONS SHALL BE TOUCHED UP WITH MATCHING SPRAY-ON DRY LACQUER AND IF REQUIRED TO PROVIDE SATISFACTORY JOB SHALL BE COMPLETELY REFINISHED.

# 14.0 SHOP DRAWINGS

- 14.1 ELECTRICAL TRADE SHALL SUBMIT TO THE ENGINEER FOR APPROVAL, SHOP DRAWINGS OF ELECTRICAL COMPONENTS INCLUDING:
- .1 BREAKERS. & STARTERS
- .2 ELECTRICAL DEVICES
- 14.2 ALL DRAWINGS SHALL BE SUBMITTED TO THE ENGINEER IN PDF FORM VIA EMAIL. EACH ITEM TO BE A SEPARATE PDF FILE, SUITABLE LABELED AND REVIEWED BY THE CONTRACTOR AFTER REVIEW AND APPROVAL THEY WILL BF EMAILED BACK TO THE SENDER.
- 14.3 THE ENGINEER'S APPROVAL OF SHOP DRAWINGS SHALL BE FOR GENERAL DESIGN ONLY AND SHALL NOT RELIEVE THE ELECTRICAL TRADE OR SUPPLIERS FROM THEIR RESPONSIBILITY FOR ERRORS, PROPER FITTING, CONSTRUCTION OF THE WORK AND FURNISHING OF MATERIALS. THE APPROVAL SHALL NOT BE CONSTRUED AS APPROVING DEPARTURES FROM THE CONTRACT DOCUMENT REQUIREMENTS IF SUCH DEPARTURES ARE NOT SPECIFICALLY NOTED IN A COVERING LETTER ACCOMPANYING SUCH DRAWINGS. ELECTRICAL TRADE SHALL BE RESPONSIBLE FOR VERIFYING ALL DIMENSIONS.

# 15.0 ASBUILT PLANS

- 15.1 THE ENGINEER WILL FURNISH TO THE ELECTRICAL TRADE ONE SET OF WHITE PRINTS TO BE USED FOR ASBUILT WORK AS ACTUALLY INSTALLED. ELECTRICAL TRADE SHALL ACCURATELY RECORD ON THIS SET OF PLANS. DAY BY DAY, ALL OUTLETS, CONDUIT, LUMINAIRES, EQUIPMENT AS ACTUALLY INSTALLED ON THE JOB. ANY CHANGES TO THE CONTRACT WORK SHALL BE SIMILARLY RECORDED.
- 15.2 ASBUILT DRAWINGS SHALL BE CLEARLY MARKED IN RED INCLUDING ALL CHANGES TO THE ORIGINAL TENDER DRAWINGS COVERED BY ADDENDA. CHANGE ORDERS, FIELD CHANGES, JOB CONDITIONS, ETC.
- 15.3 FINAL PAYMENT TO THE CONTRACTOR WILL NOT BE RELEASED UNTIL ASBUILT DRAWINGS ARE RECEIVED BY THE ENGINEER. ASBUILT DRAWINGS ARE TO BE TURNED OVER TO THE ENGINEER AT TIME OF FINAL INSPECTION.
- 15.4 CONTRACTOR TO CARRY A \$300.00 CASH ALLOWANCE FOR ASBUILT DRAWINGS.

# 16.0 TESTS

- 16.1 ALL PORTIONS OF THE ELECTRICAL WORK SHALL BE TESTED AND CHECKED FOR SATISFACTORY OPERATION.
- 16.2 BEFORE ENERGIZING ANY PORTION OF THE ELECTRICAL SYSTEM. PERFORM MEGGER TESTS ON NEW FEEDERS. RESULTS OF SUCH TESTS SHALL CONFORM TO THE REQUIREMENTS OF THE CANADIAN ELECTRICAL CODE AND SHALL BE TO THE SATISFACTION OF THE AUTHORIZED INSPECTION AGENCY AND THE ENGINEER.

16.3 UPON COMPLETION OF THE WORK AND IMMEDIATELY PRIOR TO FINAL INSPECTION AND TAKEOVER. CHECK THE LOAD BALANCE ON ALL FEEDERS AND AT DISTRIBUTION CENTRE, PANELS, ETC. THE TESTS SHALL BE CARRIED OUT BY TURNING ON ALL POSSIBLE LOADS IN THE SPACE AND CHECKING LOAD CURRENT BALANCE. IF LOAD UNBALANCE EXCEEDS 15 PER CENT, RECONNECT CIRCUITS TO BALANCE THE LOAD.

# 17.0 GUARANTEE/WARRANTY

- 17.1 FURNISH A WRITTEN GUARANTEE/WARRANTY COUNTERSIGNED AND GUARANTEED BY GENERAL CONTRACT TRADE STATING:
- .1 THAT ALL WORK EXECUTED UNDER THIS CONTRACT WILL BE FREE FROM DEFECTS OF MATERIAL AND WORKMANSHIP FOR A PERIOD OF ONE (1) YEAR FROM THE DATE OF FINAL ACCEPTANCE OF THIS WORK.
- .2 THE ABOVE PARTIES FURTHER AGREE TO, AT THEIR OWN EXPENSE, REPAIR AND REPLACE ALL SUCH DEFECTIVE WORK AND OTHER WORK DAMAGED THEREBY WHICH FAILS OR BECOMES DEFECTIVE DURING THE TERM OF THE GUARANTEE/WARRANTY PROVIDED THAT SUCH FAILURE IS NOT DUE TO IMPROPER USAGE.
- .3 THE PERIOD OF THE GUARANTEE/WARRANTY SPECIFIED SHALL IN NO WAY SUPPLANT ANY OTHER GUARANTEE OF A LONGER PERIOD BUT SHALL BE BINDING ON WORK NOT OTHERWISE COVERED.

# 18.0 BUILDING WIRING

- 18.1 ALL WIRING SHALL BE COPPER WITH RW90 X-LINK INSULATION IN RIGID GALVANIZED STEEL CONDUIT OR ELECTRICAL METALLIC TUBING UNLESS INDICATED OTHERWISE ON DRAWINGS. NO WIRE SMALLER THAN NO. 12 AWG SHALL BE USED FOR BRANCH CIRCUIT WIRING
- 18.2 CONDUIT TO BE SIZED IN ACCORDANCE WITH THE CANADIAN ELECTRICAL CODE.

# 19.0 WIRING DEVICES

- 19.1 BOXES, EXCEPT WHERE OTHERWISE NOTED, SHALL BE PRESSED SHEET STEEL GALVANIZED TO CSA STANDARDS. ALL OUTLETS FOR FLUSH WALL MOUNTING SWITCHES. RECEPTACLES. TELEPHONE AND LV OUTLETS SHALL BE NO. 52151 BOX WITH APPROPRIATE PLASTER COVER FOR SINGLE 2-GANG OUTLETS OR 4-GANG OUTLETS. FLUSH MOUNTING VOICE AND/OR DATA WALL OUTLETS SHALL BE NO. 52171 SERIES (4" SQUARE, 2%" DEEP WITH APPROPRIATE PLASTER OR EXTENSION RING).
- 19.2 SECTIONAL TYPE BOXES OR HANDY BOXES SHALL NOT BE USED.
- 19.3 RECEPTACLES TO BE OF SPECIFICATION GRADE AND OF ONE MANUFACTURER TO MATCH EXISTING.
- 19.4 AT THE COMPLETION OF THE PROJECT:
- .1 THE CONTRACTOR SHALL TURN OVER EQUIPMENT BEING REMOVED TO BUILDING MANAGEMENT. EQUIPMENT NOT REQUIRED BY BUILDING MANAGEMENT SHALL BE REMOVED FROM SITE BY THE CONTRACTOR.
- .2 THE CONTRACTOR SHALL SEAL ALL UNUSED OPENINGS DUE TO ELECTRICAL DEMOLITION TO ENSURE THAT FIRE-RESISTANCE RATING IS MAINTAINED.
- .3 THE CONTRACTOR SHALL REMOVE, REINSTALL AND RECONNECT ALL ELECTRICAL DEVICES AFFECTED BY NEW CEILING OR WALL FINISHES.
- 19.5 ALL DEVICES TO MATCH EXISTING COLOUR.

# 20.0 SUPPORTING DEVICES

- 20.1 CONDUIT SUPPORTS: SINGLE RUNS TO BE GALVANIZED CONDUIT STRAPS OR RING BOLT RANGE 1 TYPE HANGERS; MULTIPLE RUNS (THREE OR MORE) - CONDUIT RACK: VERTICAL RUNS - CHANNEL SUPPORT WITH CONDUIT FITTINGS. CONDUIT SUPPORTS SHALL BE PVC FOR PVC CONDUIT.
- 20.2 INSTALL TO MAINTAIN HEADROOM, NEAT MECHANICAL APPEARANCE AND TO SUPPORT EQUIPMENT LOADS REQUIRED. WHERE INSERTS ARE REQUIRED IN CONCRETE, EXPANSION INSERTS, LEAD INSERTS OR PLASTIC INSERTS MAY BE USED IN DRILLED HOLES. WOOD OR FIBRE PLUGS NOT PERMITTED.
- 20.3 ALL ELECTRICAL DISTRIBUTION INCLUDING CABLE TRAY AND CONDUIT THAT IS MOUNTED ABOVE THE SUSPENDED CEILING SHALL BE SUPPORTED DIRECTLY AND INDEPENDENTLY FROM THE STRUCTURE.
- 20.4 THE USE OF ANY PART OF THE CEILING OR CEILING SUSPENSION SYSTEM AS A SUPPORT OR FOUNDATION FOR THE SUSPENSION OF CABLE TRAY, CONDUIT OR FLEXIBLE CONDUIT (WHERE PERMITTED) IS FORBIDDEN.
- 20.5 THE USE OF ANY DRYWALL OR WALL PARTITION AS A SUPPORT OR FOUNDATION FOR CABLE TRAY OR CONDUIT ROUTED HORIZONTALLY THROUGH THE CEILING SPACE IS FORBIDDEN.
- 20.6 SUPPORT HANGERS AND TRAYS INSTALLED BY THE ELECTRICAL TRADE SHALL NOT BE USED BY OTHER TRADES TO SUPPORT NON-ELECTRICAL SERVICES OR DEVICES.

# 21.0 MOTOR STARTERS

21.1 MINIMUM EEMAC SIZE 1, THREE PHASE STARTERS: MAGNETIC AS SHOWN, C/W CONTROL TRANSFORMER AND AUXILIARY CONTACTS AS REQUIRED, HOA SELECTOR, RED RUNNING LIGHT, GREEN OFF LIGHT. MANUAL RESET TYPE THERMAL OVERLOAD RELAY AND RESET

# 22.0 BRANCH CIRCUIT PANELS

22.1 BRANCH CIRCUIT BREAKERS: BOLTED FULL SIZE BREAKERS TO MATCH EXISTING INTERRUPTING CAPACITY. UPDATE TYPEWRITTEN DIRECTORY INSIDE DOOR TO INCLUDE NEW CIRCUITS IN EXISTING PANELS.



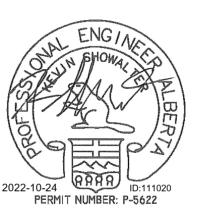
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No.	Description	Date
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2	ISSUED FOR FINAL REVIEW	2022-05-
3	ISSUED FOR TENDER	2022-10-2





SMP ENGINEERING DATE: 2022-10-24 PERMIT NUMBER: P005622

PERMIT TO PRACTICE

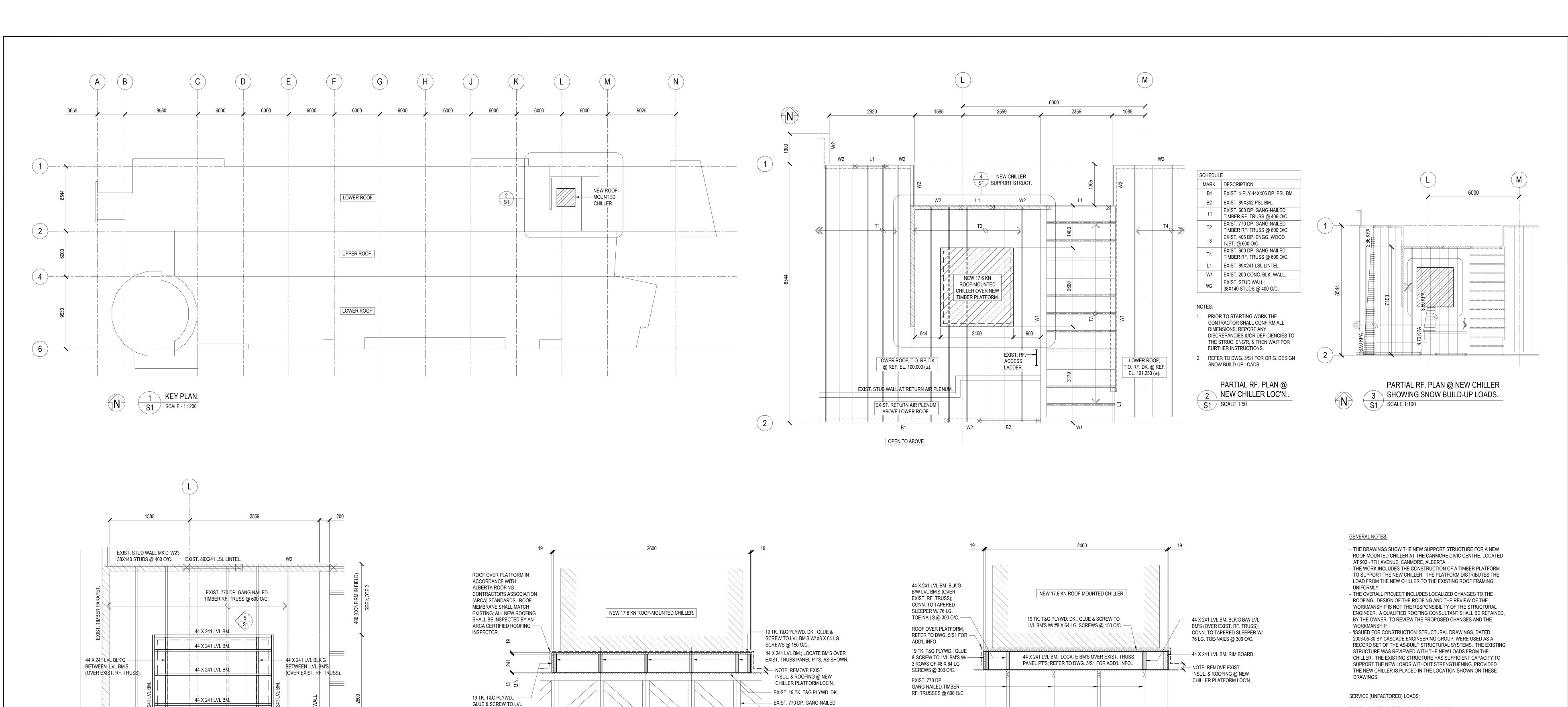
CANMORE CIVIC CENTRE COOLING UPGRADE

Drawing Title: **ELECTRICAL SPECIFICATIONS** 

2022-10-24 Designed By: **AS SHOWN** Engineer: 22-01-0095

Drawing Number

**E2.0** 



TIMBER RF. TRUSS @ 600 O/C.

BM'S W/ 3 ROWS OF

300 O/C.

44 X 241 LVL BM.

44 X 241 LVL BM.

(CONFIRM IN

NOTE 1)

1. LOCATE NEW CHILLER PLATFORM IN THE

LOCATE NORTH-SOUTH EXTENT OF NEW

CHILLER PLATFORM SUCH THAT THE NEW EAST-WEST RUNNING LVL BM'S ARE LOCATED

ABOVE PANEL POINTS IN EXIST. RF. TRUSSES

BELOW. REFER TO DWG. 5/S1 FOR ADD'L INFO..

EAST-WEST DIR'N SUCH THAT THE WEIGHT OF NEW CHILLER IS EQUALLY DISTRIBUTED TO NO LESS THAN FOUR EXIST. RF. TRUSSES.

FIELD, SEE

OUTLINE OF NEW 17.6 KN — ROOF-MOUNTED CHILLER

(CONFIRM IN

FIELD, SEE

PARTIAL PLAN SHOWING NEW

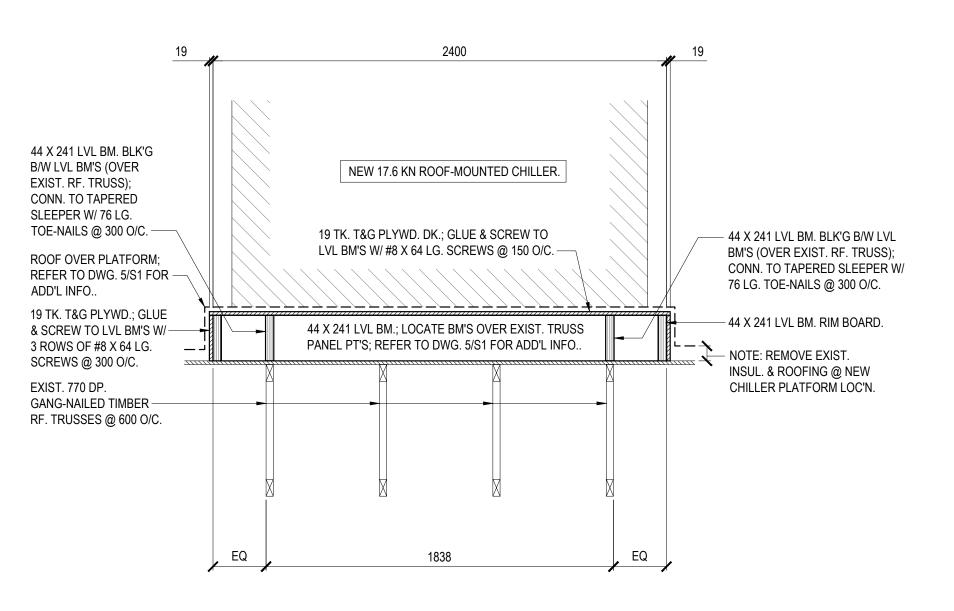
4 CHILLER SUPPORT STRUCTURE.

(OVER NEW TIMBER

SUPPORT STRUCT.).

#8 X 64 LG. SCREWS @

5 X-SECT. SHOWING NEW CHILLER SUPPORT STRUCT...
S1 SCALE 1:20



6 X-SECT. SHOWING NEW CHILLER SUPPORT STRUCT..
S1 SCALE 1:20

ROOF: SUPERIMPOSED DEAD LOAD = 0.72 KPA NEW CHILLER = 17.6 KN GROUND SNOW LOAD, Ss = 3.2 KPA ASSOCIATED RAIN LOAD, Sr = 0.1 KPA

IN ACCORDANCE WITH CLAUSE 4.1.6.7.(3) OF THE NATIONAL BUILDING CODE (2019 ALBERTA EDITION), THERE IS NO ADDITIONAL SNOW BUILD-UP AROUND THE NEW CHILLER.

# IMPORTANCE CATEGORY: HIGH

# GENERAL CONSTRUCTION REQUIREMENTS:

- THE CONTRACT DOCUMENTS CONSIST OF DRAWING S1. - PRIOR TO PROCEEDING WITH THE WORK, THE CONTRACTOR SHALL REVIEW THE DRAWING, TAKE THEIR OWN MEASUREMENTS OF THE AS-BUILT STRUCTURE, REPORT ANY DISCREPANCIES AND/OR DEFICIENCIES IN THE DRAWINGS TO THE STRUCTURAL ENGINEER, & THEN WAIT FOR FURTHER INSTRUCTIONS. - ALL CONSTRUCTION SHALL BE IN ACCORDANCE WITH GOOD CONSTRUCTION PRACTICE AND UNLESS SUPERSEDED BY THE CONTRACT DOCUMENTS SHALL COMPLY WITH ALL RELEVANT PROVISIONS OF THE NATIONAL BUILDING CODE (2019 ALBERTA EDITION).

- UNLESS NOTED OTHERWISE, ALL TIMBER FRAMING SHALL CONFORM TO PART 9 OF THE NATIONAL BUILDING CODE (2019 ALBERTA EDITION). - ALL EXISTING DIMENSIONAL LUMBER IS #1/#2 SPF. - ALL NEW DIMENSIONAL LUMBER SHALL BE #1/#2 SPF, OR BETTER. - ALL ENGINEERED WOOD BEAMS SHALL MEET OR EXCEED 2.0E LVL MATERIAL; MODULUS OF ELASTICITY = 2.0 X 10<sup>6</sup> PSI, FLEXURAL RESISTANCE, FB = 4800 PSI, AND A HORIZONTAL SHEAR RESISTANCE PARALLEL TO GRAIN, FV = 530 PSI. - ALL NEW BUILT-UP BEAMS SHALL BE FABRICATED FROM CONTINUOUS LAMINATIONS.

# STRUCTURAL REVIEW:

- THE STRUCTURAL ENGINEER SHALL REVIEW THE TIMBER FRAMING PRIOR TO THE INSTALLATION OF ANY INSULATION, PLYWOOD, OR ROOFING THAT MIGHT OBSTRUCT A VISUAL ASSESSMENT OF THE FINISHED PRODUCT. - THE CONTRACTOR WILL GIVE THE STRUCTURAL ENGINEER A MINIMUM OF 48 HOURS NOTICE PRIOR TO THE TIME SCHEDULED FOR THE INSPECTION(S).



D.C. DECHKA CONSULTING ENGINEERS LIMITED 27 Silverview Place N.W., Calgary, AB, T3B 3K5 Phone: (403) 710 - 8474 E-mail: shaback@dcdechka.com

VERIFY ALL DIMENSIONS, ELEVATIONS, AND DATUM; REPORT ANY ERRORS AND/OR DISCREPANCIES TO THE ENGINEER PRIOR TO

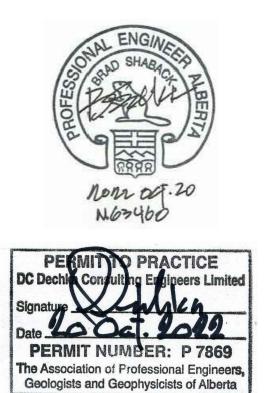
# ALL DRAWINGS REMAIN PROPERTY OF THE ENGINEER.

THIS DESIGN AND DRAWING MAY NOT BE REPRODUCED WITHOUT PERMISSION OF THE ENGINEER. DO NOT SCALE DRAWINGS.

# THIS DRAWING SUPERCEDES PREVIOUS ISSUES.

Revisions					
No.	Description	Date			
0	ISSUED FOR TENDER	2022-10-21			





CANMORE CIVIC CENTRE COOLING UPGRADE

STRUCTURAL KEY PLAN, PARTIAL PLANS **CROSS-SECTIONS & GENERAL NOTES** 

,	BS		2022-10-21
Designed By:	BS	Scale:	AS NOTE
Engineer:	BS	Job number:	22-117-30
Drawing Number			Rev. No.

Request for Quotation – Civic Centre Cooling System Replacement Reference Number: CAP 7227



# 8.0 APPENDIX B – SUPPLEMENTARY CONDITIONS FOR THE CCDC 2 (2020) CONTRACT

Name of Pro	ject: Elevation	Place Cooling	, Enhancements
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The following a	amendments are incorporated	d as Supplementary	Conditions to the A	Agreement made the
day of	, 20			

Where an Article, Definition or General Condition or paragraph thereof of the Agreement is completely deleted by these Supplementary Conditions, the numbering of the remaining General Conditions or paragraphs shall remain unchanged, and the numbering of the deleted item will be retained, unused.

#### **ARTICLE A-9 - CONFIDENTIALITY**

#### Add new Article A-9 - Confidentiality:

A9.1 The Contractor agrees to ensure that it shall, both during or following the term of the Contract, maintain the confidentiality and security of all Confidential Information and Personal Information, and that it shall not directly or indirectly disclose, destroy, exploit, or use any Confidential Information or Personal Information, except where required by law, without first obtaining the written consent of the Owner. The Contractor may disclose any portion of the Contract Documents or any other information provided to the Contractor by the Owner to any Subcontractor or Supplier if the Contractor discloses only such information as is necessary to fulfill the purposes of the Contract and the Contractor has included a commensurate confidentiality provision in its contract with the Subcontractor or Supplier. The Contractor acknowledges that it will comply with all requirements of the Personal Information Protection Protection Act, sa 2003, c P-6.5, as amended. The Contractor acknowledges that the Owner is bound by the provisions of the Freedom of Information and Protection of Privacy Act, RSA 2000, c f-25, as amended ("FOIPPA"). The Contractor further acknowledges that the Owner may be required to disclose any or all of the Confidential Information or Personal Information in the event that it is compelled to do so by law, through a request under FOIPPA or by the rules of any applicable regulatory authority.

#### **DEFINITIONS**

Add the following definitions:

#### **Confidential Information**

Confidential Information means all the information or material of the Owner that is of a proprietary or confidential nature, whether it is identified as proprietary or confidential or not, including but not limited to information and material of every kind and description (such as drawings and move-lists) which is communicated to or comes into the possession or control of the Contractor at any time.

Confidential Information shall not include information that:

- .1 is or becomes generally available to the public without fault or breach on the part of the Contractor, including without limitation breach of any duty of confidentiality owed by the Contractor to the Owner or to any third party, but only after that information becomes generally available to the public;
- the Contractor can demonstrate to have been rightfully obtained by the Contractor from a third party who had the right to transfer or disclose it to the Contractor free of any obligation of confidence;
- .3 the Contractor can demonstrate to have been rightfully known to or in the possession of the Contractor at the time of disclosure, free of any obligation of confidence; or
- .4 is independently developed by the *Contractor* without use of any *Confidential Information*.

#### **Personal Information**

Personal Information means personal information as that term is defined in the Freedom of Information and Protection of Privacy Act, and any and all personal health information of an individual, whether recorded in printed form, on film, by electronic means, or otherwise.

#### **Proper Invoice**

*Proper Invoice* for the purpose of this agreement means an invoice that complies with applicable *Payment Legislation* and which includes the following:

- .1 a breakdown of the invoice amount by trade or division as required by the specifications,
- .2 an updated schedule in a form and level of detail acceptable to the *Owner* showing the percentage complete on each task,
- .3 Worker's Compensation Board clearances showing current coverage,
- .4 a Statutory Declaration in the form of CCDC 9A 2018 for every invoice after the first invoice,
- .5 the Owner's and Contractor's full legal names,
- .6 the purchase order number, tax registration number and project number applicable to the *Work*,
- .7 the aggregate amount of holdbacks retained by the *Owner* under the *Contract* including the amount retained under the *Proper Invoice* and separately the amount of the holdbacks retained under and applicable to the *Proper Invoice*; and
- .9 No other invoice may be combined with the *Proper Invoice*.

#### **GC 1.1 CONTRACT DOCUMENTS**

Delete paragraph 1.1.3 in its entirety and substitute new paragraph 1.1.3:

- 1.1.3 The Contractor shall review the Contract Documents and shall report promptly to the Consultant any error, inconsistency or omission the Contractor may discover.
  - Such review by the *Contractor* shall be undertaken with the standard of care described in paragraph 3.9.1 of the *Contract*. Except for its obligation to make such review and report the result, the *Contractor* does not assume any responsibility to the *Owner* or to the *Consultant* for the accuracy of the *Contract Documents*. The *Contractor* shall not be liable for damage or costs resulting from such errors, inconsistencies, or omissions in the *Contract Documents*, which the *Contractor* could not reasonably have discovered through the exercise of the required standard of care. If the *Contractor* does discover any error, inconsistency, or omission in the *Contract Documents*, the *Contractor* shall not proceed with the work affected until the *Contractor* has received corrected or missing information from the *Consultant*.
  - If, at any time, the *Contractor* finds errors, omissions, or inconsistencies in the *Contract Documents* or has any doubt as to the meaning or intent of any part thereof, the *Contractor* shall immediately notify the *Consultant*, and request a *Supplemental Instruction, Change Order*, or *Change Directive*, as the case may require.
  - .3 Neither the Owner nor the Consultant will be responsible for the consequences of any action of the Contractor based on oral instructions.

Add new sentence to the end of paragraph 1.1.9:

"The Specifications are divided into divisions and sections for convenience but shall be read as a whole. Neither such division nor anything else contained in the Contract Documents will be construed to place responsibility on the Consultant to settle disputes among the Subcontractors and Suppliers or as between them and the Contractor with respect to such divisions."

#### **GC 1.3 RIGHTS AND REMEDIES**

Delete the word "No" from the beginning of paragraph 1.3.2 and substitute the words:

1.3.2 "Except with respect to the notice requirements set out in paragraphs 6.4.1, 6.5.4, and 6.6.1, no ...".

#### **GC 1.4 ASSIGNMENT**

Delete paragraph 1.4.1 in its entirety and substitute new paragraph 1.4.1:

1.4.1 The *Contractor* may not assign the *Contract* or a portion thereof without the consent of the *Owner*, and the granting of such consent shall be in the *Owner's* absolute discretion.

#### **GC 2.4 DEFECTIVE WORK**

Add new subparagraphs 2.4.1.1 and 2.4.1.2:

- 2.4.1.1 The Contractor shall rectify, in a manner acceptable to the Owner and the Consultant, all defective work and deficiencies throughout the Work, whether or not they are specifically identified by the Owner or the Consultant.
- 2.4.1.2 When applicable, the *Contractor* shall give priority to the correction of any defective work or deficiencies which the *Owner* determines adversely affect its day-to-day operations.

#### GC 3.1 CONTROL OF THE WORK

Add new paragraph 3.1.3 and 3.1.4:

- 3.1.3 Prior to commencing the *Work*, the *Contractor* shall verify, at the *Place of the Work*, all relevant measurements and levels necessary for the proper completion of the *Work* and shall further carefully compare such field measurements and conditions with the requirements of the *Contract Documents*. Where dimensions are not included or exact locations are not apparent in the *Contract Documents*, the *Contractor* shall immediately notify the *Consultant* in writing and obtain *Supplemental Instructions* from the *Consultant* before proceeding with any part of the affected *Work*.
- 3.1.4 The *Contractor* shall at all times perform the services required hereunder as diligently and expeditiously as is consistent with the highest professional standards and the orderly progress of the *Work*, and in accordance with the *Contract Time* and any revisions thereto, in order to maintain the desired development and construction schedule for the *Project*, and in order not to delay the *Work* or any project. The *Contractor* shall at all times provide sufficient personnel to accomplish its services within the time limits required by the *Owner*.

#### **GC 3.4 CONSTRUCTION SCHEDULE**

Add the following to paragraph 3.4.1.1 after the words "a construction schedule:

"as stipulated by the Contract Documents,"

Add the following subparagraph 3.4.1.4:

"provide the expertise, resources, labour and equipment, as are necessary to maintain progress under the current construction schedule accepted by the Owner,"

#### CCDC 2 - 2020 - STIPULATED PRICE CONTRACT

#### SUPPLEMENTARY CONDITIONS

Add new paragraphs 3.4.2 and 3.4.3:

- 3.4.2 If, at any time, it should appear to the *Owner* or the *Consultant* that the actual progress of the *Work* is behind schedule or is likely to become behind schedule, or if the *Contractor* has given notice of such to the *Owner* or the *Consultant* pursuant to subparagraph 3.4.1.3, the *Contractor* shall take appropriate steps to cause the actual progress of the *Work* to conform to the schedule or minimize the resulting delay and shall produce and present to the *Owner* and the *Consultant* a recovery plan demonstrating how the *Contractor* will achieve the recovery of the schedule. If the *Contractor* intends to apply for a change in the *Contract Price* in relation to a schedule recovery plan, then the *Contractor* shall proceed in accordance with General Condition 6.5 DELAYS.
- 3.4.3 The *Contractor* shall make allowance in the *Construction Schedule* for the implementation of the *Owner's* tenant improvements; the staged installation of the *Owner's* furniture, fixtures, and equipment; and the *Owner's* sequential occupancy, all in accordance with the *Owner's* Master Project Schedule.

#### **GC 3.5 SUPERVISION**

Delete paragraph 3.5.1 in its entirety and substitute new paragraph 3.5.1:

3.5.1 The *Contractor* shall provide all necessary supervision and appoint competent representatives who shall be in attendance at the *Place of the Work* while work is being performed. The appointed representatives shall not be changed except for valid reasons, and upon the *Contractor* obtaining the *Owner's* written consent, which consent will not be unreasonably withheld.

#### Add new paragraph 3.5.3:

3.5.3 The *Owner* may, at any time during the course of the *Work*, request the replacement of the appointed representative(s), where the grounds for the request involve conduct which jeopardizes the safety and security of the site or the *Owner*'s operations. Immediately upon receipt of the request, the *Contractor* shall make arrangements to appoint an acceptable replacement.

#### GC 3.6 SUBCONTRACTORS AND SUPPLIERS

<u>Delete</u> paragraph 3.6.3 in its entirety and <u>substitute</u> new paragraph 3.6.3:

3.6.3 The *Contractor* agrees not to change Subcontractors without the prior written approval of the *Owner*, which approval will not be unreasonably withheld.

#### **GC 3.7 LABOUR AND PRODUCTS**

Delete paragraph 3.7.3 and substitute with new paragraph 3.7.3:

3.7.3 Unless otherwise specified in the *Contract Documents*, *Products* provided shall be new and as specified. The *Contractor* shall not provide substitutions for specified *Products* without the express written consent of the *Consultant* and the *Owner*.

#### Add new paragraph 3.7.4:

3.7.4 The *Contractor* is responsible for the safe on-site storage of *Products* and their protection (including *Products* supplied by the *Owner* and other contractors to be installed under the *Contract*) in such ways as to avoid dangerous conditions or contamination to the *Products* or other persons or property and in locations at the *Place of the Work* to the satisfaction of the *Owner* and the *Consultant*. The *Owner* shall provide all relevant information on the *Products* to be supplied by the *Owner*.

#### GC 3.9 PERFORMANCE BY THE CONTRACTOR

Add new General Condition 3.9:

#### GC 3.9 PERFORMANCE BY CONTRACTOR

- 3.9.1 In performing its services and obligations under the *Contract*, the *Contractor* shall exercise the standard of care, skill, and diligence that would normally be provided by an experienced and prudent contractor supplying similar services for similar projects in Alberta. The *Contractor* acknowledges and agrees that throughout the *Contract*, the performance of the *Contractor's* obligations, duties, and responsibilities shall be judged against this standard. The *Contractor* shall exercise the same standard of care, skill, and diligence in respect of any *Products*, personnel, or procedures which it may recommend to the *Owner*.
- 3.9.2 The Contractor further represents, covenants and warrants to the Owner that:
  - .1 the personnel it assigns to the *Project* are appropriately experienced;
  - .2 it has a sufficient staff of qualified and competent personnel to replace any of its appointed representatives, subject to the *Owner's* approval, in the event of death, incapacity, removal or resignation; and
  - .3 there are no pending, threatened or anticipated claims that would have a material effect on the financial ability of the *Contractor* to perform its work under the *Contract*.

#### **GC 3.10 RIGHT OF ENTRY**

Add new General Conditions 3.10:

#### GC 3.10 RIGHT OF ENTRY

3.10.1 The *Owner* shall have the right to enter or occupy the *Work* in whole or in part for the purpose of placing fittings and equipment or for other uses before *Substantial Performance of the Work or Ready-for-Takeover*, if, in the reasonable opinion of the *Consultant* and *Contractor*, such entry or occupation does not prevent or substantially interfere with the *Contractor's* completion of the *Contract* within the *Contract Time*. Such entry or occupation shall not be considered as acceptance of the *Work* or in any way relieve the *Contractor* from responsibility to complete the *Contract*.

#### **GC 4.1 CASH ALLOWANCES**

Add new paragraph 4.1.8:

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 5.1 FINANCING INFORMATION REQUIRED OF THE OWNER

Revise the heading, "GC 5.1 FINANCING INFORMATION REQUIRED OF THE OWNER" to read: "GC 5.1 FINANCING INFORMATION REQUIRED".

Delete paragraph 5.1.1 in its entirety and substitute new paragraph 5.1.1:

5.1.1 The *Owner* and *Contractor* shall provide each other with timely *Notice in Writing* of any material change in their financial ability to fulfil their respective obligations under the *Contract*.

Delete paragraph 5.1.2 in its entirety.

#### GC 5.2 APPLICATIONS FOR PAYMENT

Add to the end of paragraph 5.2.8 the following new sentence:

"Any *Products* delivered to the *Place of the Work* but not yet incorporated into the *Work* shall remain at the risk of the *Contractor* notwithstanding that title has passed to the *Owner* pursuant to General Condition 14.1 - OWNERSHIP OF MATERIALS."

#### **GC 5.3 PAYMENT**

#### Add new paragraph 5.3.2:

5.3.2 The *Owner* may retain a reasonable amount from any progress payment for the value of deliverables that are required under the *Contract* but have not been delivered as of the invoice date.

#### Add new paragraph 5.3.3:

5.3.3 The *Owner* may retain an amount equal to 2% from each amount claimed under General Condition 5.2 pending confirmation from the *Consultant* of there being no deficiencies with the deliverables received by the Owner in relation to the Contractor's claim for payment.

#### Add new paragraph 5.3.4:

5.3.4 The holdback for undelivered Work in GC 5.3.2 and the holdback for deficiencies provided in GC 5.3.3 shall be separate from any holdback for the purpose of lien legislation or Payment Legislation provided by GC 5.4.

#### GC 5.4 SUBSTANTIAL PERFORMANCE OF THE WORK AND PAYMENT HOLDBACK

#### Add new paragraph 5.4.7:

- 5.4.7 Together with the submission of its written application for *Substantial Performance of the Work*, the *Contractor* shall submit to the *Consultant* and to the *Owner* a statutory declaration setting forth in reasonable detail any then outstanding and unresolved disputes or claims between the *Contractor* and any *Subcontractor* or *Supplier*, including any claims allegedly arising from delay, which are, directly or indirectly, related to any then outstanding or anticipated disputes or claims between the *Contractor* and the *Owner*, and this disclosure shall, at a minimum:
  - .1 identify the parties involved;
  - .2 identify the amount in dispute;
  - .3 provide a brief statement summarizing the position of each party;
  - .4 include copies of any correspondence or documents in support of either party's position;
  - .5 include copies of any documents of any court or arbitration process related to the matter;
  - 6 identify the dispute or claim between the Contractor and the Owner to which the matter relates; and
  - .7 include a copy of any written agreement or a summary of any oral agreement between the parties related to resolution of the matter.

The disclosure requirements detailed herein are of a continuing nature and survive completion of the *Work*. Accordingly, the *Contractor* shall supplement the information provided with the original statutory declaration with additional materials pertaining to new or existing disputes or claims, as they become available.

#### **GC 5.5 FINAL PAYMENT**

<u>Delete</u> from the first line of paragraph 5.5.2 the words, "calendar days" and <u>substitute</u> the words: "Working Days".

<u>Delete</u> from paragraph 5.5.4 the words, "calendar days" and <u>substitute</u> the words:

"Working Days".

#### Add new paragraph 5.5.5:

5.5.5 Notwithstanding 5.5.4, the *Owner* shall retain a lien holdback on the finishing work in accordance with the lien legislation applicable to the *Place of the Work*, which shall become due in accordance with 5.4.3 and the *Contractor* shall submit an application for payment of the lien holdback amount for the finishing work in accordance with 5.4.4.

#### GC 6.1 OWNER'S RIGHT TO MAKE CHANGES

Add the following to paragraph 6.1.2:

"All such changes require approval by a representative of the Owner with proper signing authority."

#### **GC 6.2 CHANGE ORDER**

Delete paragraph 6.2.1 in its entirety and substitute new paragraph 6.2.1:

- 6.2.1 When a change in the *Work* is proposed or required, the *Consultant* shall provide the *Contractor* with written description of the proposed change in the *Work*. The *Contractor* shall promptly present, in a form acceptable to the *Consultant*, a method of adjustment or an amount of adjustment for the *Contract Price*, if any, and the adjustment in the *Contract Time*, if any, for the proposed change in the *Work*. The *Contractor* shall also provide the following:
  - .1 The method of adjustment or an amount of adjustment for the *Contract Price*, if any, and the adjustment in the *Contract Time*, from the *Subcontractors* on the *Subcontractors*' letterhead.
  - .2 Quotations submitted by the Subcontractors and the Contractor shall have a complete breakdown for all items of material, a total number of hours for labour, and a dollar rate applied against individual material items and labour quantities."

Delete from line 1 of Paragraph 6.2.2 "or to the method to be used to determine the adjustments".

#### Add the following paragraphs:

- 6.2.3 Unit prices included in the *Contract*, or prices pro rata thereto, will be used in the first instance in pricing changes.
- 6.2.4 Where work is added pursuant to GC 6.2 *Change Order* or GC 6.3 *Change Directive*, the *Contract Price* shall be increased only by the net actual value of the work added including taxes, but excluding *Value Added Taxes*, plus the following, identified and applied separately:
  - .1 Contractor's mark-up on work by its own forces:

Overhead: 7% Profit: 5%

.2 Contractor's mark-up on Subcontractor's work:

Overhead: 5% Profit: 5%

.3 Subcontractor's mark-up on its own work:

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#### SUPPLEMENTARY CONDITIONS

Overhead: 7% Profit: 5%

- 6.2.5 The Contractor's overhead includes without limitation all site and head office costs including head office personnel, insurance and bonding (except where additional bonding is at the Owner's expense pursuant to paragraph 11.2.3), traveling costs, financing costs including those related to holdback; the salaries, premiums for overtime or shift time unless otherwise approved by the *Owner* in writing prior to the *Work* being performed, and other miscellaneous employee benefits of superintendents and sub-trade superintendence, engineers, timekeepers, accountants, clerks, watch persons and security, office administration; processing correspondence, changes, shop drawings, engineering, As-Built Drawings, maintenance manuals and all other documents required to be provided prior to certification of Substantial Performance of the Work, costing and accounting, payroll, technical staff, and all other site supervision staff above foreperson employed directly on the Work; coordination with other trades affected, use of temporary offices, plant, tools and equipment including operators, sheds, storage compounds and other general temporary site support facilities and all utilities used therein; first aid, safety and protection measures, including training; licences and permits; scheduling; temporary protection; daily clean up; disposal; garbage chute; scaffolding; hoisting and unloading; commissioning; cutting and patching, and shall be applied to both extras and credits equally.
- 6.2.6 Labour costs shall be the actual, prevailing rates at the *Place of Work* paid to the workers, plus payroll burdens, where payroll burdens are limited to payments in respect of the employer contribution to workers compensation payments, vacation pay, employment insurance premiums, sickness and accident insurance and pension fund contributions.
- 6.2.7 Quotations for changes to the *Work* shall be accompanied by itemized breakdowns together with detailed, substantiating quotations or cost vouchers from *Subcontractors* and *Suppliers*.
- 6.2.8 Unit and alternative prices included in the *Contract* include supply, installation, *Products*, equipment, services, materials, labour, Overhead, profit and taxes, but exclude Value Added Taxes.
- 6.2.9 The *Owner*, through the *Consultant*, reserves the right to authorize payment for changes in the *Work* by means of cash allowance disbursement authorizations.
- 6.2.10 When both additions and deletions covering related work or substitutions are involved in a change to the Work, payment, including overhead and profit, shall be calculated on the basis of the net difference, if any, with respect to that change in the *Work*.
- 6.2.11 If any change or deviation in, or omission from the *Work* is made by which the amount of Work to be performed is decreased, or if the whole or a portion of the *Work* is dispensed with, no compensation is claimable by the *Contractor* for any loss of anticipated profit in respect thereof.

#### **GC 6.3 CHANGE DIRECTIVE**

<u>Amend</u> paragraph 6.3.6 by deleting subparagraphs 6.3.6.1 to 6.3.6.3 inclusive and amending the preamble so that it reads:

"The adjustment to the *Contract Price* for a change carried out by way of *Change Directive* shall be determined on the basis of the net costs of the *Contractor's* actual expenditures and savings attributable to the *Change Directive* valued in accordance with paragraph 6.3.7 and paragraph 6.1.4"

#### Add the following to 6.3.7.1(2):

"...and carrying out the change in the Work, including necessary supervisory services;"

Delete subparagraph 6.3.7.1(3) and replace it with:

"(3) intentionally left blank."

Delete subparagraphs 6.3.7.13, 6.3.7.17, 6.3.7.18 and 6.3.7.19 and replace with 'intentionally left blank"

#### GC 6.4 CONCEALED OR UNKNOWN CONDITIONS

Add new paragraph 6.4.5:

6.4.5 If the *Contractor* was given access to the *Place of the Work* prior to the submission of the bid on which the *Contract* was awarded, then the *Contractor* confirms that it carefully investigated the *Place of the Work* and, in doing so, applied to that investigation the degree of care and skill required by paragraph 3.9.1. In those circumstances, notwithstanding the provisions of paragraph 6.4.1, the *Contractor* is not entitled to an adjustment to the *Contract Price* or to an extension of the *Contract Time* for conditions which could reasonably have been ascertained by the *Contractor* by such careful investigation, or which could have been reasonably inferred from the material provided with the *Contract Documents*. In those circumstances, should a claim arise, the *Contractor* will have the burden of establishing that it could not have discovered the materially different conditions from a careful investigation because of restrictions placed on its access or inferred the existence of the conditions from the material provided with the *Contract Documents*.

#### GC 6.5 DELAYS

<u>Delete</u> the period at the end of paragraph 6.5.1, and <u>substitute</u> the following words:

", but excluding any consequential, indirect or special damages."

Amend the last sentence of paragraph 6.5.2 to read:

"The Contractor shall be reimbursed by the Owner for the Contractor's actual, direct costs necessarily incurred by the Contractor as a result of the delay subject to, and in accordance with, the provisions of GC 6.5.5."

#### Add the following paragraphs:

- 6.5.6 If the *Contractor* is delayed in the performance of the *Work* by an act or omission of the *Contractor* or anyone employed or engaged by the *Contractor* directly or indirectly, or by any cause within the *Contractor's* control, then, subject to GC 3.4.2 of GC 3.4 CONSTRUCTION SCHEDULE, the *Contract* Time may be extended for such reasonable time as the *Consultant* may decide in consultation with the *Contractor*. The *Owner* shall be reimbursed by the *Contractor* for all reasonable costs incurred by the *Owner* as the result of such delay, including all services required by the *Owner* from the *Consultant* as a result of such delay by the *Contractor* and, in particular, the cost of the *Consultant's* services during the period between the *Ready-For-Takeover* date stated in paragraph 1.3 of Article A-1 THE WORK herein as the same may be extended through the provisions of these General Conditions and any later, actual *Ready-For-Takeover* date achieved by the *Contractor*.
- 6.5.7 During any suspension of the *Work* or any construction or building operations, for whatever reason, the *Contractor* shall maintain adequate surveillance of the *Work* and undertake such maintenance and protection of the *Work* as may be necessary to maintain health and safety and, when possible, to protect *Products*, materials, plant and equipment already installed in the *Work* or delivered to the *Place of the Work*. The *Contractor* shall be responsible for the security, care, maintenance and protection of the *Work* in the event of any such shut down or interruption in the performance of the *Work*.
- 6.5.8 If the *Contractor* is delayed in the performance of the *Work* by an act or omission of the *Contractor* or anyone for whom the *Contractor* is responsible, then the *Contractor* shall be responsible to put in place any scheduled recovery plan to recover and prevent lost time in accordance with paragraph 3.4.2 of GC 3.4 CONSTRUCTION SCHEDULE.

# GC 7.1 OWNER'S RIGHT TO PERFORM THE WORK, TERMINATE THE CONTRACTOR'S RIGHT TO CONTINUE WITH THE WORK OR TERMINATE THE CONTRACT.

<u>Delete</u> paragraph 7.1.6 and substitute the following:

7.1.6 In addition to its right to terminate the *Contract* set out herein, the *Owner* may terminate the *Contract* at any time for any other reason or no reason and without cause upon giving the *Contractor* THIRTY (30) days notice through a *Notice in Writing* which shall include the date on which the *Contract* is terminated. In such event, the *Contractor* shall be entitled to be paid for all *Work* performed including reasonable profit, for loss sustained upon *Products* and *Construction Equipment* as a result of the termination of the *Contract*, but in no event shall the Contractor be entitled to be compensated for any loss of profit on unperformed portions of the *Work*, or any indirect, special, or consequential damages in relation to termination of the *Contract*.

#### Add the following new paragraphs:

- 7.1.7 The Owner may suspend Work under this Contract at any time for any reason or no reason and without cause upon providing the Contractor with Notice in Writing to that effect. In such event, the Contractor shall be entitled to be paid for all Work performed to the date of suspension and be compensated for all actual costs incurred arising from the suspension, including reasonable profit, for loss sustained upon Products and Construction Equipment as a result of the suspension of the Work, but in no event shall the Contractor be entitled to be compensated for any indirect, special, or consequential damages in relation to the suspension of the Work. In the event that the suspension continues for more than 180 calendar days, the Contract shall be deemed to be terminated and the provisions of paragraph 7.1.6 shall apply.
- 7.1.8 In the case of either a termination of the *Contract*, or a suspension of the *Work* under General Condition 7.1 OWNER'S RIGHT TO PERFORM THE WORK, TERMINATE THE CONTRACTOR'S RIGHT TO CONTINUE WITH THE WORK OR TERMINATE THE CONTRACT or General Condition 7.2 CONTRACTOR'S RIGHT TO SUSPEND THE WORK OR TERMINATE THE CONTRACT, the *Contractor* shall use its best commercial efforts to mitigate the financial consequences to the Owner arising out of the termination or suspension, as the case may be.
- 7.1.9 Upon the resumption of the *Work* following a suspension under General Condition 7.1 OWNER'S RIGHT TO PERFORM THE WORK, TERMINATE THE CONTRACTOR'S RIGHT TO CONTINUE WITH THE WORK OR TERMINATE THE CONTRACT or General Condition 7.2 CONTRACTOR'S RIGHT TO SUSPEND THE WORK OR TERMINATE THE CONTRACT, the *Contractor* will endeavour to minimize the delay and financial consequences arising out of the suspension.
- 7.1.10 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 or suspension shall continue after such termination of the *Contract* or suspension of the *Work*.
- 7.1.11 Without limiting the foregoing in this section, a finding on a security check that is incompatible with ensuring the achievement of any of the following objectives is a security problem and may be justification for termination if not corrected:
  - (a) the Contractor's ability to provide the Work in accordance with the Contract:
  - (b) the safety of the *Owner's* directors, officers, appointees, employees, agents or consultants, as well as the *Contractor's* directors, officers, employees, agents, consultants or *Subcontractors*, the *Owner's* clients and their directors, officers, appointees, employees, agents, consultants or subcontractors, as well as any *Subcontractor's* directors, officers, employees, agents, consultants or sub-subcontractors, and the public;
  - (c) the reputation of or public confidence in the Owner;
  - (d) the security of the *Owner's* financial assets and revenue;
  - (e) the security of any real property owned, controlled or managed by the Owner;
  - (f) the security of any other property owned, controlled, managed or licensed by the Owner;
  - (g) the security, confidentiality or integrity of the Owner's Confidential Information and the integrity of any other materials held by the Owner.

#### GC 7.2 CONTRACTOR'S RIGHT TO SUSPEND THE WORK OR TERMINATE THE CONTRACT

<u>Delete</u> paragraph 7.2.2 in its entirety.

Delete subparagraph 7.2.3.1 in its entirety.

Delete subparagraph 7.2.3.3 in its entirety and substitute new subparagraph 7.2.3.3:

7.2.3.3 the *Owner* fails to pay the *Contractor* when due the amount certified by the *Consultant* or awarded by arbitration or a court, except where the *Owner* has a bona fide claim for set off, or

Delete from subparagraph 7.2.3.4, the words:

, except for General Condition 5.1 - FINANCING INFORMATION REQUIRED OF THE OWNER,

<u>Delete</u> from the end of paragraph 7.2.4 the words "or terminate the *Contract*" and <u>substitute</u> the words:

7.2.4 "until the default is corrected, provided, however, that in the event of such suspension, the provisions of subparagraph 7.1.10 shall apply. If the *Contractor's Notice in Writing* to the *Owner* was given pursuant to subparagraph 7.2.3.3, then, 60 days after the delivery of the *Notice in Writing*, the *Contractor* may terminate the *Contract*, provided, however, that in the event of such termination, the provisions of subparagraph 7.1.10 shall apply.

#### **GC 8.1 AUTHORITY OF THE CONSULTANT**

<u>Delete</u> last sentence of 8.1.3 and <u>substitute</u> the following sentence:

"If it is subsequently determined that such instructions were 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 the requirements of the *Contract Documents*, including costs resulting from interruption of the *Work*."

#### GC 8.3 NEGOTIATION, MEDIATION AND ARBITRATION

Delete paragraphs 8.3.6, 8.3.7 and 8.3.8 in their entirety and substitute new paragraph 8.3.6:

8.3.6 When a dispute has not been resolved through negotiation or mediation, within 10 *Working Days* after the date of termination of the mediated negotiations under paragraph 8.3.5, either party may give a *Notice in Writing* to the other party and to the *Consultant* inviting the other party to agree to submit the dispute to be finally resolved by arbitration, pursuant to provisions of the *Arbitration Act*. If the other party wishes to accept the invitation to submit the dispute to arbitration, it shall so indicate by the delivery of a responding *Notice in Writing* within 10 *Working Days* of receipt of the invitation. If, within the required times, no invitation is made or, if made, is not accepted, either party may refer the dispute to the courts or to any other form of dispute resolution, including arbitration, which the parties may agree to use.

Add the following new paragraphs 8.3.9, 8.3.10, 8.3.11, 8.3.12., 8.3.13., and 8.3.14.

- 8.3.9 Within five days of receipt of the notice of arbitration by the responding party under paragraph 8.3.6, the *Owner* and the *Contractor* shall give the *Consultant* a written notice containing:
  - (a) a copy of the notice of arbitration
  - (b) a copy of supplementary conditions 8.3.9 to 8.3.14 of this *Contract*, and;
  - (c) any claims or issues which the *Contractor* or the *Owner*, as the case may be, wishes to raise in relation to the *Consultant* arising out of the issues in dispute in the arbitration
- 8.3.10 The *Owner* and the *Contractor* agree that the *Consultant* may elect, within ten days of receipt of the notice under paragraph 8.3.9, to become a full party to the arbitration under paragraph 8.3.6 if the *Consultant*:

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- (a) has a vested or contingent financial interest in the outcome of the arbitration;
- (b) gives the notice of election to the *Owner* and the *Contractor* before the arbitrator is appointed;
- (c) agrees to be a party to the arbitration within the meaning of the rules referred to in paragraph 8.3.6, and,
- (d) agrees to be bound by the arbitral award made in the arbitration.
- 8.3.11 If an election is made under paragraph 8.3.10, the *Consultant* may participate in the appointment of the arbitrator and, notwithstanding the rules referred to in paragraph 8.3.6, the time period for reaching agreement on the appointment of the arbitrator shall begin to run from the date the 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:
  - (a) on application of the *Owner* or the *Contractor*, determine whether the *Consultant* has satisfied the requirements of paragraph 8.3.10, and;
  - (b) make any procedural order considered necessary to facilitate the addition of the *Consultant* as a party to the arbitration.
- 8.3.13 The provisions of paragraph 8.3.9 shall apply mutatis mutandis to written notice to be given by the *Consultant* to any sub-consultant;
- 8.3.14 In the event of notice of arbitration given by the *Consultant* to a sub-consultant, the sub-consultant is not entitled to any election with respect to the proceeding as outlined in 8.3.10, and is deemed to be bound by the arbitration proceeding.

#### **GC 9.1 PROTECTION OF WORK AND PROPERTY**

<u>Delete</u> subparagraph 9.1.1.1 in its entirety and <u>substitute</u> new subparagraph 9.1.1.1:

"9.1.1.1 errors or omissions in the *Contract Documents* which the *Contractor* could not have discovered applying the standard of care described in paragraph 3.9.1;"

#### Delete paragraph 9.1.2 in its entirety and substitute the following new paragraph 9.1.2:

9.1.2 Before commencing any *Work*, the *Contractor* shall take all necessary steps to determine the locations of all underground utilities and structures. Without limitation, necessary steps shall include reference to the *Contract Documents*, making an inspection of the *Place of the Work*, reviewing land title registrations, using public and private utility locating services, and exercising the degree of care and skill described in paragraph 3.9.1. The Owner makes no representation or warranty as to the accuracy or correctness of utility locations in the *Contract Documents*.

#### Add new paragraph 9.1.5:

9.1.5 With respect to any damage to which paragraph 9.1.4 applies, the *Contractor* shall neither undertake to repair or replace any damage whatsoever to the work of other contractors, or to adjoining property, nor acknowledge that the same was caused or occasioned by the *Contractor*, without first consulting the *Owner* and receiving written instructions as to the course of action to be followed from either the *Owner* or the *Consultant*. Where, however, there is danger to life, the environment, or public safety, the *Contractor* shall take such emergency action as it deems necessary to remove the danger."

#### Add new paragraph 9.1.6:

9.1.6 The Contractor shall be responsible for securing the Place of Work at all times and shall take all reasonable precautions necessary to protect the Place of Work, its contents, materials (including Owner-supplied materials) and the public from loss or damage during and after working hours. Where the Consultant or the Owner deems the provision of security guard services to be necessary, the Contractor shall provide those services at the Owner's expense."

#### GC 9.2 TOXIC AND HAZARDOUS SUBSTANCES

Add\_new subparagraph 9.2.5.5

9.2.5.5 take all reasonable steps to mitigate the impact on Contract Time and Contract Price.

Add to paragraph 9.2.6 after the word "responsible", the following new words:

"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 legal and regulatory requirements) 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,"

Add to paragraph 9.2.8 after the word "responsible", the following new words:

"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 legal and regulatory requirements) 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**

Add new paragraphs 9.4.6:

9.4.6 The *Contractor* shall indemnify and save harmless the *Owner*, its agents, officers, directors, employees, consultants, successors, appointees, and assigns from and against the consequences of any and all safety infractions committed by the *Contractor* under the *Occupational Health and Safety Act*, including the payment of legal fees and disbursements on a solicitor and client basis. Such indemnity shall apply to the extent to which the *Owner* is not covered by insurance, provided that the indemnity contained in this paragraph shall be limited to costs and damages resulting directly from such infractions and shall not extend to any consequential, indirect or special damages.

#### GC 9.5 MOULD

Add to subparagraph 9.5.2.3 immediately before the comma, the following new words:

"and as a result of the delay"

#### **GC 10.1 TAXES AND DUTIES**

Add new paragraph 10.1.3:

10.1.3 Where the *Owner* is entitled to an exemption or a recovery of sales taxes, customs duties, excise taxes or *Value Added Taxes* applicable to the *Contract*, the *Contractor* shall, at the request of the *Owner*, assist with application for any exemption, recovery or refund of all such taxes and duties and all amounts recovered or exemptions obtained shall be for the sole benefit of the *Owner*. The *Contractor* agrees to endorse over to the *Owner* any cheques received from the federal or provincial governments, or any other taxing authority, as may be required to give effect to this paragraph.

#### GC 10.2 LAWS, NOTICES, PERMITS AND FEES

<u>Delete</u> from the first line of paragraph 10.2.5 the word, "The" and <u>substitute</u> the words:

"Subject to paragraph 1.1.3 and 3.9.1, the".

#### **GC 10.4 WORKERS' COMPENSATION**

Add new paragraph 10.4.2 as follows:

10.4.2 The *Contractor* shall ensure that each *Subcontractor* complies with the workers' compensation legislation at the *Place of the Work* and that all *Subcontractors* purchase worker's compensation coverage, whether or not required to do so under the applicable legislation."

Add new paragraph 10.4.3 as follows:

10.4.3 Where a *Subcontractor* is not required to participate in the insurance plan provided for under the workers' compensation legislation, the *Contractor* shall require the *Subcontractor* to provide a sworn declaration of its exemption as a condition of the *Subcontractor*'s admission to the *Place of Work*. When requested by the *Owner*, the *Contractor* shall require the *Subcontractor* to provide a letter of exemption under the workers' compensation legislation."

#### **GC 11.1 INSURANCE**

Add to the end of paragraph 11.1.1.2 the following new words:

11.1.1.2 "In addition, this policy shall include coverage for non-owned automobiles."

Add the following words at the end of 11.1.1.8:

", with an aggregate limit of not less than \$5 million within any policy year, and shall be in the joint names of the *Contractor* and the *Owner*."

Delete paragraph 11.1.2 in its entirety and substitute new paragraph 11.1.2:

11.1.2 Each of the policies of insurance shall also contain a provision requiring not less than 30 days' written notice to each named insured prior to cancellation or any change that would reduce coverage. At least 10 calendar days prior to commencement of the *Work* and upon any 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*."

#### **GC 12.1 READY-FOR-TAKEOVER**

Add new sentence 12.1.1.9 as follows:

.9 Provision of a schedule, acceptable to the Consultant, giving reasonable dates for finishing the Work and correcting deficiencies."

#### **GC 12.3 WARRANTY**

Delete from the first line of paragraph 12.3.2 the word, "The" and substitute the words:

"Subject to paragraph 3.9.1, the . . . "

#### **GC 13.2 WAIVER OF CLAIMS**

Delete the reference to "395 calendar days" in paragraph 13.2.2.2 and substitute

"120 calendar days".

Delete the last sentence of subparagraph 13.2.3.4 and substitute:

"Substantial defects or deficiencies" mean those defects or deficiencies in the *Work* where the reasonable cost of repair of such defects or deficiencies exceeds \$50,000 but, in any event, a defect or deficiency in the *Work* which affects 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* shall be deemed to be a "substantial defects or deficiencies" regardless of the cost of repair.

#### **NEW PART 14**

Add new PART 14 as follows:

#### **PART 14 OTHER PROVISIONS**

Add new GC14.1 as follows:

#### **GC 14.1 OWNERSHIP OF MATERIALS**

14.1.1 All Work and Products delivered to the Place of the Work by the Contractor shall be the property of the Owner. The Contractor shall remove all surplus or rejected materials when notified in writing to do so by the Consultant.

Add new GC14.2 as follows:

#### **GC 14.2 CONSTRUCTION LIENS**

- 14.2.1 In the event that a claim for lien is registered against the *Project* by a *Subcontractor* or *Supplier*, and provided the *Owner* has paid all amounts properly owing under the *Contract*, then the *Contractor* shall, at its own expense:
  - .1 within 10 calendar days, ensure that any and all claims for lien and certificates of action are discharged, released, or vacated by the posting of security or otherwise; and
  - .2 in the case of written notices of lien, ensure that such notices are withdrawn, in writing.
- 14.2.2 In the event that the *Contractor* fails to conform with the requirements of paragraph 14.2.1, the *Owner* may fulfil those requirements without *Notice in Writing* to the *Contractor* and set off and deduct from any amount owing to the *Contractor*, all costs and associated expenses, including the costs of posting security and all legal fees and disbursements associated with discharging or vacating the claim for lien or certificate of action and defending the action. If there is no amount owing by the *Owner* to the *Contractor*, then the *Contractor* shall reimburse the *Owner* for all of the said costs and associated expenses.

Add new GC14.3 as follows:

#### GC 14.3 CONTRACTOR DISCHARGE OF LIABILITIES

14.4.1 In *addition* to the obligations assumed by the *Contractor* pursuant to General Condition 3.6 – SUBCONTRACTORS AND SUPPLIERS, the *Contractor* agrees to discharge all liabilities incurred by it for labour, materials, services, *Subcontractors* and *Products*, used or reasonably required for use in the performance of the *Work*, except for amounts withheld by reason of legitimate dispute which have been identified to the party or parties, from whom payment has been withheld.

#### **END OF SUPPLEMENTARY CONDITIONS**